

SAGAMORE HILL LIGHTING MASTER PLAN



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New York, New York

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INTRODUCTION

1.0 EXECUTIVE SUMMARY

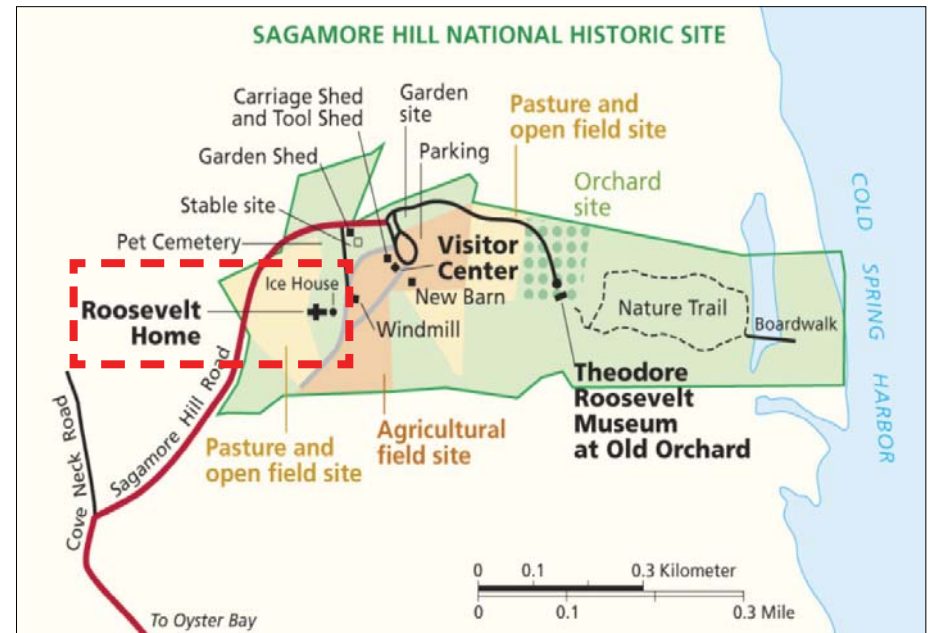
In summer 2010, we were invited by John G. Waite Associates to assist in the preparation of a Lighting Master Plan for the Theodore Roosevelt Home and exterior facade for the National Park Service. The Plan scope is to address interior visibility issues and collection management concerns while improving the exterior appearance of the house in a manner that best complies with good sustainable practice and energy conservation. Scope area also includes the path to the house from the Visitors Center and the Visitors Center parking lot.

The fact-finding process included a trip to the site to observe current lighting conditions, record light levels and review current choice of sources and maintenance techniques. We also discussed various issues with curators, docents and facilities personnel; reviewed historic documents and discuss the upgrade plans with the Architects.

We observed that most of the public rooms in the house were lighted quite well but areas where interior finishes were dark, the low illumination level combined with the bright windows resulted in disabling glare and very low visibility. This was most notable in the Entry Hall and North Room.

While the house was not viewed after dark, it was apparent that the current exterior house façade lighting scheme can be improved by upgrading to high color rendering sources and more sympathetic light fixture locations.

Our goal in this report is to provide actionable lighting guidelines for future reference as funding for lighting upgrades become available.



SITE MAP

2.0 PROCESS

1. The process began with Fisher Marantz Stone (FMS) visiting the site on 18 October 2010 and met with the following individuals to discuss the various functions and operations of the Home as well as how these areas function.

Amy Verone – Chief of Curatorial Services

Susan Sarna - Curatorial Staff

Bo Stein – Facilities Maintenance

Sean Garrett - Interpretative Staff

2. We reviewed prior survey documents including the Plus Group Sagamore Hill Site Report, SAHI HSR Addendum 08-2010 chapters on Electrical lighting and Illuminating Gas.
3. During our site visit, we reviewed the existing parking lot, pedestrian paths leading from the Visitors center to the House, exterior floodlight fixtures surrounding the House. Inside, we walked the entire house from the basement to the attic, noting the light fixtures, electrical panels and timers, as well as the daylighting conditions as they shifted over the course of the day.
4. Illuminance levels were measured with a Minolta T-10 Illuminance meter and approximately two hundred fifty photos taken.
5. FMS presented a summary draft of the report to the National Park Service on 3 December 2010, collected comments and issued a Preliminary Report to the team on 23 December 2010. Final comments were solicited in preparation for a final document issue to follow.
6. Bibliography of reference materials is included in Appendices at the rear of the report.

3.0 GOALS

1. Maintain a quality of electric illumination, for interpretive reasons, that evokes the period of Theodore Roosevelt's death.
2. Improve the nighttime exterior image of the house to address both aesthetic and security needs.
3. Improve the Visitor visibility within the house in areas where the high contrast between bright windows and very dark room finishes compromise the visual experience.
4. Improve the long term sustainability of the lighting systems in regard to maintenance and energy use through the use of an updated control system.

|| OBSERVATIONS

1.0 EXTERIOR

1.1 GENERAL

1. Survey was performed from approximately 10 AM through 4 PM on a mostly clear day that clouded over later in the afternoon.
2. Awnings were still in place (in the lowered position) for the west facing windows in the North Room and south facing windows in the Parlor and Library.
3. Site is little used after dark so building floodlighting mostly serves security purposes for the local police,

1.2 SITE

1. The only Site lighting observed was a single pole mounted floodlight at the west end of the Visitors parking lot.
2. It was explained that additional site lighting is being considered for both the parking lot and path(s) leading from the Visitor center to the house.



BIRD'S EYE VIEW OF SAGAMORE HILL



WOODEN POST AND RAIN FENCE



PATH TO ROOSEVELT HOME



VISITOR CENTER



VIEW NW TO HOUSE

1.3 HOUSE FACADE

1. Current house floodlighting consists of four ground mounted high pressure sodium floodlights located far back from the house, and an additional fixture lighting the drive to the house.
2. Floodlighting effect is unflattering due to both the poor color rendering and orange color of the sodium lamps lighting the largely blue and grey color scheme of the house.
3. Floodlight locations also contribute to a less than flattering night time appearance of the House.
4. Ground mounted fixture located within the drive circle of the Porte Cochere produces large shadows on the house from the projection of the Porte Cochere.
5. Other three floodlights, also mounted close to the ground casts much light on the ground and creates second floor shadows. These shadows are less when the fixtures are located further from the house but these tend to flatten the architectural features.
6. The porte cochere has one semi-recessed lensed light fixture outside the front door (only) which was not lighted during our visit.
7. Porches have vitually no external lighting, the exception being an unresolved location on the west porch.
8. Lights are controlled by time clock and are in use from dusk to dawn. Timer clocks are not astronomical and need to be reset seasonally.
9. It was noted that attaching light fixtures to the house is discouraged for preservation reasons.



SOUTH ELEVATION



LOOKING NW AT PORTE-COCHERE



LOOKING NE AT PORCH



LOOKING SE AT NORTH ROOM



EAST FACADE

2.0 INTERIOR

2.1 GENERAL

1. Survey was performed from approximately 10AM through 4PM on a mostly clear day. Daylight levels were observed to be quite high in most rooms during mid day and decreased considerably in the eastern facing rooms as the afternoon progressed and sky started to cloud over.
2. Light sources in historic areas are 80% 48V (long life) incandescent lamps and 20% 120V. Non-historic areas typically use linear fluorescent lamps, all long lamp life sources.
3. The house is open approximately 35 hours per week most of the year, and approximately 50 hours per week during the summer for a total of approximately 1,500 hours allowing lamp replacements to be measured in years. It was noted that relamping was not an issue except in sourcing the 48V lamps.
4. All historic areas were predominantly lighted with incandescent lamps which are high color rendering sources.
5. Staff noted that the house shows best on days with greater day light contribution. This refers to bright clear days, more so in winter when the surrounding trees lose their leaves (see item 4) and especially when the surrounding area is blanketed with snow.
6. It was noted that the majority of trees in the close vicinity to the house are on the south and east side affecting these rooms seasonally.
7. It was noted that all windows had UV reducing film installed on the inside of the storm windows in 1993 that reportedly remains in good condition. Film specifications were not known. It was noted that the storm windows are removed in the summer months.
8. Illumination levels from electric light throughout the house were generally between 0.5 and 1.0 footcandles with values as low as 0 and as high as 1.5.



PARLOR



LIBRARY



PARLOR



BEDROOM 4

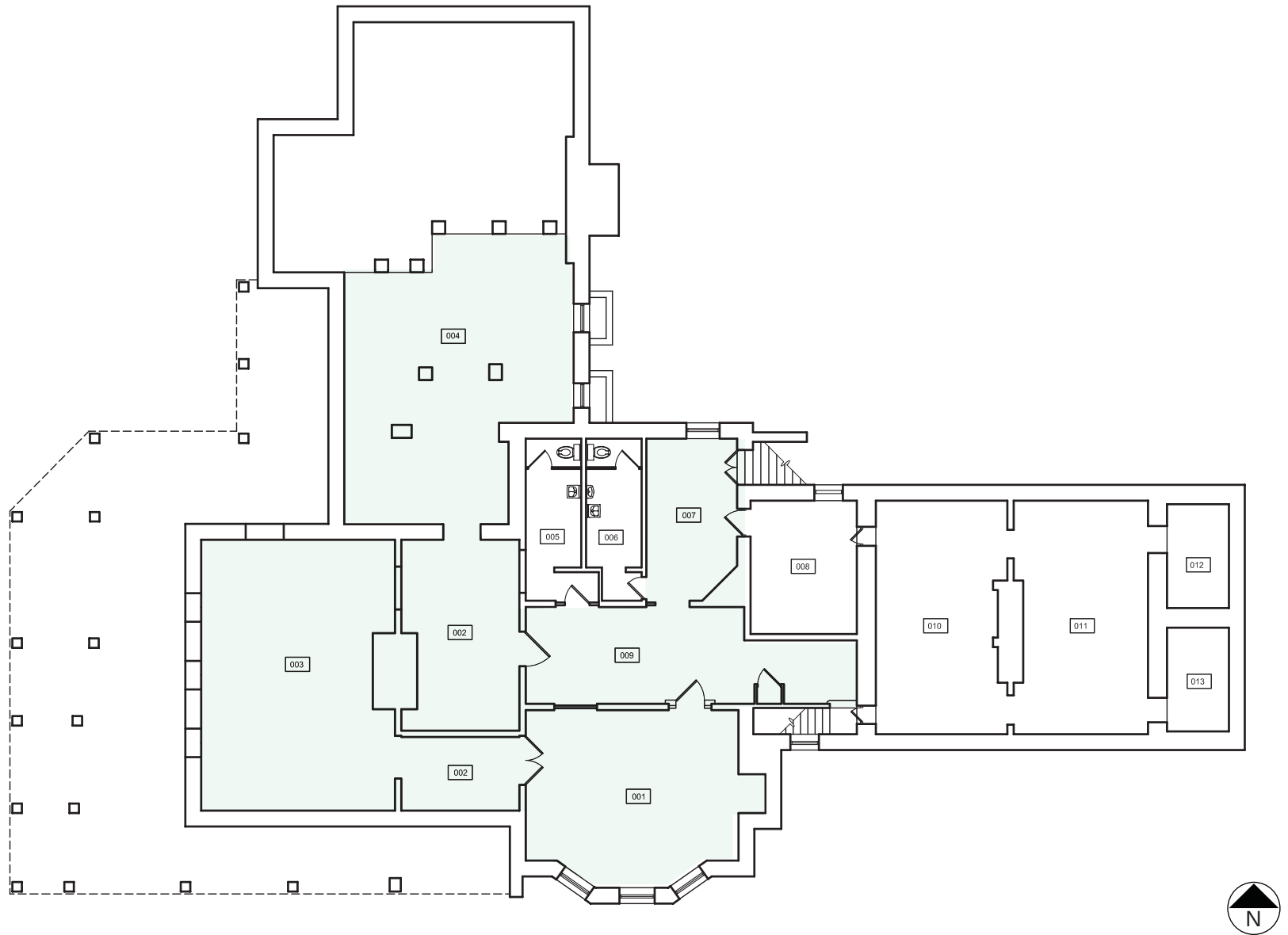


BEDROOM 5

2.1 GENERAL (continued)

9. It was noted that the low light levels were intended to recreate the visual conditions in the gas lighted environment of Roosevelt's day
10. While the goal is to give the Visitor an accurate sense of the house when it was the Roosevelt family's home, it was discussed that Sagamore was typically a summer (only) house and therefore the front door (at least the top half) would most likely be open all day allowing more daylight in, and before the North Room was built during the presidential years there was a door to the former north porch that also provided light into the Entry Hall. It was also noted that the laylight over the stairs was an actual skylight which would have also added appreciably more light to the core of the house.
11. Awnings were in place down over four windows during our visit and our observations are limited to this. There were several other awnings located on the house in the up position but their frequency of use or effect on the interior daylighting is not part of this report.
12. No issues were reported for the Second and Third floor rooms, our observations concur that the light finishes and ample daylight work sufficiently.
13. The interior house lights are controlled by two time clocks with the period lights on one and the remaining light fixtures on the other. These are basic time clocks that operate on a year round dawn to dusk basis.
14. This report does not pre-empt any prior suggestions regarding light fixture aesthetics, locations or style as noted in the HSR reports. Exception are noted for the North Room and Entry Hall.
15. The house is not used for special events and this is not thought to change.
16. Most historic rooms are powered by a 48V supply system which was installed in the 1980's. The 48V lamps are becoming increasingly harder to source but last several years.

3.0 BASEMENT

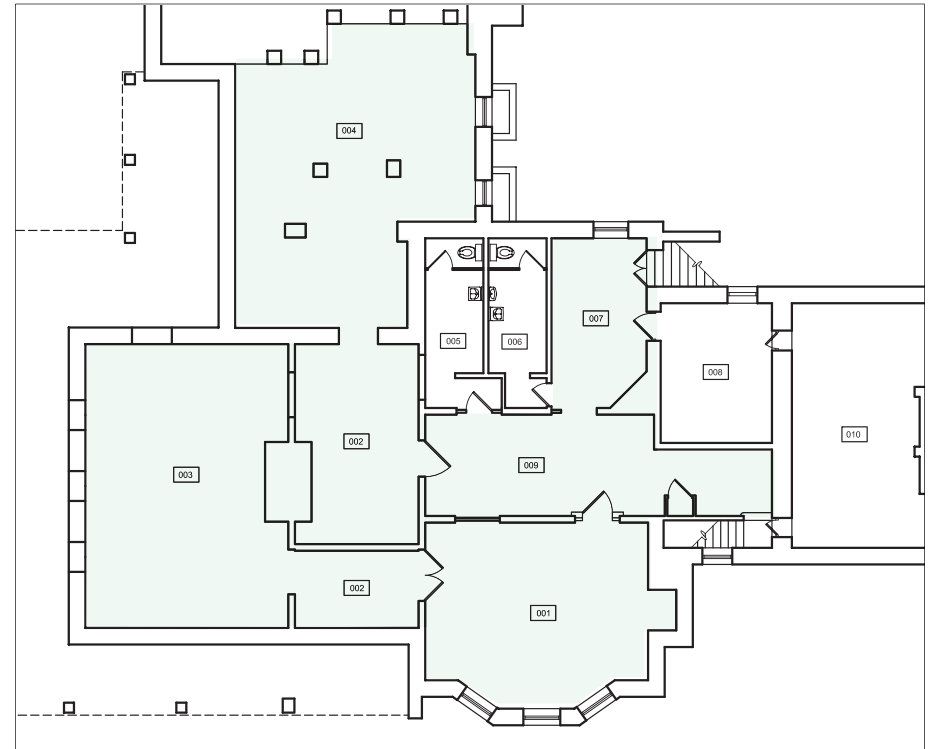


Basement Level

Scale: 1/16" = 1'-0"

3.0 BASEMENT

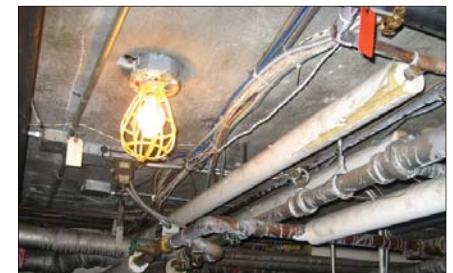
1. Clean areas are generally lighted to an adequate level with surface mounted 1'x4' T8 fluorescent fixtures with wrap-around lenses.
2. Mechanical rooms are typically lighted with ceiling mounted sockets with incandescent A lamps and controlled locally.
3. It was noted that the interior house lights are time clock controlled but the manual override switch (used when entering the house after hours) is not conveniently located by the entry door forcing someone to walk thru darkness to get to the (override) light switch.



BASEMENT ENLARGED PLAN

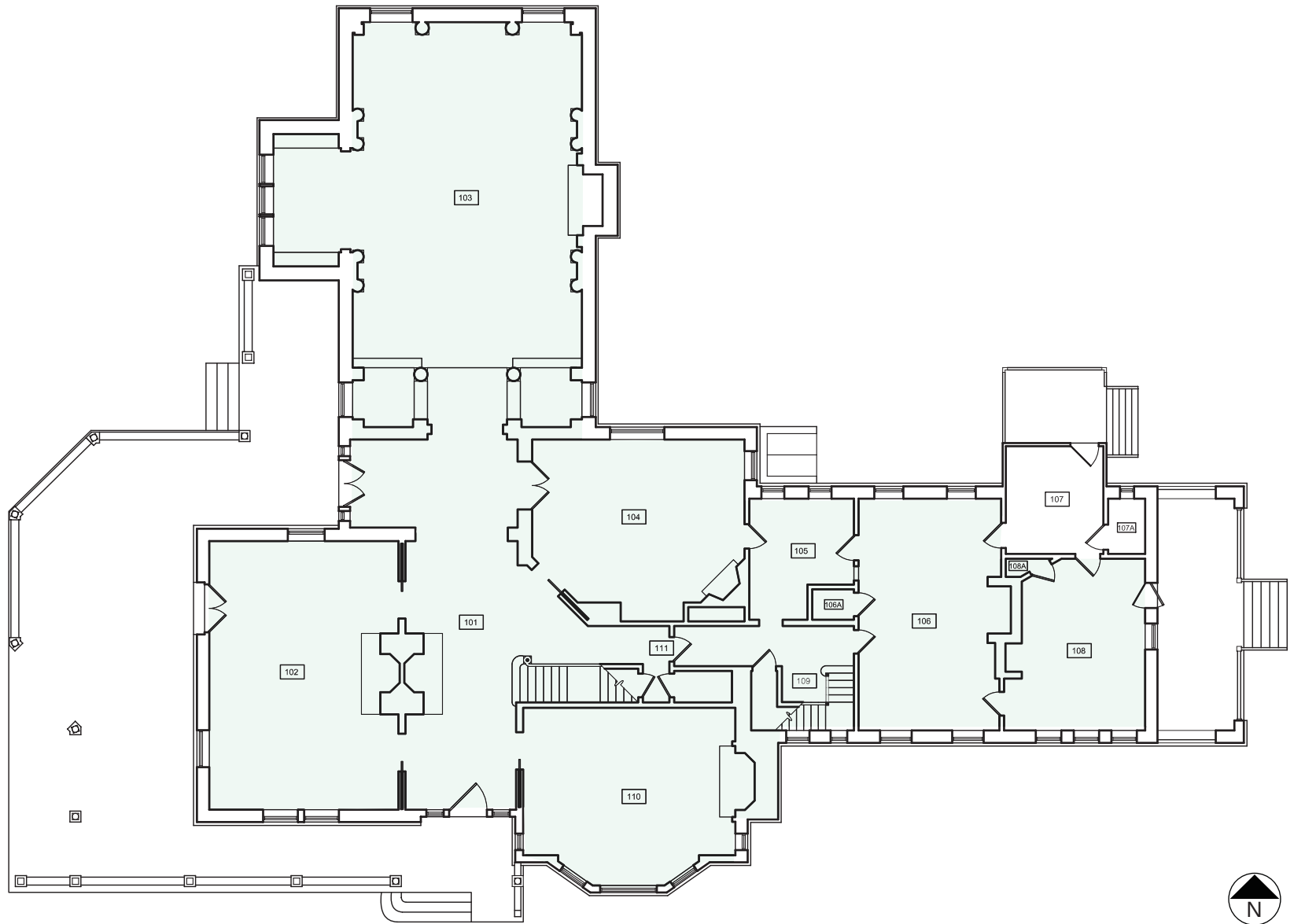


FLUORESCENT FIXTURE



INCANDESCENT

4.0 LEVEL ONE

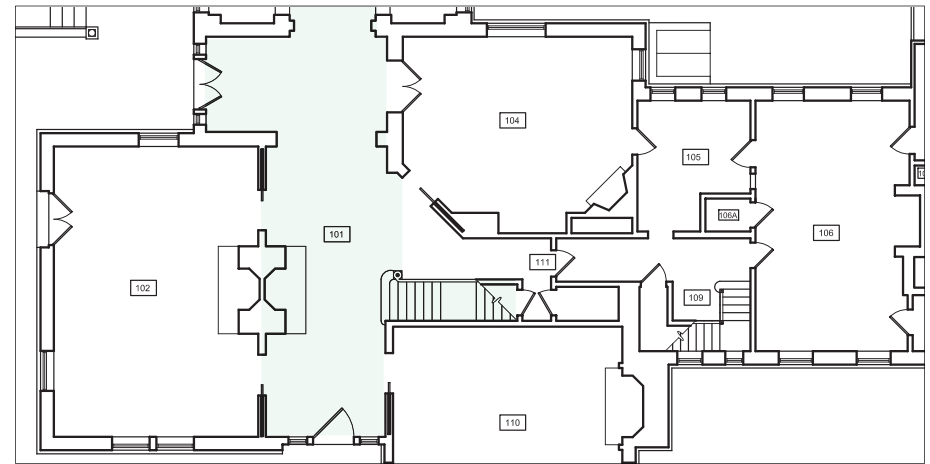


Level One

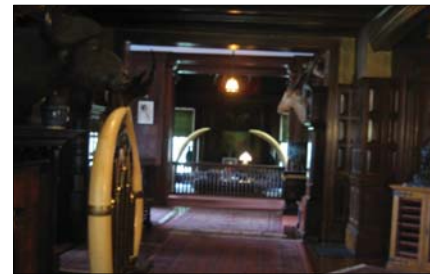
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4.1 RM 101 HALL AND STAIR

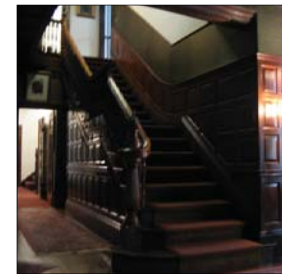
1. Dark wood paneling on the walls and ceiling provides an exceedingly dark introduction to the house.
2. The dark furniture and dark objects, coupled with the very dark view of the North Room furthers challenges the eye when entering from the outdoors.
3. The electric light sources consist of two surface mounted down light cylinders (one in front of the fireplace and one in front of the former Dining Room entry door), historic floor lamp between the Library and Stair, historic pendant lantern at the front door and a second outside the Dining Room.
4. The historic floor lamp is extremely bright to the point of reducing visibility in the space unless one shields it from their view.
5. In addition, there is some light contribution from the second floor laylight over the stairs, and daylight contribution from the Parlor doors, front door side-lights and west porch entry.
6. The high contrast presented by the daylight from the two entry doors compounds with the dark room finishes to further diminish one's ability to see and requires quite a few minutes for visitor's eyes to adapt. Even after this adaption period however, visibility remains low.
7. While most rooms in the house can only be viewed from the threshold making close inspection of artifacts difficult or impossible, the Entry Hall allows visitors to freely navigate and view objects from up close. However even this advantage is not enough to appreciate the room and its artifacts due to the lighting shortcomings.
8. HSR report notes that a gas bracket existed on the west wall near the front entrance.



RM 101 HALL AND STAIR ENLARGED PLAN



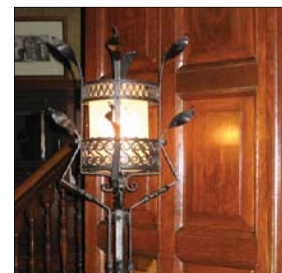
VIEW TO NORTH ROOM



STAIR



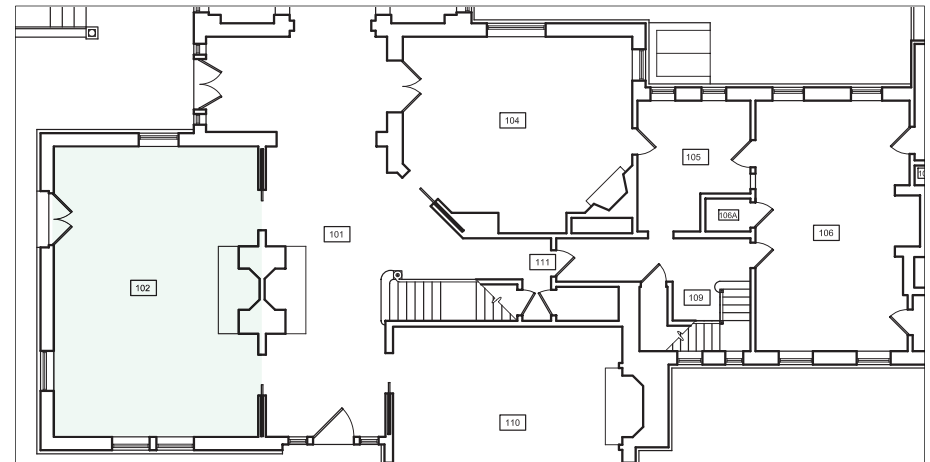
SURFACE MOUNTED CYLINDER



HISTORIC FLOOR LAMP

4.2 RM 102 PARLOR

1. Light wall and white ceiling finishes, coupled with light colored furnishings and the tall windows on three sides makes this perhaps the best lighted room in the house.
2. The two x 3 head historic sconces also contribute to the overall bright impression of the room.
3. The sheer window treatments allow a maximum amount of daylight through the full height of the window into the room.
4. Awnings were still in place on the south facing window.



RM 102 PARLOR ENLARGED PLAN



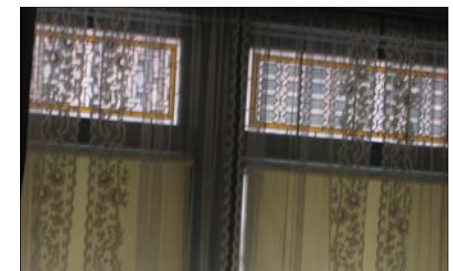
LOOKING SE



LOOKING N



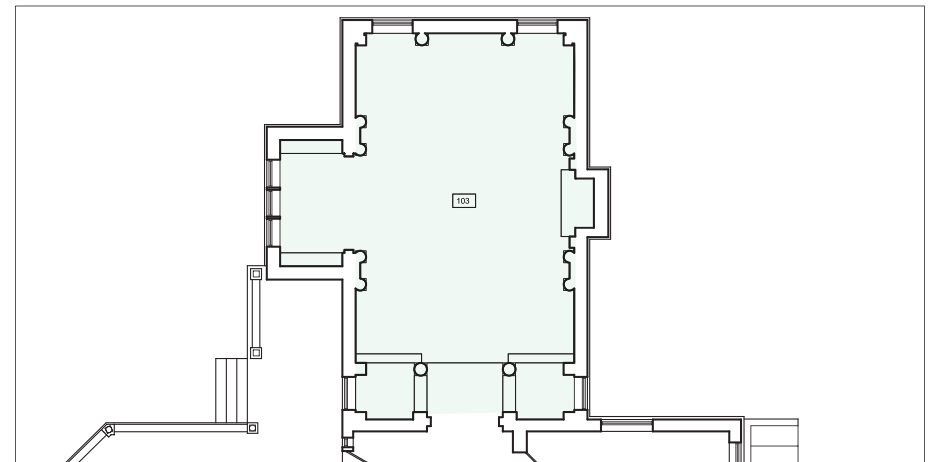
HISTORIC SCONCE



SHEER WINDOW TREATMENT

4.3 RM 103 NORTH ROOM

1. The dark wood wall and ceiling finishes and many dark objects contribute to the low level of visibility in this room, similar to the Entry Hall.
2. The two windows on the opposite wall of the viewing position, and the ones flanking the viewing position produce an excessive amount of glare further reducing one's ability to appreciate the many objects of interest in this room. These windows render the area between them completely dark which unfortunately is the focus of most first views from both the Entry Hall and upon entering the room.
3. The set of windows in the alcove are well located to contribute light in the center of the room since they are largely shielded from view but opaque green shades cover the upper half of the windows which limits their effectiveness.
4. There are two supplementary fluorescent light fixtures concealed from the public's view and located on the fascia above the viewing position which add light to the front third of the room. There are two additional floor mounted fluorescent fixtures located out of view in the alcove on the west side and behind the northernmost column on the east side which add light to the rear third of the room.
5. The large size of this room results in Visitors being a long distance from many of the objects and magnifies the problems caused by the high contrast, glare and low light levels.
6. There are three table lamps in the room that are good visual accents but add little illumination.
7. Awnings were still in place on the west facing windows.
8. HSR report notes that a pair of kerosene lamps were once located on the mantle shelf of the fireplace.



RM 103 NORTH ROOM ENLARGED PLAN



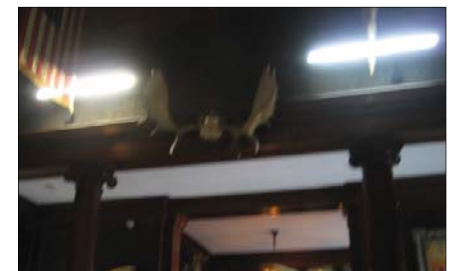
LOOKING S



LOOKING NW



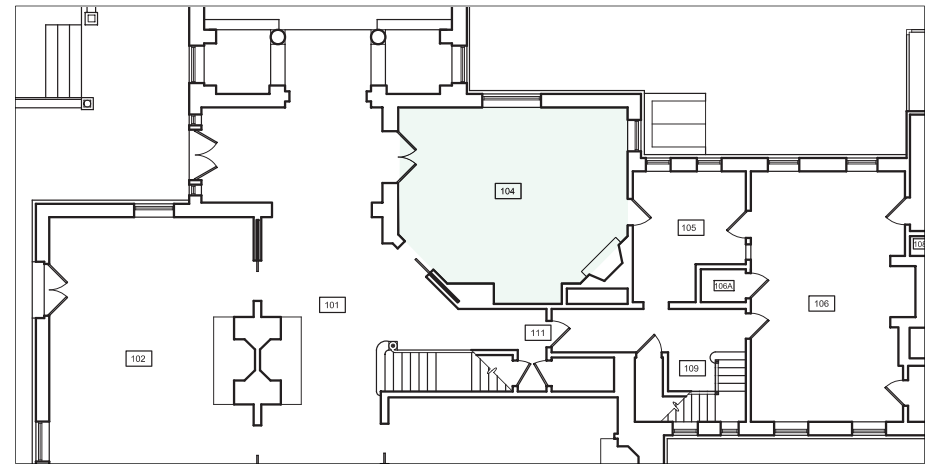
LOOKING NE



SUPPLEMENTAL FLUORESCENT FIXTURES

4.4 RM 104 DINING ROOM

1. This modest sized room benefits greatly from two windows, one of which is quite large and located obliquely from the Visitor's point of view so its brightness is largely shielded from view. It's location on the room's long wall also adds useful light throughout most of the room. The sheer, full height window treatments also allow a maximum amount of light into the space.
2. The white ceiling (with wood beams), medium value walls and light colored carpet and tablecloth provide a bright appearance that is further enhanced by the sparkling glass and silverware.
3. The four x 3 headed historic sconces also contribute a generous amount of electric light, the most of any room in the house, particularly on a per square foot basis.
4. The HSR reports that the four original gas brackets were replaced with "electric wall brackets with two lights" so presumably the current fixtures were installed at a later point.
5. The 3 headed sconces were observed to be quite large given the scale of the room and the lamps somewhat bright.
6. The historic sconces were observed to be quite bright, perhaps partly due to these being powered by the 120V supply system in the house.



RM 104 DINING ROOM ENLARGED PLAN



LOOKING E



LOOKING SE



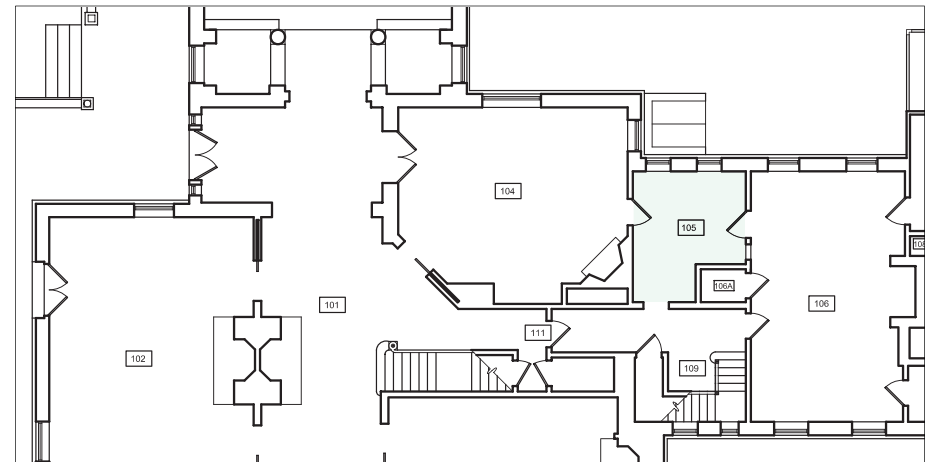
BEAM CEILING DETAIL



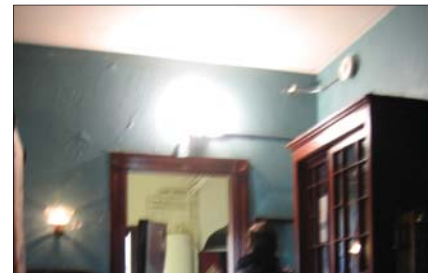
HISTORIC SCONCE

4.5 RM 105 PANTRY

1. The Pantry has dark walls, dark wood millwork and floors, and a white ceiling.
2. When viewed from the hallway, one of two windows is on the opposite wall. While this would normally create problematic glare, the daylight from the neighboring window as well as an out of view light fixture provides enough internal illumination to offset the brightness of this window.
3. The sheer window treatments and white shades maximize the amount of daylight.
4. There is a floor mounted supplemental fluorescent light fixture located to increase light levels on the wall opposite the floor safe. The fixture was either not lighted or not operable during this visit.



RM 105 PANTRY ENLARGED PLAN



LOOKING EAST



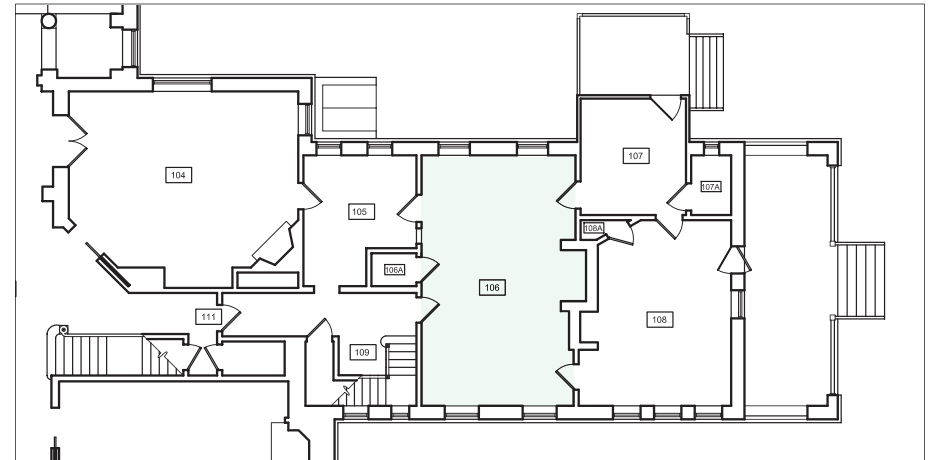
LOOKING SOUTH



SHEER WINDOW TREATMENT ABOVE SINK

4.6 RM 106 KITCHEN

1. The two large windows on each the north and south walls provide a generous amount of daylight that is maximized by the light colored walls and ceiling.
2. The two small historic wall sconces would not provide much light after dark.



RM 106 KITCHEN ENLARGED PLAN



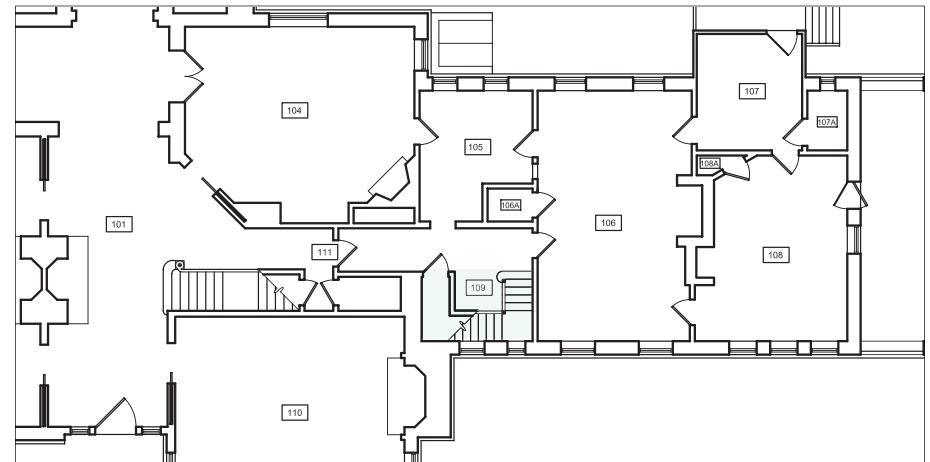
LOOKING N



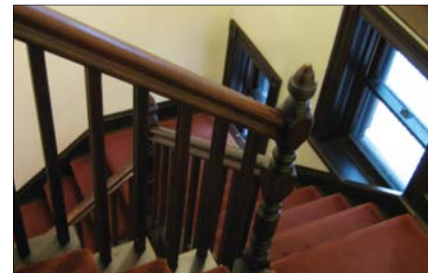
LOOKING E

4.7 RM 109 REAR STAIR

1. This stair has many windows on the adjacent wall which negate the need for any electric lighting during the day.
2. The light wall and ceiling finishes, coupled with the ceiling mounted light fixture provide ample electric light.



RM 109 REAR STAIR ENLARGED PLAN



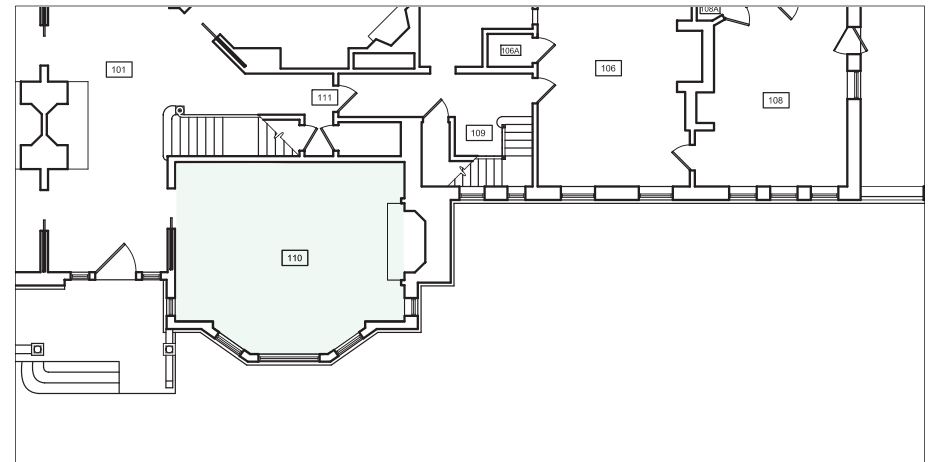
FROM LEVEL TWO LANDING



WINDOWS AT REAR STAIR

4.8 RM 110 LIBRARY

1. It was observed that later in the afternoon, this room became increasingly dark as the daylight dropped, revealing the lack of adequate electric light.
2. The dark wall finishes, dark wood millwork filled with books and shallow niche around the fireplace contribute to the low key condition.
3. There are three historic table lamps, one historic floor lamp and one x 2 headed historic sconce. Most of these fixtures are clustered in the southwest corner of the room leaving much of the remaining portion of the room under-lighted. There is also a floor mounted fluorescent fixture concealed from view in the southwestern corner of the room.
4. Awning was still in place on the center bay window (only).



RM 110 LIBRARY ENLARGED PLAN



LOOKING E



LOOKING W

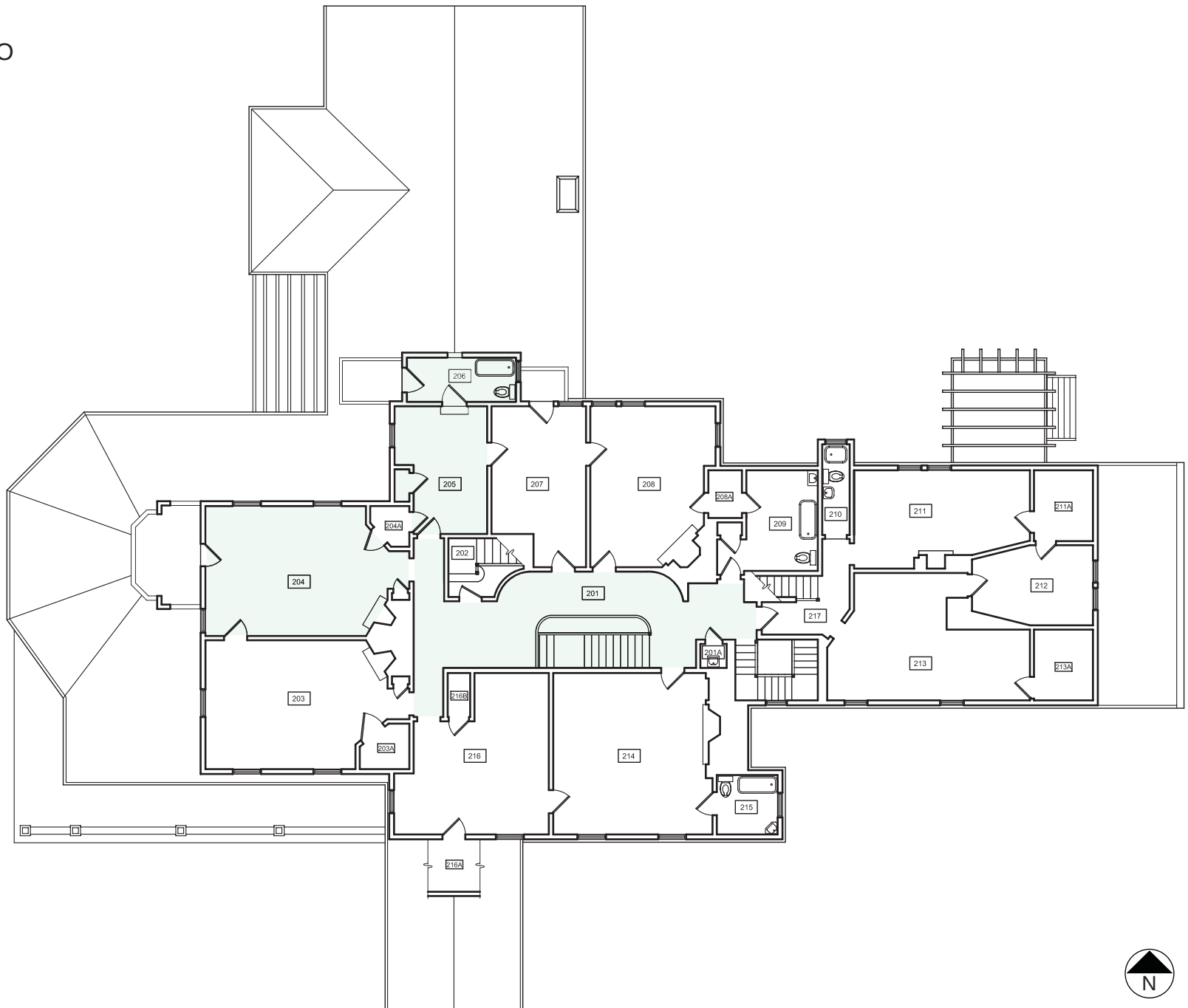


SUPPLEMENTAL FLUORESCENT FIXTURE



HISTORIC SCONCE

5.0 LEVEL TWO



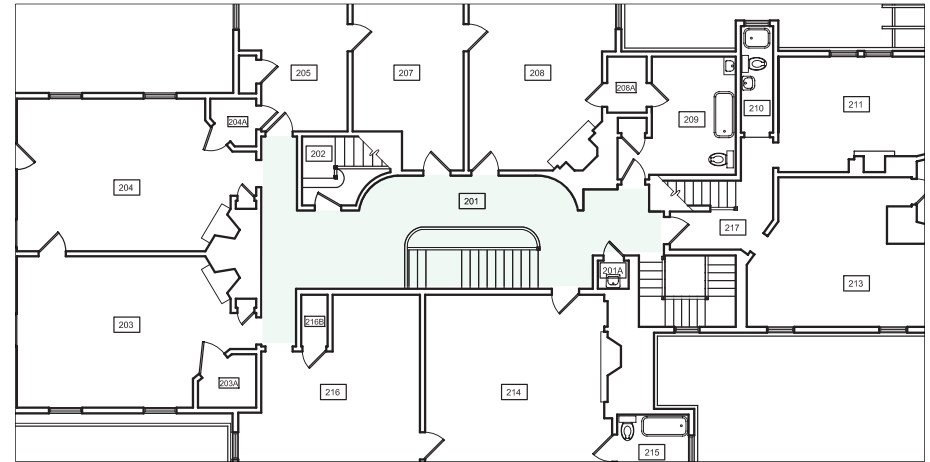
Level Two

Scale: 1/16" = 1'-0"

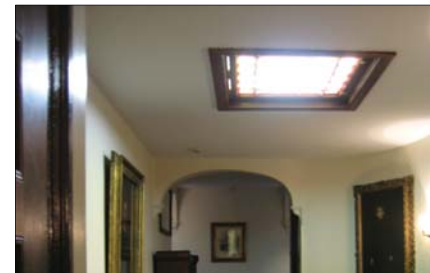
II. OBSERVATIONS

5.1 RM 201 STAIR

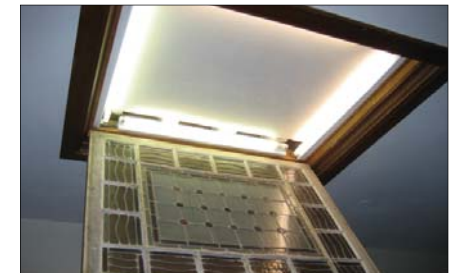
1. The Stair Hall is lighted with one sconce and the center laylight in the center hall.
2. Laylight contains three T8 fluorescent lamps and one T12 fluorescent lamp around the perimeter of an approximately 3 inch deep white cavity. The older technology T12 lamp is on the south side of the laylight and since it is over the stairs, is the most difficult to access. This may explain why this lamp was not changed to T8.
3. Due to the shallow depth, the laylight glass is not uniformly lighted and the lamps are visible through the glass.
4. Laylight glass hinges open and is accessed from the upstairs landing.
5. Light level half way down the stairs was measured to be 0.7 fc and 1.9 fc on the second floor.
6. The near white walls and ceiling contribute to the well lighted space.
7. The west end of the hall leading to the Master bedroom and Gate Room contains two surface mounted cylindrical downlights in these otherwise small but unlighted area.



RM 201 STAIR ENLARGED PLAN



CENTER LAYLIGHT



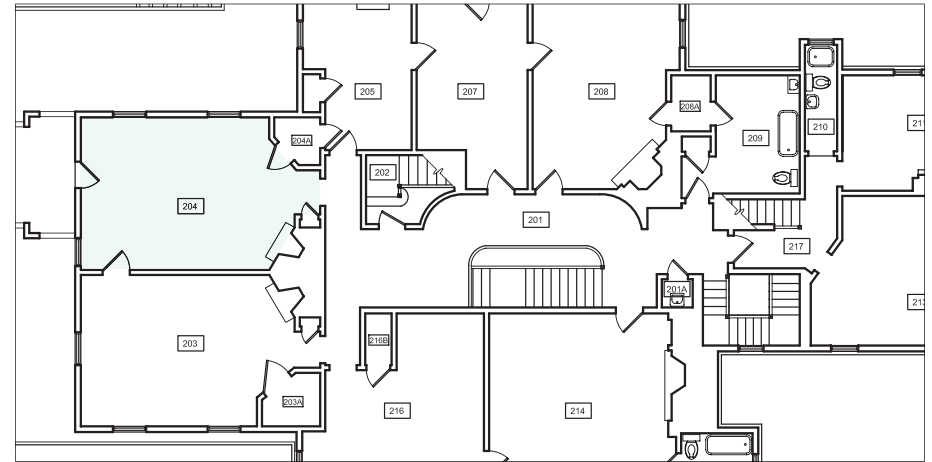
INTERNAL VIEW OF LAYLIGHT



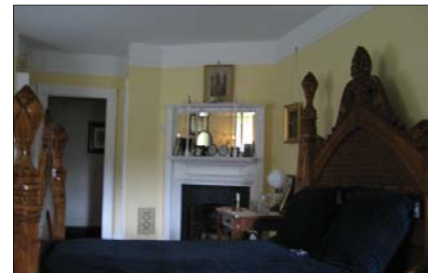
SURFACE MOUNTED CYLINDER FIXTURE

5.2 SECOND FLOOR BEDROOMS

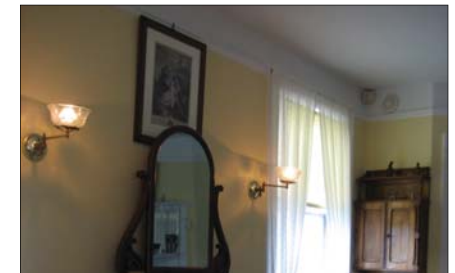
1. The second floor bedrooms typically have light wall finishes and multiple windows which provide for well lighted environments.
2. As is typical for most residential bedrooms, there are typically (historic) wall sconces and table lamps in these rooms that contribute little overall illumination.



RM 204 MASTER BEDROOM ENLARGED PLAN



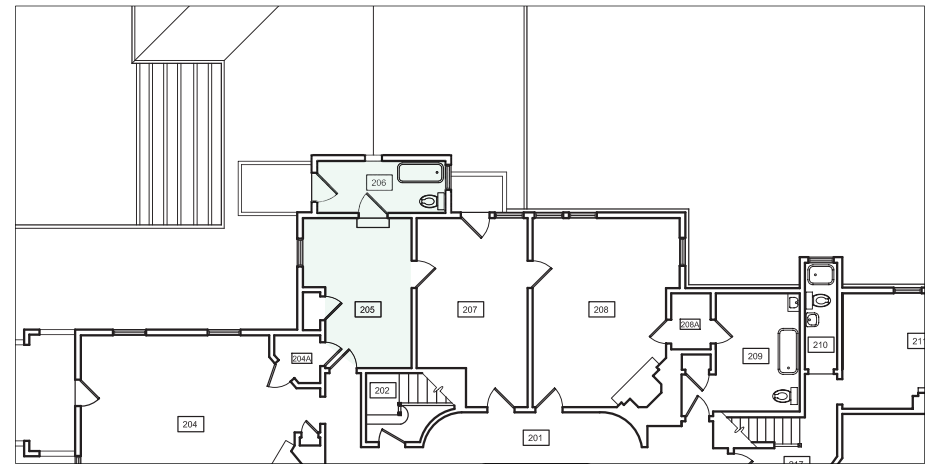
LOOKING E



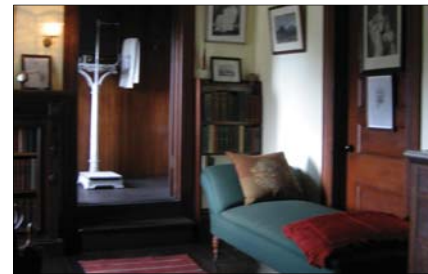
LOOKING N

5.3 RM 205/ 206 DRESSING/ BATH

1. The Dressing Room and adjacent bathroom are similar to the bedrooms in that there is an abundance of daylight which does not require the electric sources to do much “work” during the daytime hours.
2. The dressing room also has light wall finishes which help show the number of objects of visual interest. The bathroom has dark wood paneling but the bathroom windows easily allows the few objects to be appreciated.



RM 205/ 206 DRESSING/ BATH ENLARGED PLAN

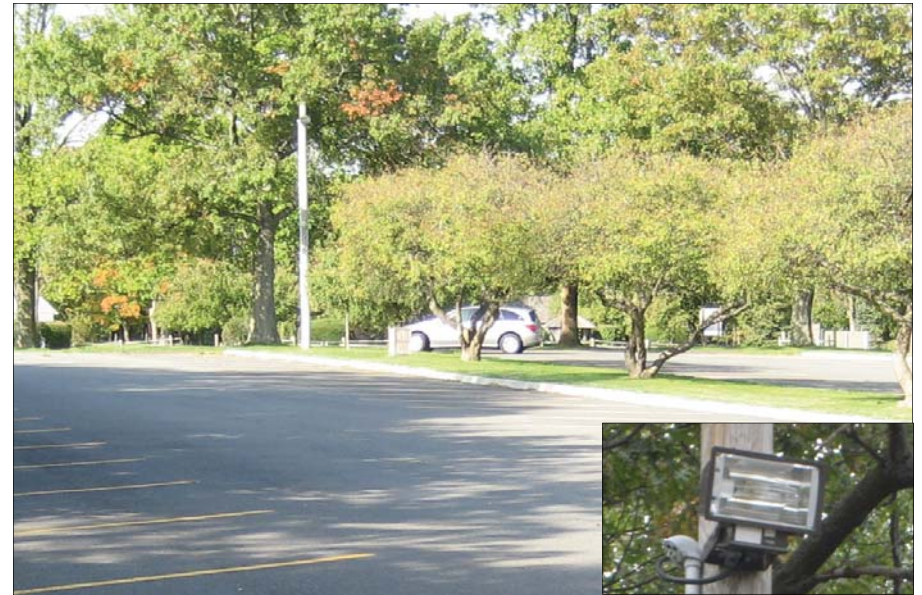


LOOKING N

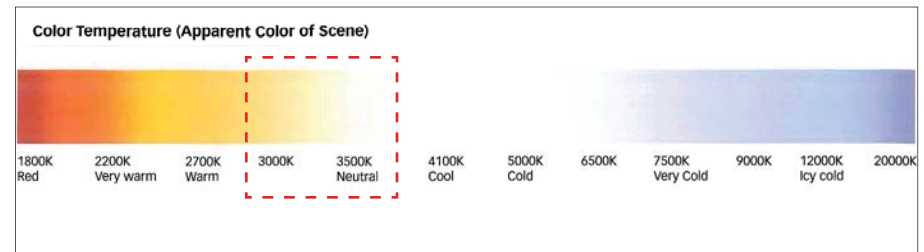
III RECOMMENDATIONS

1.0 EXTERIOR

1. All site (i.e. parking lot and path) lighting fixtures are to minimize light trespass from the site and reduce sky-glow as described in the United States Green Building Council (USGBC) LEED Light Pollution credit guidelines to the greatest extent possible.
Note: Security lighting of house may challenge full compliance with LEED guidelines.
2. Site lighting fixtures to be full cutoff type and floodlights to have well shielded sources.
3. Sagamore Hill site to be considered Lighting Zone (LZ) 1 for “low ambient light” as defined by the Illuminating Engineering Society of North America (IESNA).
4. Site lighting illumination levels to be consistent with IESNA guidelines (Parking lot: 1 footcandle average, 20:1 uniformity ratio of maximum:minimum, Paths: 0.5 footcandle average, no uniformity requirements).
5. All exterior lighting sources to have neutral color (3000K to 3500K) and very high color rendering (80+).
6. All exterior lighting to be controlled with time clock. Zoning to be coordinated with NPS.
7. Parking lot lighting to utilize the minimal number of low height poles necessary to satisfy the illumination criteria noted above.
8. House floodlighting to minimize hard shadows from projected portions of the building.
9. While the lensed light fixture under the porte cochere was not lighted during our visit, it appeared that the effect would be glary and unflattering in the nighttime environment. We have not found any historical references to this fixture and if appropriate we recommend that it be replaced with a less obtrusive fixture to light the stairs. The front entry façade lighting may be best addressed as part of the overall building façade lighting scheme.
10. See Section 2.2 for further discussion of sources.



EXISTING PARKING LOT AND LONE LIGHT POLE

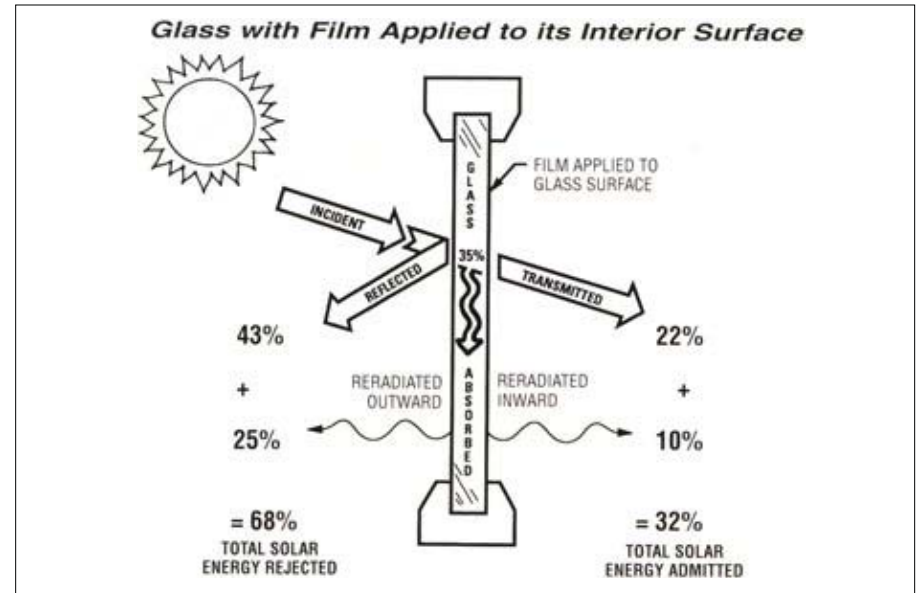


COLOR TEMPERATURE CHART

2.0 INTERIOR

2.1 GENERAL

1. While we were told the daylighting conditions we observed were representative of a “good” day illumination level-wise, further year round study noting various sky conditions is recommended to best determine location and amount of light reducing film. Tests can be made with theatrical gels before final architectural films are applied.
2. It is recommended that the House electrical system switch over to 120V to allow a wider selection of light sources which are more readily available. Consideration needs to be made regarding the effect of rewiring on the architectural finishes as well as the compatibility of 120V lamp holders with the existing 48V versions.
3. Continue the use of incandescent sources in the historic areas is encouraged given the warm, inviting color, suitable distribution, long life, low energy use and low cost. While LED's have been improving quickly and are applicable for many conventional interior applications, the specialized needs of these residential fixtures do not lend themselves to LED at this time. Light sources are discussed further in the Recommendations section.
4. A more sophisticated time clock that can daily and/or seasonal control is recommended to allow switching that better conforms to the building's hours of use.
5. Our understanding is that the lighting override switch is located in the basement at the panels. It is recommended to have a switch or occupancy sensor located at the first floor entry door so someone would not need to negotiate through a dark house to get to the light switch.
6. Occupancy sensors are to be studied throughout the house. It is possible that given the limited energy use in the building there may not be significant value to this concept. The idea of lights being off or switched off while Visitors are in the house may compromise the experience by being seen as a modern intrusion.



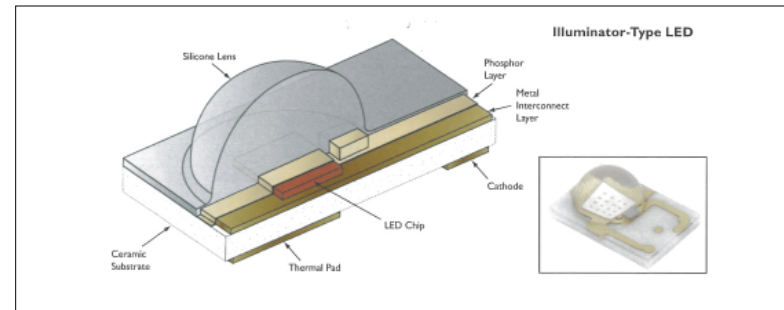
FILM ON GLASS

2.1 GENERAL (continued)

7. All existing UV film is to be inspected to confirm if replacement is required. UV film is recommended to be installed on the inside of year round windows (versus storm windows).
8. Path of egress illumination levels were discussed. While an engineer or local code consultant is to review the local requirements, it was noted that 1.0 minimum foot-candle (fc) at the floor is the typical United States standard; this value represents a significant increase in the amount of electric illumination in the house. A more appropriate standard may be 0.1 fc minimum in egress paths as recommended by the IESNA.
9. Daylight sensors are recommended to only turn on the period lighting when required. Rooms may be grouped on a single sensor depending on their exposure to daylight.
10. More investigation of historic lighting fixture locations is required.

2.2 SOURCES

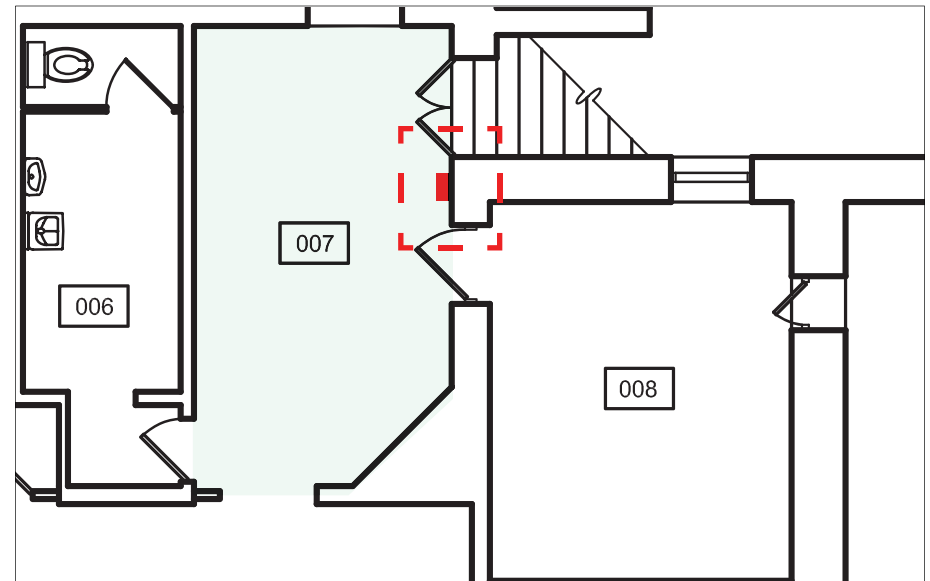
1. While LED's have often attracted attention due to their small size and reported long life, their many shortcomings have prevented their widespread use, particularly for interior applications. Given the rapid expansion of LED lighting products and the steady improvements in their reliability, color consistency, efficacy and optics in the last year, we now see a number of viable applications for this source on the project.
2. There has only been preliminary research performed regarding the UV content of LED sources but early indications are that the trace amount of UV in LED's is not harmful to museum environments.
3. Light source recommendations have become more complicated due to the rapid advances in LED technology. See notes below.
4. Exterior applications are best served by either ceramic metal halide lamps (which offer long life, excellent color rendering, very good color consistency and wide variety of shapes to accommodate various beam spreads) or perhaps LED's (which have very long life and reasonably good color characteristics). There may be a cost implication for some performance based light fixtures which are not yet widely available but as LED efficiencies improve, optics and performance will improve as well.
- 5.
6. With the possible exception of lighting proposed for the interior of the proposed restored light shaft, all the interior supplemental lighting applications (i.e. non-period lighting) discussed in this report may be accomplished with LED fixtures available today.
7. For the new exterior lighting, most or perhaps all of these applications may all be appropriately handled by LED sources.



CROSS SECTION OF LED

3.0 BASEMENT

1. It was noted that the house lighting timer override switch is not near the Basement entry door requiring one to negotiate through the dark to find the switch. A local switch more convenient to the entry is recommended.



BASEMENT PANEL ROOM 007 WITH RECOMMENDED LOCATION FOR OVERRIDE SWITCH.

4.0 LEVEL ONE

4.1 RM 101 HALL AND STAIR

1. In order to address the high contrast (and resulting low visibility) of the Entry, the brightness of the exposed light sources needs to be reduced and additional light introduced to raise the amount of vertical illumination in the space.
2. The darkness in the North Room is very visible when Visitors first enter the house, particularly the two north windows and the wall between them. This view corridor needs to be addressed. See further discussion in the North Room section.
3. The two surface mounted downlights are to be removed since they only contribute light to the floor below and are not visually compatible with the historic interior.
4. The transmission of the floor lamp diffuser is to be significantly reduced to reduce the glare from this fixture. The top is to remain open since this indirect light is useful.
5. The transmission of the windows in and/or around the door may need to be reduced to diminish the glare from these sources. This is to be achieved with clear light reducing film in order that the view is not compromised.
6. Restore the skylight system to the second floor Stair Hall. The second floor laylight would have been a major light source in the center of the house (and Entry Hall) before it was covered. The original skylight might have delivered 10 to 50 times the current amount of light to the Stair Hall area depending on time of day, sky conditions and tree cover. In addition to more light, the diffuse light from the light shaft above would have added much needed vertical illumination on all surfaces that “see” the laylight.
7. Small, very low brightness, low wattage floodlights (painted to match the wood) might be surface mounted to the dark wood beams to provide some base illumination to the fireplace wall and mantle area.



LOW VISABILITY IN ENTRY HALL



SURFACE MOUNTED DOWNLIGHT



HISTORIC FLOOR LAMP WITH DIFFUSER

4.1 RM 101 HALL AND STAIR

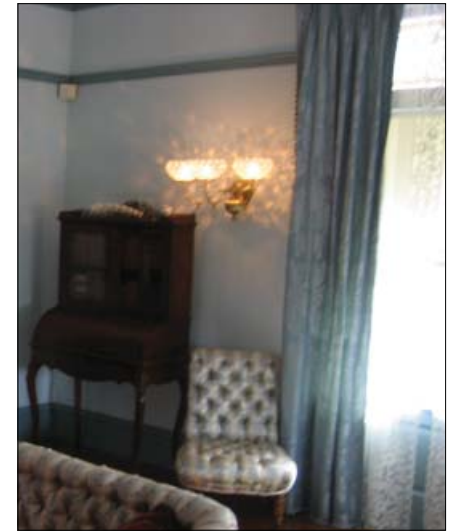
8. As per the HSR report, there was an original gas bracket located on the west wall. This extra light fixture may be a useful addition to this dark space.
9. HSR also suggests probing near the existing ceiling mounted downlights for evidence of prior light sources. Presumably prior light fixtures would have been centered between beams (like the period fixture near the front door) which these are not but probing is still recommended.

4.2 RM 102 PARLOR

1. The south facing window had an awning in place but the lower portion of the window was still quite bright, particularly as viewed from the Entry Hall. This window may benefit from some light reducing film as opposed to the west and north facing windows that are shielded by the porch.



SOUTH WINDOW EXTERIOR



SOUTH WINDOW INTERIOR

4.3 RM 103 NORTH ROOM

1. Similar to the Entry Hall, the brightness of the exposed light sources needs to be reduced and additional light introduced to raise the amount of vertical illumination and overall visibility in the space.
2. The view to the north wall is dominated by two extremely bright windows that cause the painting and objects on the center wall to be in near darkness. Clear light reducing film is recommended to reduce the transmission of this glass perhaps as much as 80% while maintaining the view beyond.
3. The four supplementary fluorescent light fixtures are to be replaced with neutral or warm white LED sources. Source color is to blend with the current available light in the room in order to be as unobtrusive as possible. The LED sources have far less UV and their projected beam would allow selected areas to be better served than the broad beam of the fluorescent. The new supplementary light fixtures might still be located on the vertical fascia above the viewing area.
4. Supplementary light fixture position might also be added out of view in the west alcove to boost the light levels in the fireplace area. This fixture may benefit from being positioned higher than the current floor mounted location to minimize the shadows of objects around the fireplace.
5. Clear light reducing film is recommended on the east and west windows of the viewing area where these bright sources hamper the Visitor's view of the surrounding space.
6. HSR mentions that kerosene lamps were at one time located on the fireplace mantle. Given the dark nature of the room, these additional light fixtures will help.



LOOKING N

4.4 RM 104 DINING

1. The brightness of the sconces is to be reduced. This might be achieved either by adding light reducing film/screen to the inside of the globes (allowing the uplight to remain as is) or by lowering the lamp wattage. Reducing the lamp wattage may compromise the generally good lighting level now present in the room.
2. Smaller globes might also be used that are better scaled for the room.

4.5 RM 105 PANTRY

1. Light reducing film is recommended for the visible window.
2. Concealed supplementary electric light to be added to allow better visibility of cabinet and contents. This may be served by the existing floor mounted fixture which was not operating during our visit.

4.6 RM 106 KITCHEN

1. We heard no issues related for this room and found none, no recommendations required.



SCONCES

4.7 RM 109 REAR STAIRS

1. We heard no issues related for this room and found none, no recommendations required.

4.8 RM 110 LIBRARY

1. Light reducing film is recommended for the bay windows.
2. Concealed supplementary electric light to be added to allow better visibility of cabinet and contents. This may be served by the existing floor mounted fixture which was not operating during our visit.



SUPPLEMENTARY LIGHT FIXTURE

5.0 LEVEL TWO

5.1 RM 201 STAIR

1. Restoring the skylight in the Stair Hall is highly recommended to restore high quality light to the core of the house. Besides illuminating the Stair Hall, this element would have a significant positive impact on the Entry Hall below.
2. We also recommend that supplementary electric light be incorporated into the restored skylight. The purpose of the electric light is to lengthen the times of year that the laylight produces useful light in the house. If done successfully, the electric light would not be discernible from the daylight.
3. In the event that the skylight is not able to be restored, we recommend making the light box above the laylight deeper to accommodate more lamps and better diffusion. This would allow the laylight to produce more light, hide the visible fluorescent lamps and better replicate its original skylight function. This recommendation must of course be researched by the Architectural team to confirm if it is possible.



LAYLIGHT

5.2 SECOND FLOOR BEDROOMS

1. We heard no issues related for this room and found none, no recommendations required.

5.3 RM 205/206 DRESSING/ BATH

1. We heard no issues related for this room and found none, no recommendations required.

IV CONCLUSIONS

1.0 PRIORITIES/ COST IMPLICATIONS

1. Restore Stair Hall Light Shaft (\$\$\$\$) - Despite the cost, this will have a large impact on the visual experience in the house and greatly improve the entry experience.
2. Add Light Reducing Film in North Room (\$) - Any lighting improvements for the north Room begins by reducing the glare from the north facing windows.
3. Replace and Add Additional Supplemental Light in North Room (\$\$\$) - Once the glare is reduced, adding more electric light is critical for allowing better visibility in this important room.
4. Replace Time Clocks (\$) - Better time clock control will improve maintenance.
5. Add daylight sensors to Period Rooms (\$\$) - Coupled with improved time clocks, this will greatly help maintenance and also more easily allow the rooms to be more accurate from an interpretive perspective.
6. Improve House Facade Lighting (\$\$) - While the house is not scene by many after hours, an improved lighting scheme will also aid security by improving visibility.
7. Replace 48V electrical system (\$\$\$\$) - This improvement will ensure availability of lamps in the future.

2.0 BIBLIOGRAPHY

1. IESNA Lighting Handbook
2. USGBC Leed V3 Reference Guide
3. Draft Model Lighting Ordinance
4. Plus Group Sagamore Hill Site Report
5. SAHI HSR Addendum 08-2010 Electrical
6. SAHI HSR Addendum 08-2010 Illuminating Gas