

Designers Lighting Forum

Adapting The Past To An LED Future

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3/14/22



Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with **AIA CES** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any

material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Learning Objectives

At the end of this course, participants will be able to:

1. *Luminaire Survey*: Discuss identifying existing historic luminaire conditions, historic elements, electrical assessment, finish and mechanical deficiencies in relation to specifying lighting upgrade options.
2. *Specification Development*: Develop work scope for upgrading and restoring a historic lighting fixture with LED technology, UL standards, and conform with modern building codes/regulations.
3. *Luminaire Modernization*: Identify how a combination of LED options can be implemented in historic luminaires, and for a maximized return on investment.
4. *Logistics – Safe Removal, Testing, & Installation*: Discuss the techniques for the safe removal, transport, installation, testing, and reassembly of LED systems on historical lighting fixtures.



Luminaire Survey

**Specification
Development**

**Luminaire
Modernization**

**Logistics – Safe Removal,
Testing, & Installation**



Assessing Conditions

Developing Options

Identifying Solutions

Implementation

Luminaire Survey

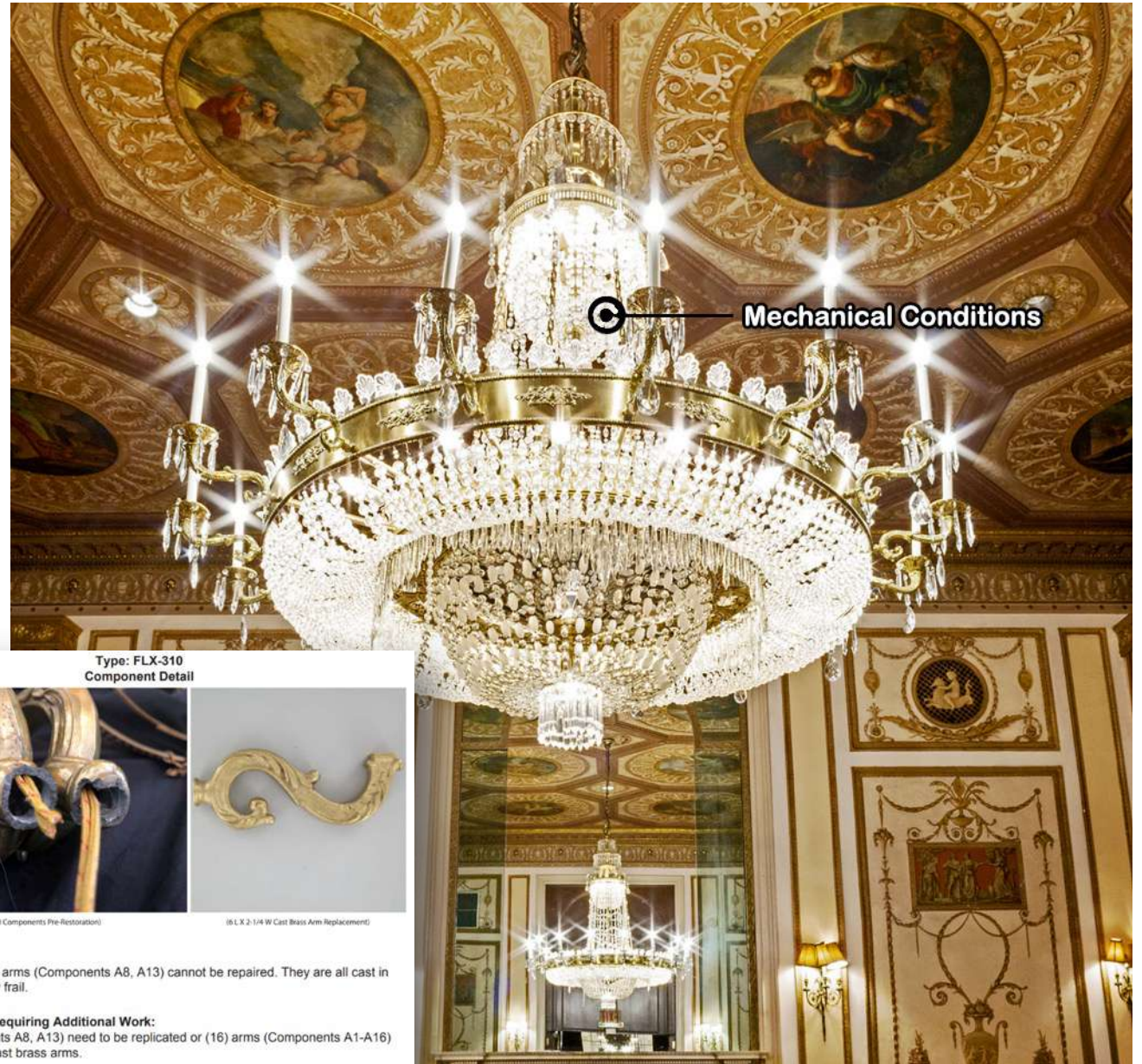


Assessing Conditions



Luminaire Survey

- Mechanical Condition



Type: FLX-310
Component Detail



(A8 & A13 Components Pre-Restoration)

(8 LX2-1/4 W Cast Brass Arm Replacement)

Factory Evaluation:

- (2) broken/damaged arms (Components A8, A13) cannot be repaired. They are all cast in white metal and very frail.

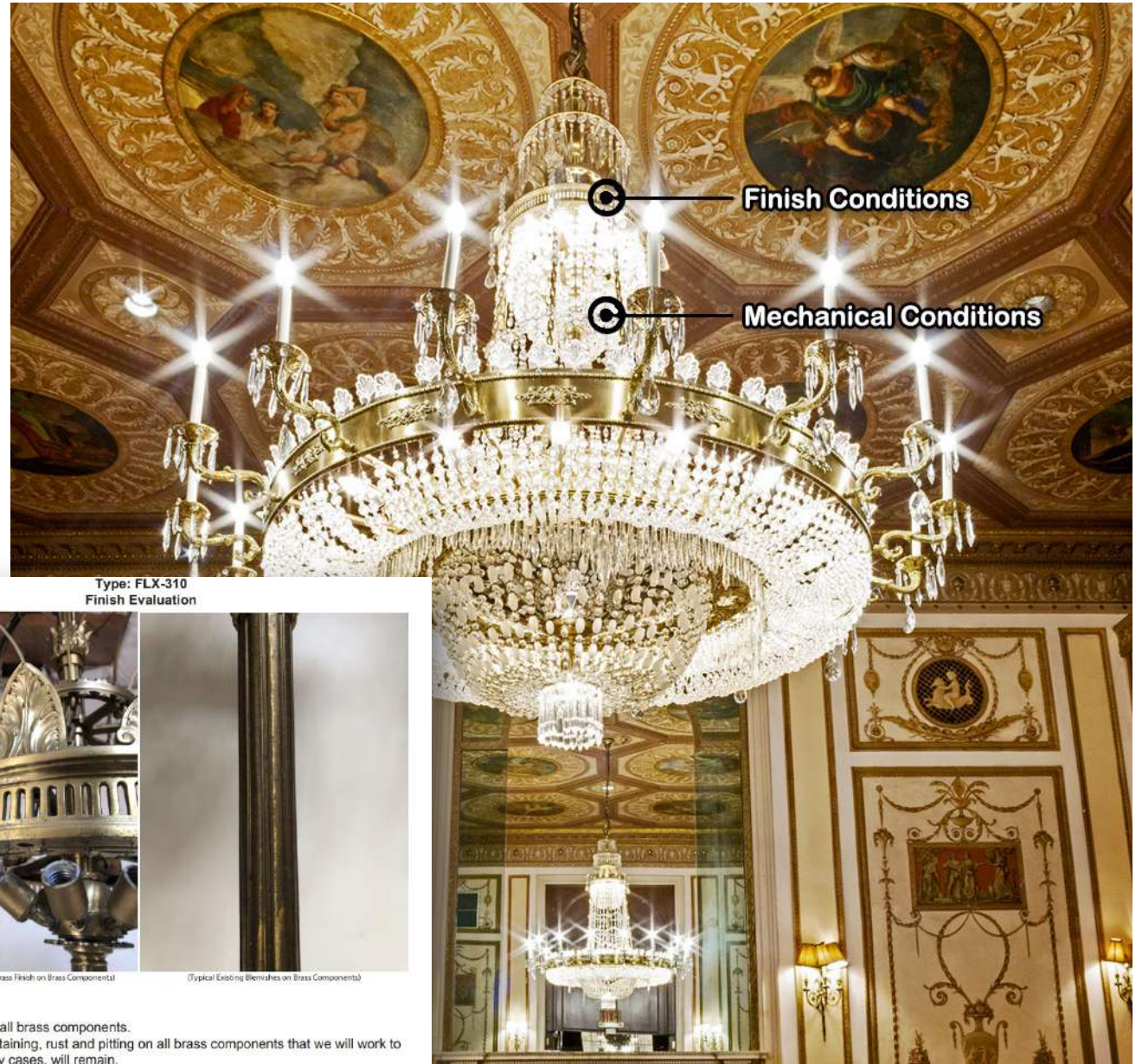
Factory Evaluation Requiring Additional Work:

- (2) arms (Components A8, A13) need to be replicated or (16) arms (Components A1-A16) replaced with new cast brass arms.



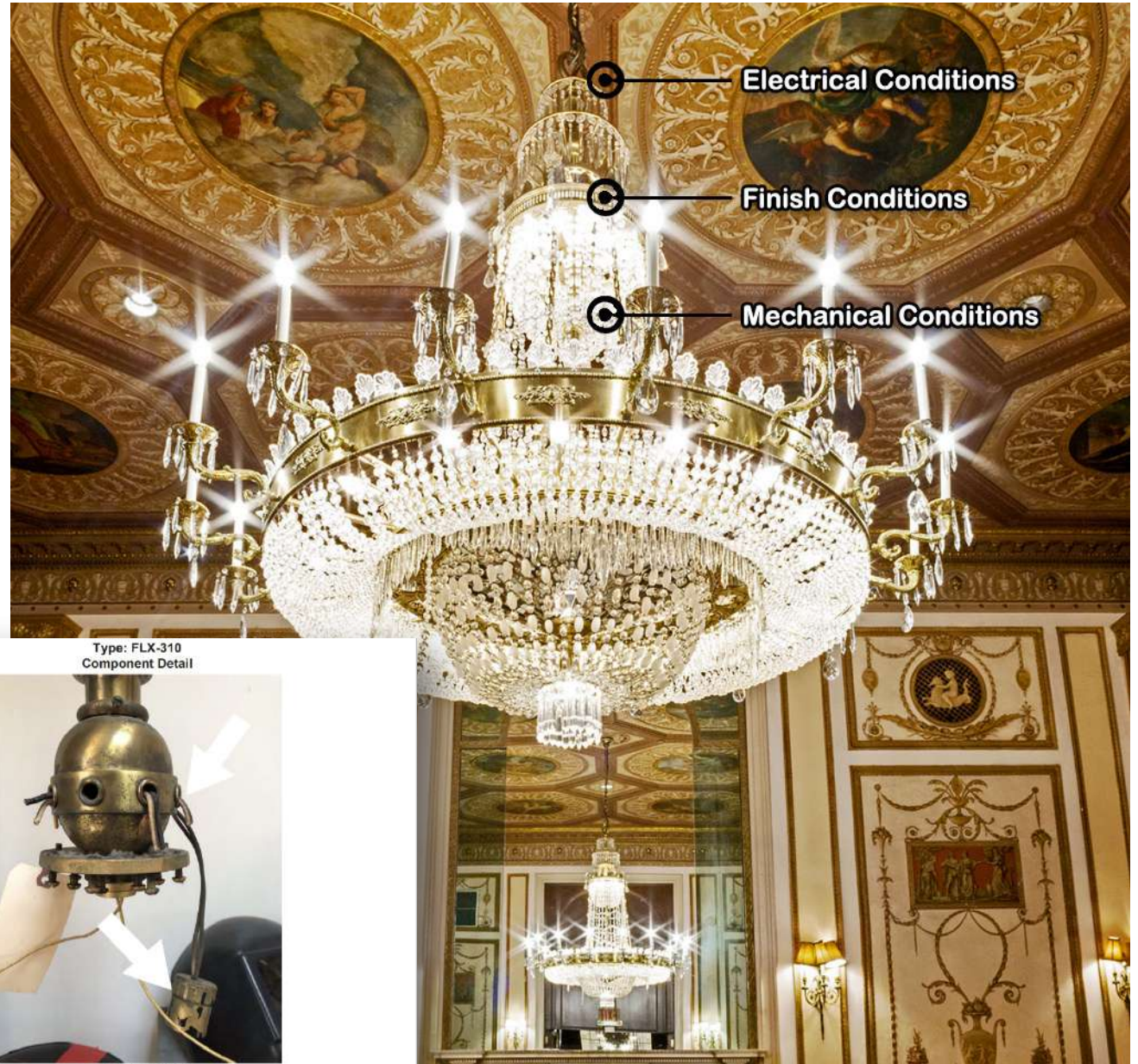
Luminaire Survey

- Mechanical Condition
- **Finish Condition**



Luminaire Survey

- Mechanical Condition
- Finish Condition
- **Electrical Condition**



Type: FLX-310
Component Detail



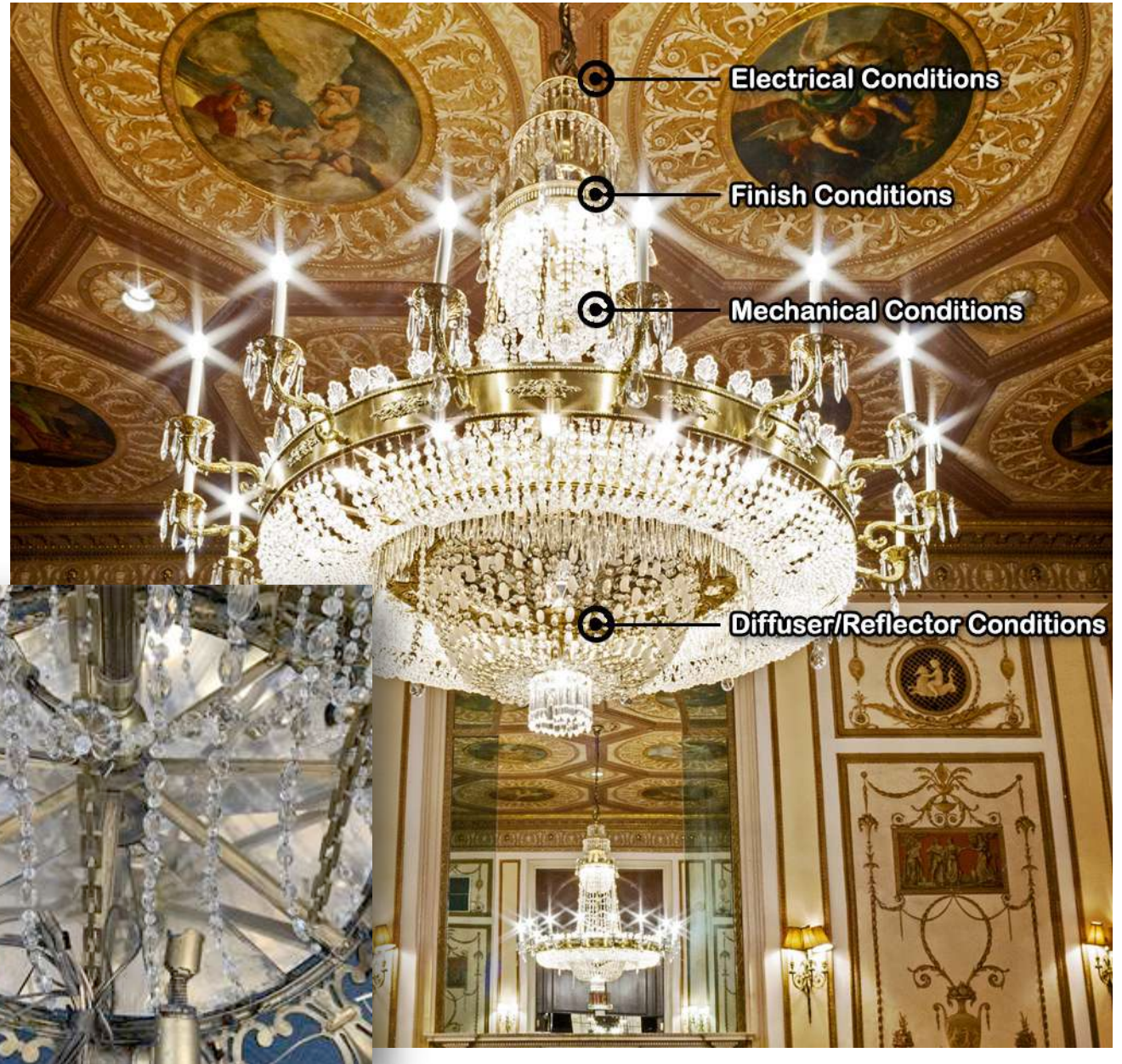
Work Scope:

- (1) electrical outlet on Component B19 not previously in use and will be removed.



Luminaire Survey

- Mechanical Condition
- Finish Condition
- Electrical Condition
- **Diffusers/Reflectors Condition**



Luminaire Survey

- Mechanical Condition
- Finish Condition
- Electrical Condition
- Diffusers/Reflectors Condition
- **Foot Candle Measurements & Light Levels**

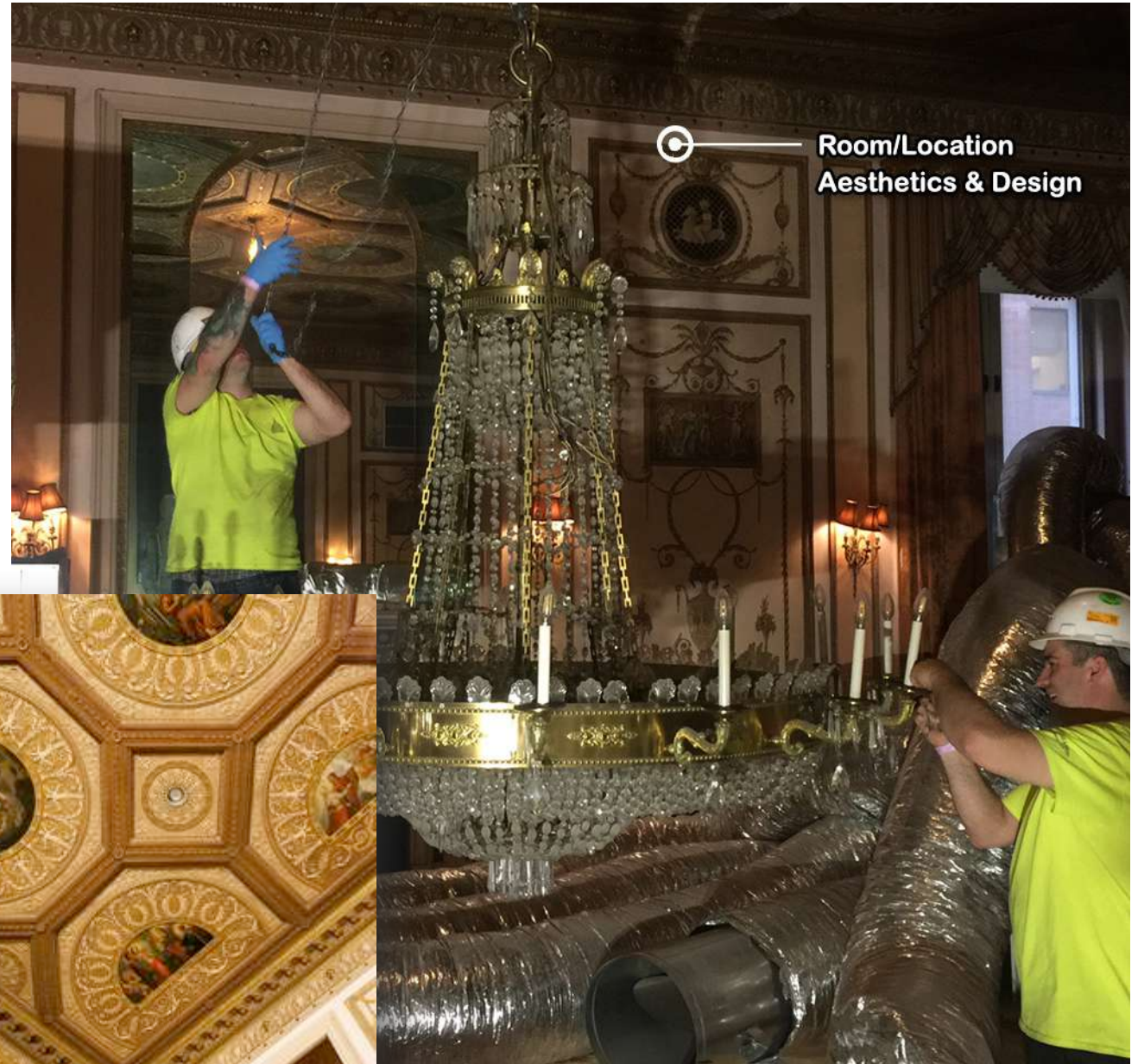


© Foot Candles Measurements & Light Levels



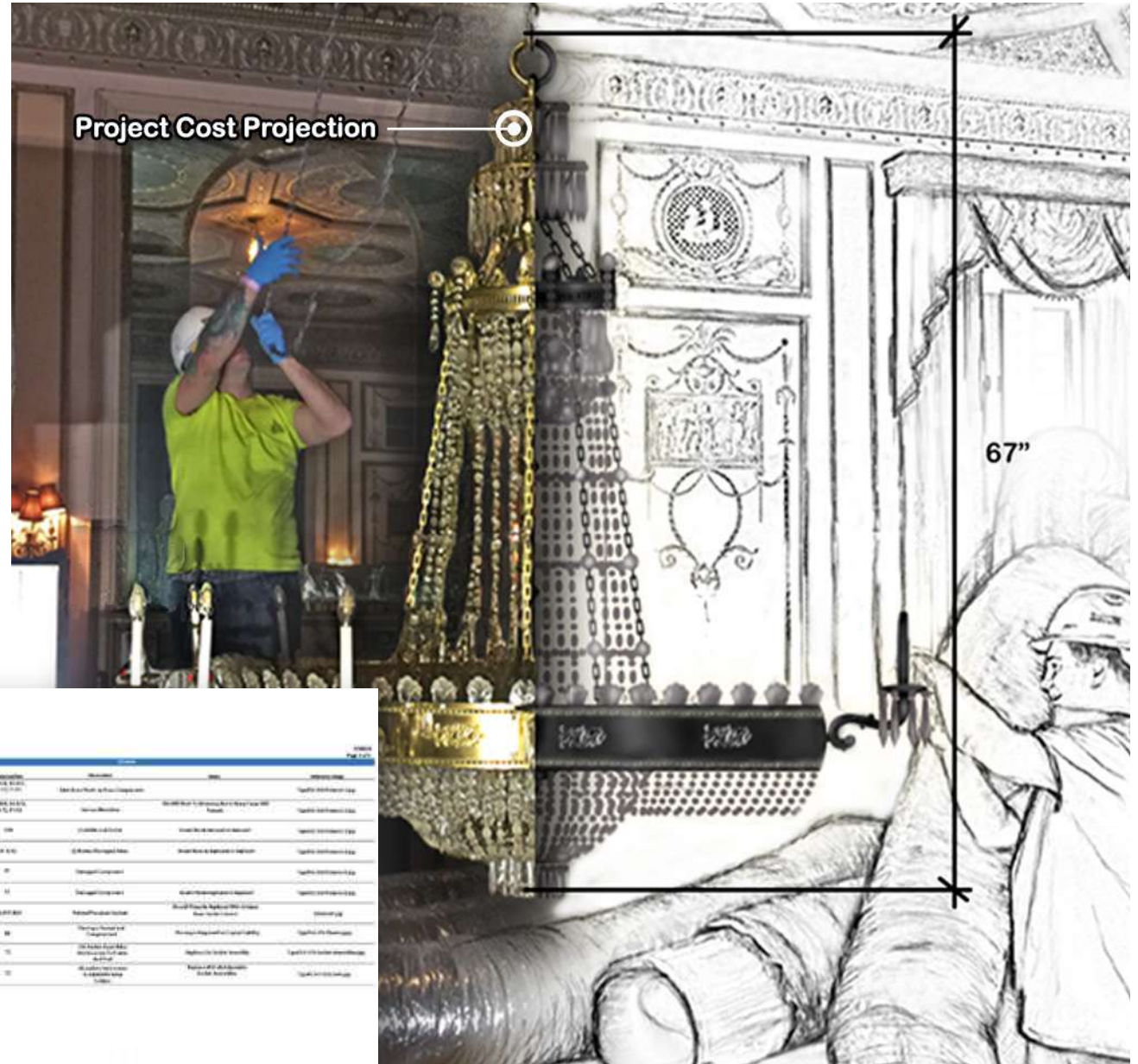
Luminaire Survey

- Mechanical Condition
- Finish Condition
- Electrical Condition
- Diffusers/Reflectors Condition
- Foot Candle Measurements & Light Levels
- **Room/Location Aesthetics**



Luminaire Survey

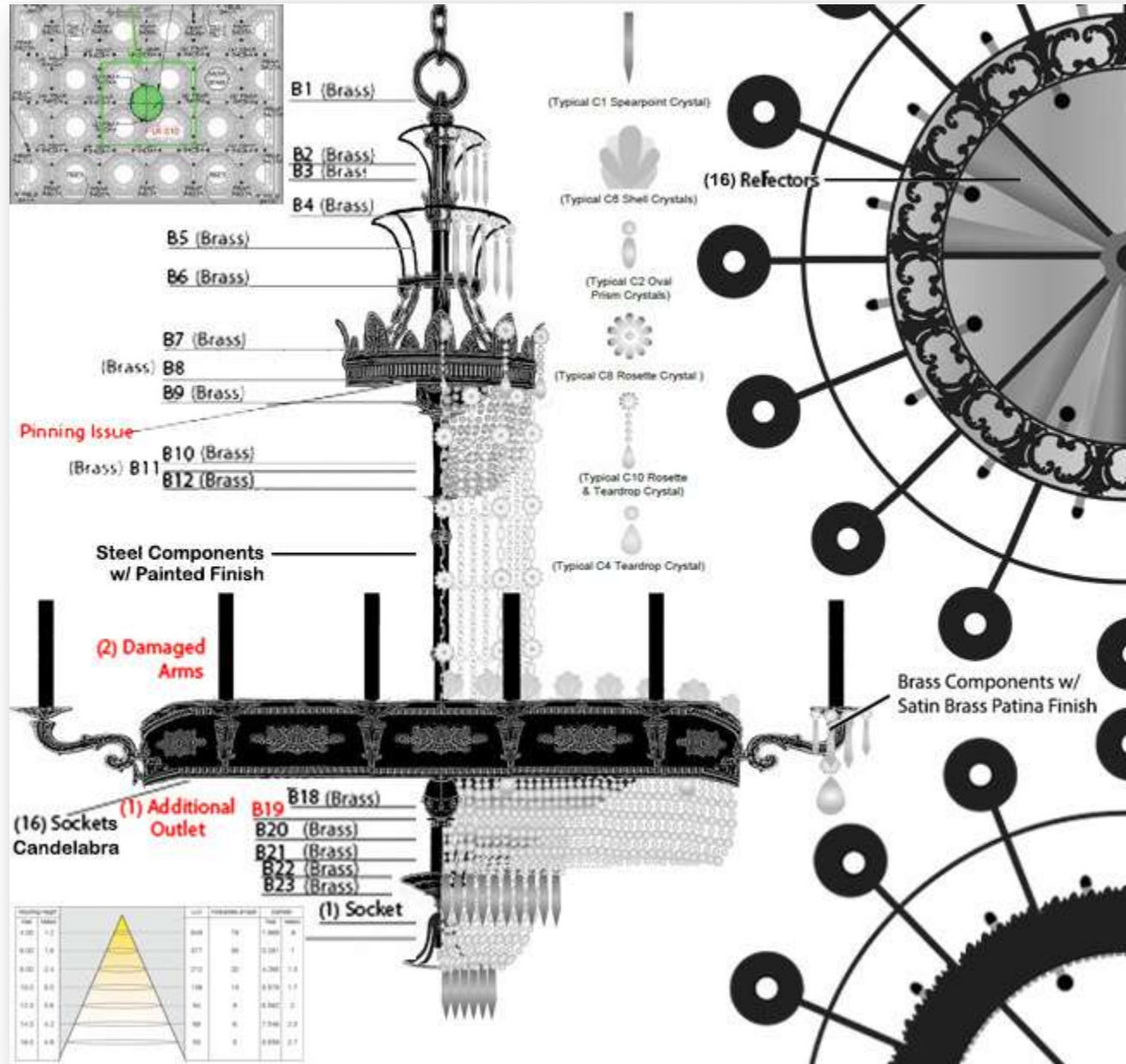
- Mechanical Condition
- Finish Condition
- Electrical Condition
- Diffusers/Reflectors Condition
- Foot Candle Measurements & Light Levels
- Room/Location Aesthetics
- **Project Cost Projection**



Item	Quantity	Description	Unit	Price	Total
1	1	1000W LED Flood Light	Each	100.00	100.00
2	1	1000W LED Flood Light	Each	100.00	100.00
3	1	1000W LED Flood Light	Each	100.00	100.00
4	1	1000W LED Flood Light	Each	100.00	100.00
5	1	1000W LED Flood Light	Each	100.00	100.00
6	1	1000W LED Flood Light	Each	100.00	100.00
7	1	1000W LED Flood Light	Each	100.00	100.00
8	1	1000W LED Flood Light	Each	100.00	100.00
9	1	1000W LED Flood Light	Each	100.00	100.00
10	1	1000W LED Flood Light	Each	100.00	100.00



Luminaire Survey



Luminaire Survey Checklist

Project _____ SO# _____ Fixture Type _____ QTY _____

Description Indoor Outdoor Sconce Pendant
 Chandelier Lantern Post Top

Construction Iron Brass Copper Bronze
 Glass Panels Glass Bowl Crystal

Existing Lamp #Sockets _____ Wattage _____ Voltage _____
 Edison Mogul Candelabra CFL HID

Existing Finish Color _____
 Patina Paint Powder Coat Polished

Condition	Poor	Fair	Good	Excellent
Finish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wiring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Specification Development

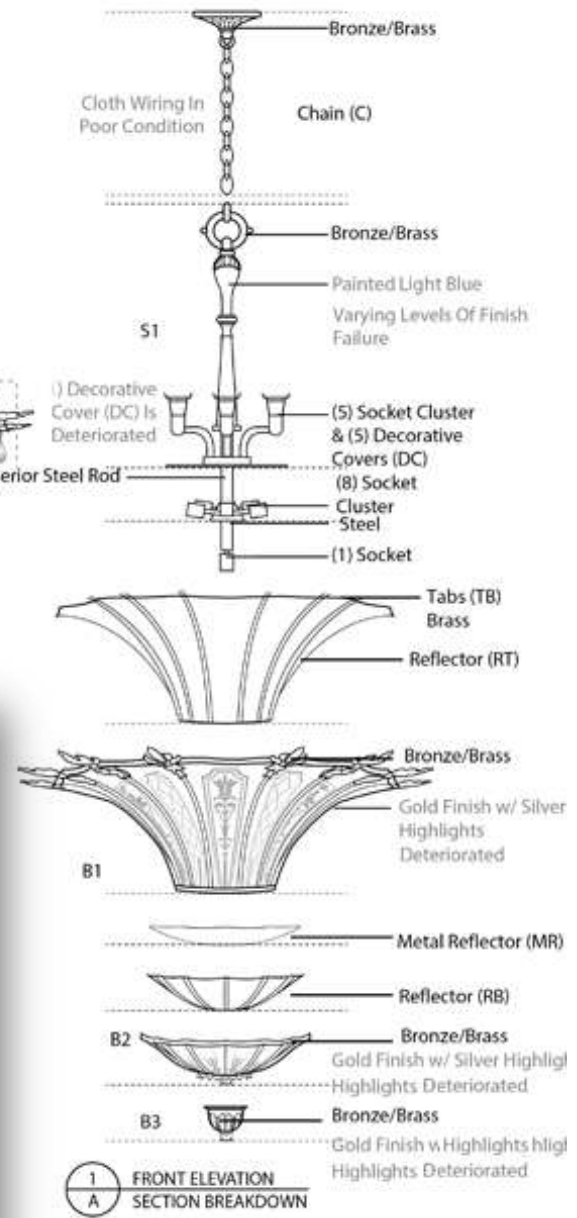


Developing Options



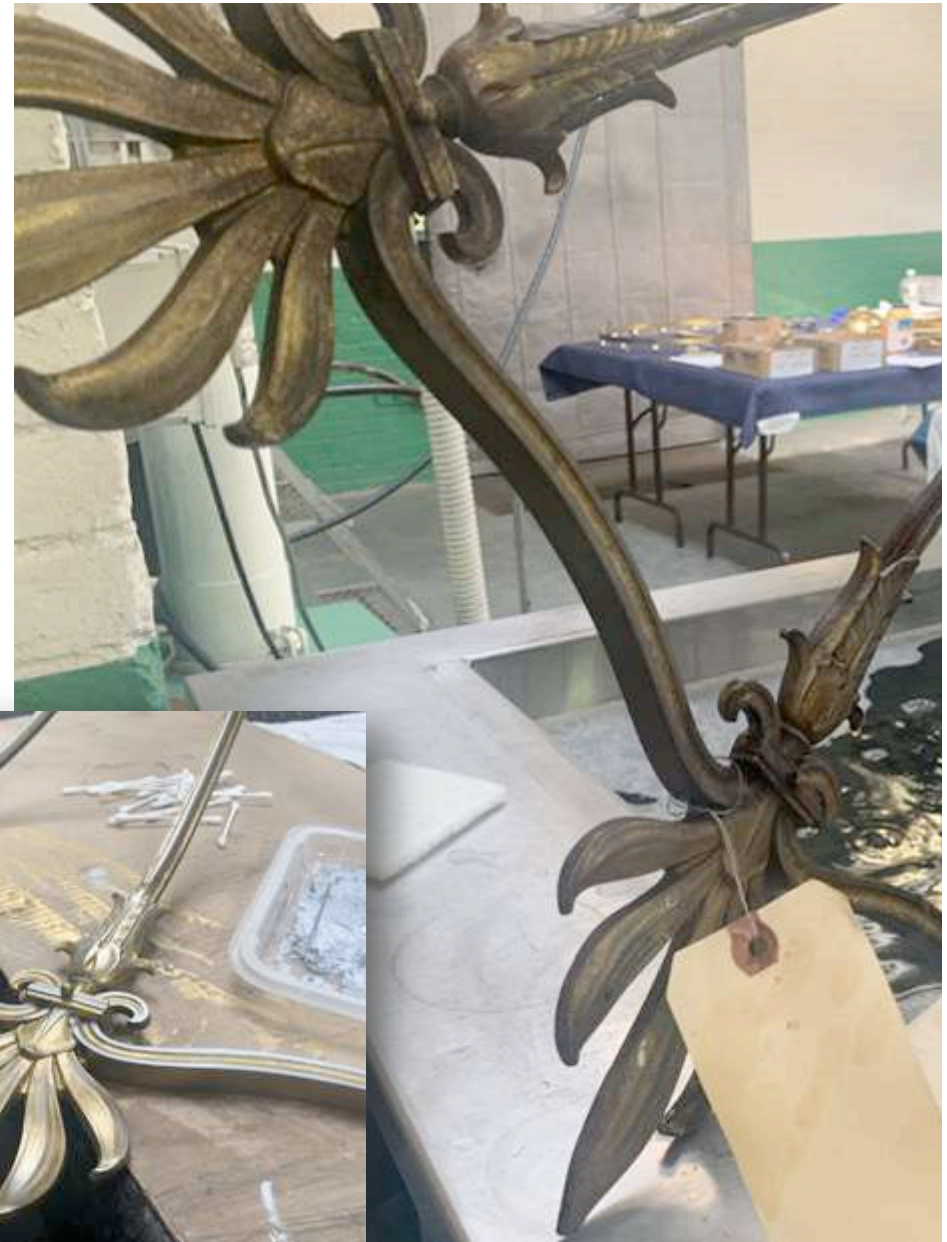
Specification Development

- Mechanical



Specification Development

- Mechanical
- **Finish**



Specification Development

- Mechanical
- Finish
- **Electrical**

Existing Lighting



Incandescent Lamp

Yearly Operating Cost \$10.02
Energy Usage 75w
Brightness (lumens) 1100
Bulb Lifetime 2,000 Hours

Proposed Lighting

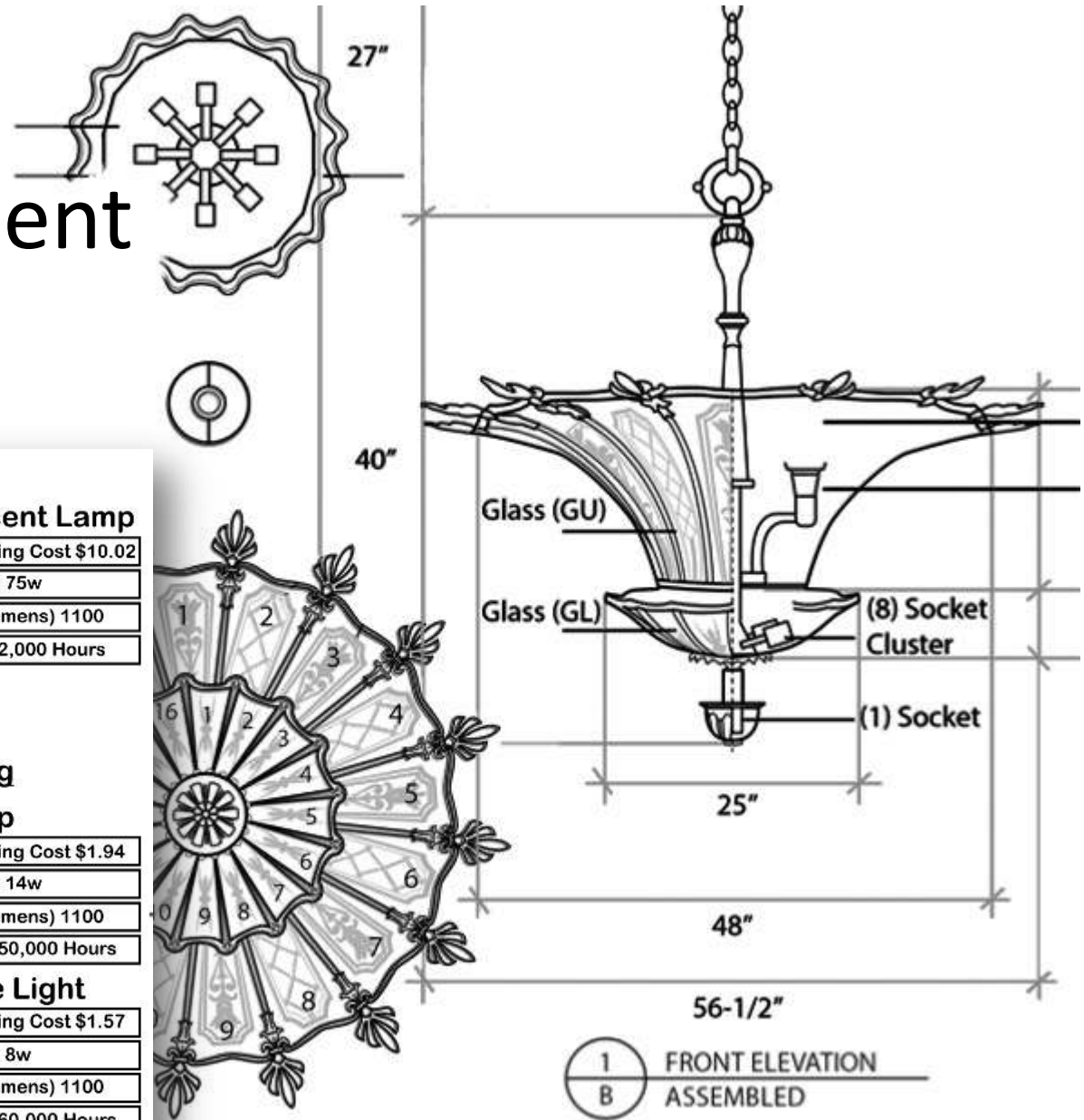


LED Lamp

Yearly Operating Cost \$1.94
Energy Usage 14w
Brightness (lumens) 1100
Bulb Lifetime 50,000 Hours

LED Tape Light

Yearly Operating Cost \$1.57
Energy Usage 8w
Brightness (lumens) 1100
Bulb Lifetime 60,000 Hours



Specification Development

- Mechanical
- Finish
- Electrical
- **Diffusers/Reflectors**



Specification Development

- Mechanical
- Finish
- Electrical
- Diffusers/Reflectors
- **Mock-Ups**



Specification Development

Historic Lighting Restoration
Guidelines - Form 10401

C. Qualification Data:
Grand Light shall submit request for bids, all capabilities, experience of years the firm has include five project documentation of c

1.4 SUBMITTALS

A. Grand Light shall refer samples, submission procedure
B. For custom replicated and electrical construction lampholders, etc.), diffuser materials.
C. For existing luminaires project name, manufacturer mounting details.
D. Finish Samples: Samples shall be submitted for app

1.5 MANUFACTURER

A. Grand Light shall provide and owner project manager will coordinate these trips

1.6 PRODUCT HAND

A. All costs for removing insurance and freight for of the Electrical Contractor re-installation with other crating, insurance and shipping for re-installation shall be responsible for receiving,

Historic Lighting Restoration
Guidelines - Form 10401

PART 1 – GENERAL

The purpose of this document is to specify the scope of work required for the restoration of existing historic lighting fixtures and the replication of others.

1.1 RELATED DOCUMENTS

A. The provisions of the Contract Documents, Drawings & Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates and Addendas apply to this Specification.

1.2 DESCRIPTION OF WORK

A. Provide lighting fixtures as shown on the Drawings and identified as "historic lighting" and herein specified or scheduled.
B. The work to be performed on this project shall include the restoration of existing historic fixtures and the replication of luminaires from both existing fixtures and from photographs, drawings, and historic information available, where actual luminaires do not exist.
C. For new replications of existing and non-existing lighting, work shall include complete studies of photographs, drawings, and available historic information allowing concise preparation and design of engineering drawings with complete bills of materials for the fabrication of each fixture. All ornamental design, structural elements and component parts shall be fully detailed in addition to all anchoring support, wireway, and joinery conditions.
D. Completed fixtures shall meet all applicable codes regarding materials and methods. All NEC guidelines and UL procedures shall be followed.
E. Electrical contractor shall be responsible for verifying existing conditions and coordinate the mounting hardware with Grand Light. It is the responsibility of the fixture manufacturer to ensure that all structural, mechanical, electrical, design, construction and fabrication of fixtures meet all applicable codes as related to public safety concerns. It is the responsibility of the electrical contractor to ensure that fixtures are safely installed with careful attention to fixture weight and mounting, lift and lowering devices and safety/seismic cables, where applicable.

1.3 QUALITY ASSURANCE

A. New and restored historic light fixtures and assembled components shall be wired and tested in accordance with UL standards.
B. Work on historic lighting shall be performed by a qualified Restoration and Replication Manufacturer with no less than ten years successful experience in comparable restoration and replication projects and employing personnel skilled in the restoration and replication processes and operations indicated. Upon Request, Grand Light shall provide proof of qualification.

American Artisans At Work Preserving History

American Artisans At Work Preserving History

Historic Lighting Restoration
Guidelines - Form 10401

B. The Electrical contractor shall be responsible for final lamping adjustment, luminaire adjustment and cleaning. Grand Light shall be on-site during fixture removal to assist with the photo-documentation of the existing condition, location, tagging and supervising the proper handling, disassembly, packing and crating of the historic lighting fixtures. When fixtures are re-installed, Grand Light shall again be on-site to supervise the proper handling, uncrating and assembly of the fixtures prior to their being installed by the Electrical Contractor.

1.7 GUARANTEE

A. Grand Light shall furnish to the owner a written guarantee for luminaires against all defects in materials and workmanship, including without limitation, against failure to function, for two (2) years from date of acceptance.
PRODUCTS Lamps, ballasts, transformers, lampholders, as specified.

1.8 MATERIALS

General:
Utilize materials to match the original or with matching equivalent physical characteristics of strength, finish, resistance to corrosion, etc. Utilize gauges and thickness required to provide the appropriate structural performance and durability.
The restoration of existing luminaires shall consist of, electrical rewiring, new glass globes, cleaning and refinishing. Physical restoration shall consist of the repair or replacement of any parts that are missing, broken, or damaged. Replacement shall match the original parts in strength and appearance, including degree of detail.
Electrical restoration shall consist of the replacement of all electrical components and wiring. Luminaires shall be wired with UL listed components and tested in accordance with UL standards.

1.9 STRUCTURAL MEMBERS

A. All visible structural members shall be fabricated in the material used in the original or, in the case of luminaires based on photographs or drawings of the original, the material that would have been used in a quality luminaire at the time. Thickness and gauges shall be as required for structural integrity.
B. All castings shall be free of pits, scratches, blemishes, parting lines, burrs and internal flaws.
C. Assemblies of structural elements joined by soldering, brazing, or welding shall exhibit no external discoloration at the seams. External fasteners shall be finished to match the parts in which they are installed.

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American Artisans At Work Preserving History



Luminaire Modernization

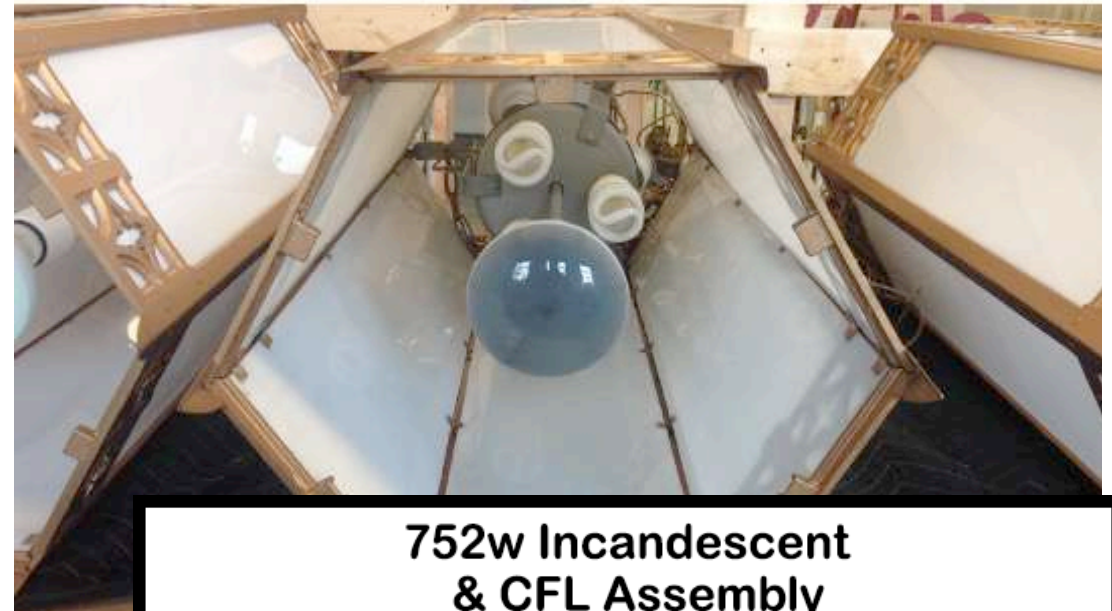


Identifying Solutions



Luminaire Modernization

- Integrated/Dedicated LED

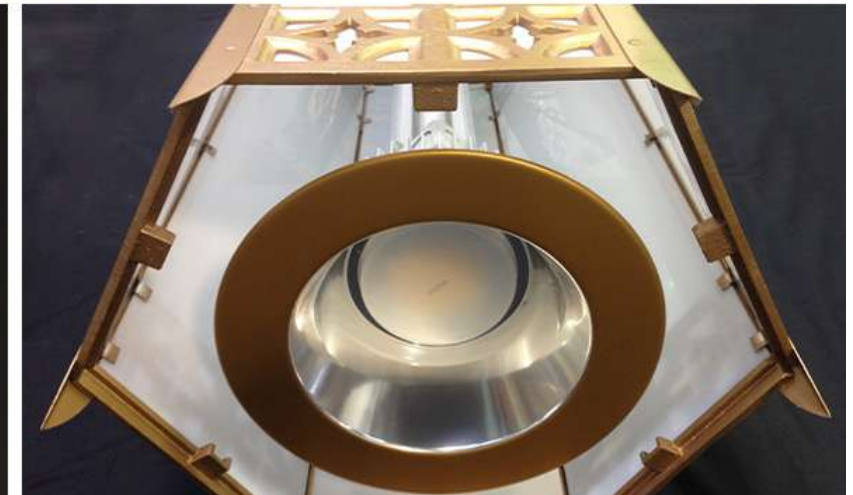
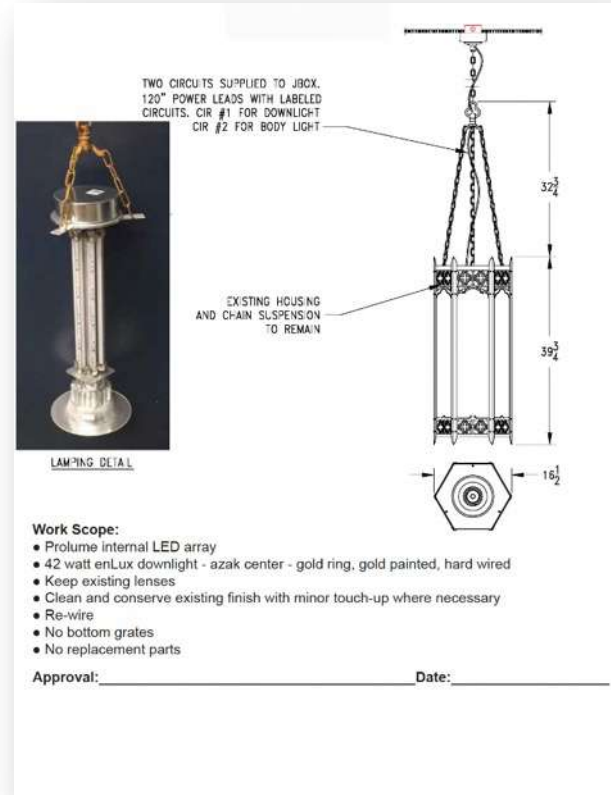


752w Incandescent
& CFL Assembly



Luminaire Modernization

- Integrated/Dedicated LED



752w Incandescent & CFL Assembly > 106w LED Module



Luminaire Modernization

- Integrated/Dedicated LED
- **Screw-In LED**



**400w Metal Halide
20,000 Hours**

Luminaire Modernization

- Integrated/Dedicated LED
- Screw-In LED



Features

- > 120W LED Replaces 400W MH or HPS HID Lamps
- > Rotatable base enables user to accurately direct output to target
- > Designed for Horizontal Installations
- > UL approved for damp environments and enclosed fixtures
- > Advanced active cooling: Active cooling and dynamic temperature control
- > 50,000 hour rated LED life (supported by LM80 and ISTMT reports (see website))
- > 5 Year Limited Warranty - see website for details

Technical Specifications

Models US/CAN	4600K	5000K
CCT	4600K	5000K
Power Consumption	120 watts	120
Replaces	400 MH/HPS	120
Mounting	E39	120
Voltage	120-277VAC (USA) 120-347VAC (CANADA)	120
LED Type	CREE XTB	120
Beam Angle	Type III	120
Dimmable	No	120
Operating Temp	-40°F - +122°F	120
Rated R70 Life	Up to 50,000 Hrs.	120
Warranty	5 Year Limited*	120

LM79 Specifications

	Yes	Yes
Power (W)	120	120
CCT	4144	5000
Light Output	9591	10434
Efficiency	81.49	92.28
THD @ 277V	18.86%	19.23%
PF @ 277V	0.918	0.918
CRI	84.6	89.5
IP	18	0
Duv	0.0008	0.0063

LED Power Consumption

LED Power Consumption (Watts)	HID Power Consumption (Watts)	HID Ballast Power Consumption (Watts)	Total Savings (Watts)	Annual Energy Savings (kWh/day)	Lifetime Energy Savings (over 50,000 hrs)
120	400	80	360	\$202	\$1,980.00

Mounting Orientation

Base Up	Base Down	Horiz
Approved	Approved	Approved

Minimum Fixture Size Requirements (inches)

Length	Width	Height	Cu. Inches
13.26	6.33	6.33	531.3

Lux Distance Curve

400w Metal Halide > **120w LED**
20,000 Hours > **50,000 Hours**



Luminaire Modernization

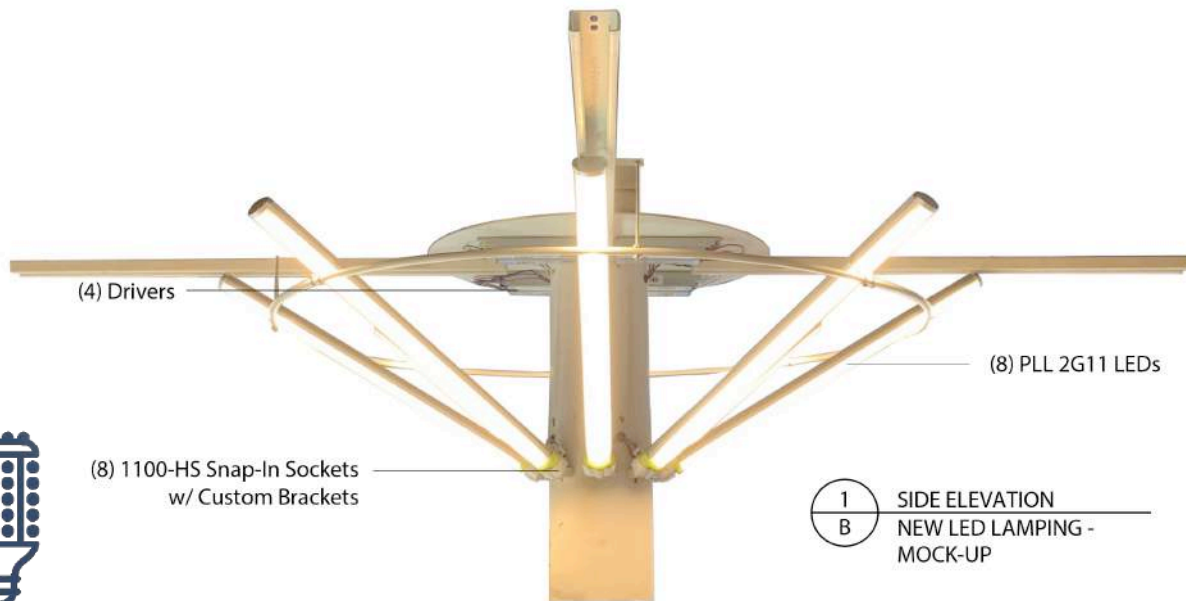
- Integrated/Dedicated LED
- Screw-In LED
- **CFL to LED Conversion**



55w Fluorescent
4,128 Lumens

Luminaire Modernization

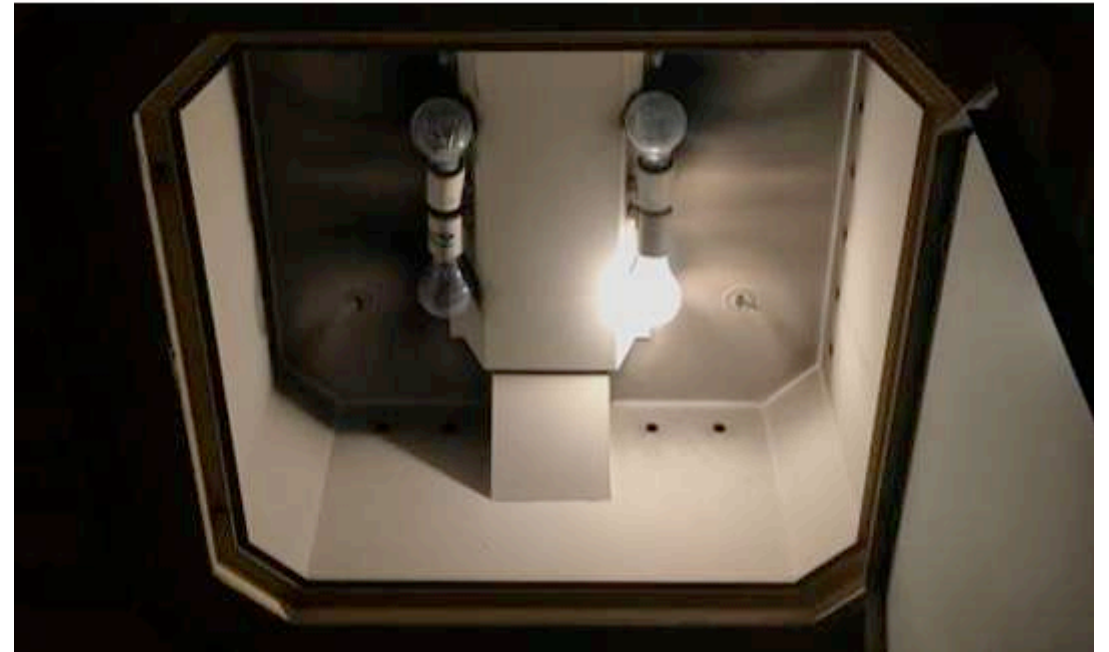
- Integrated/Dedicated LED
- Screw-In LED
- **CFL to LED Conversion**



55w Fluorescent > 50w LED
4,128 Lumens > 5,000 Lumens

Luminaire Modernization

- Integrated/Dedicated LED
- Screw-In LED
- CFL to LED Conversion
- **DMX Controlled RGBW LED**



Luminaire Modernization

- Integrated/Dedicated LED
- Screw-In LED
- CFL to LED Conversion
- **DMX Controlled RGBW LED**



General Specifications

Light Output 80 lumens per watt (lm/w) at 100% dimming Light output through the panel. Actuals available via DALI, DMX and RDM/DMX2+.	Input Voltage 24VDC, 240VAC and 24VDC High Power, 10VDC. Available 100V-180VAC.	Power Factor Power Factor > 0.95
Dimming 0-10V dimming, DALI, DMX, RDM/DMX2+, Magnetic low voltage (MLV), Electronic low voltage (ELV), Remote control plug-in - Infrared plug-in.	Control DALI, RDM/DMX2+, DMX, MLV, ELV, Remote control plug-in - Infrared plug-in.	LEDs SMD, 3535 LEDs from Top 1 Manufacturer. LED CRI > 90. LED Life: > 50,000 hours. PCB available. RoHS available.
Dimensions 12.5" x 12.5"	Weight 2.5 lbs	Mounting Compatible with compatible (standard) panel supplies.

Optional Specifications

COMPATIBLE POWER SUPPLIES:

- 0-10V dimming - DMX/DALI
- Magnetic low voltage (MLV)
- Electronic low voltage (ELV)
- Remote control plug-in - Infrared plug-in

COLOR TEMPERATURES

Red, Green, Blue and White (RGBW) LEDs on the same chip allow designers to adjust panels to any. Perfect for the most versatile and imaginative applications.

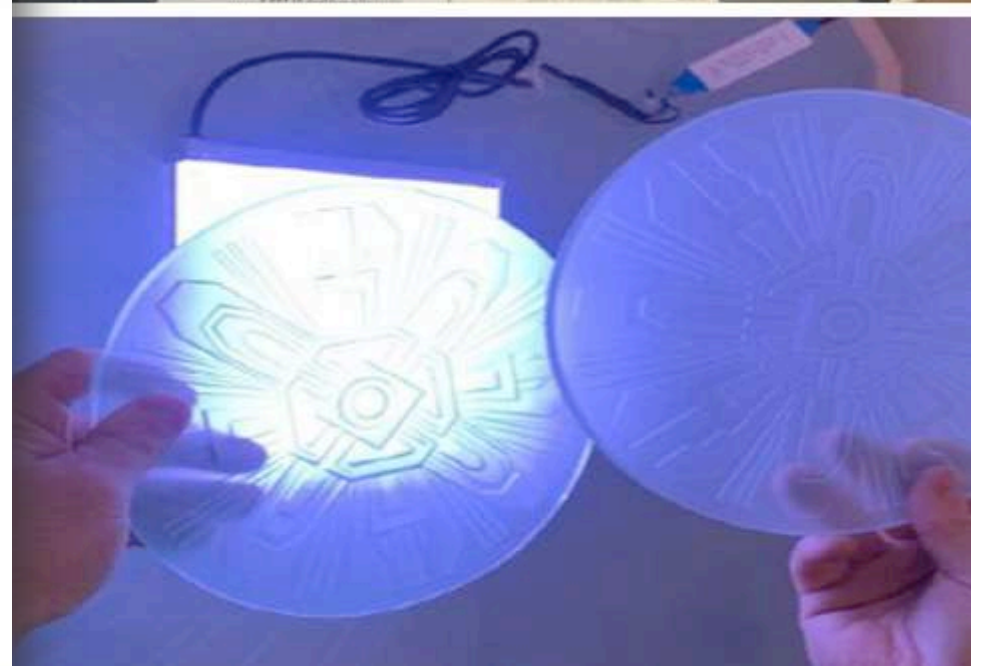
MULTIPLE PANEL MOUNTING OPTIONS:

- 2-shelfies • Stand Offs • Key-Hole Frames
- Aircraft Cattle Mounts • Pre-Drilled holes by factory
- Panels are available on site* (site only app suggested method in brochure)

APPROVALS AND CERTIFICATIONS:

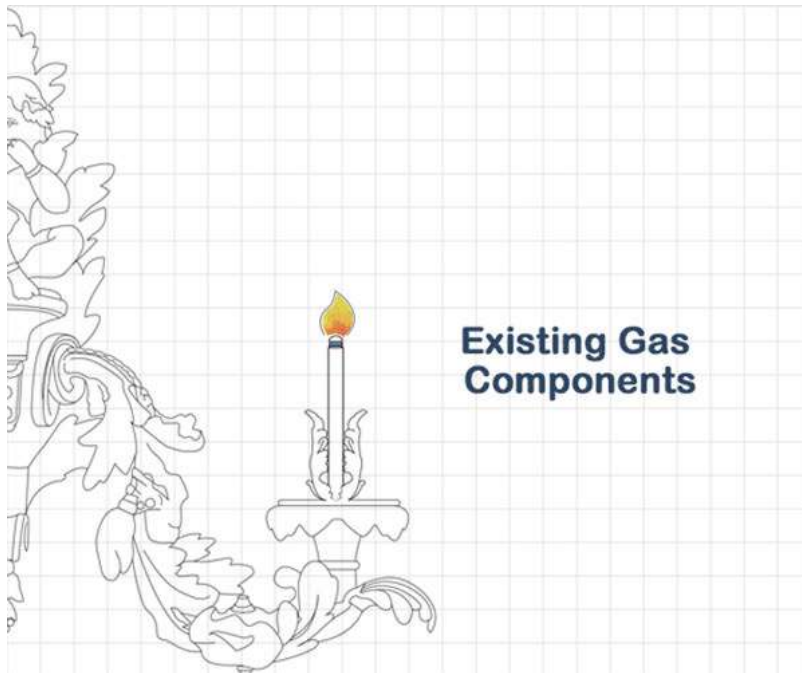
The LightPanel System is UL listed for Architectural applications and UL recognized for signage. Approved power supplies are UL, IETL listed.

UL LISTED CE RoHS



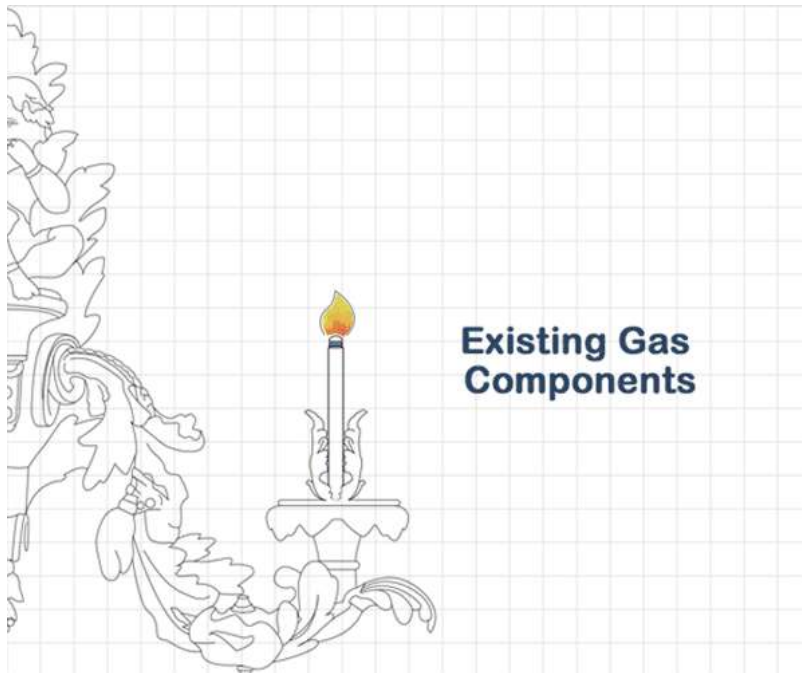
Luminaire Modernization

- Integrated/Dedicated LED
- Screw-In LED
- CFL to LED Conversion
- DMX Controlled RGBW LED
- **Gas To Electric Conversion**



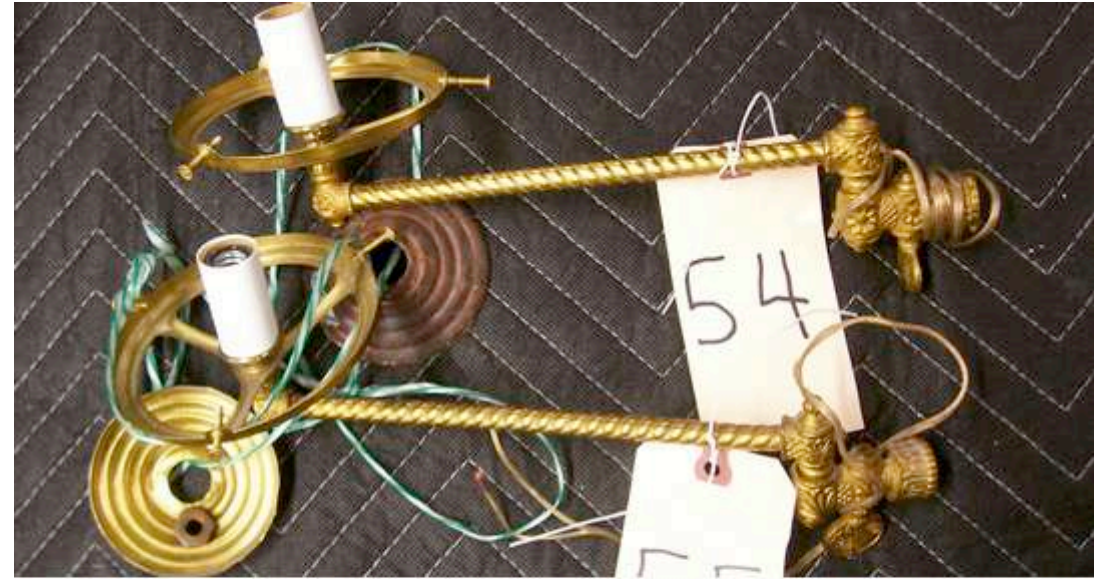
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Luminaire Modernization

- Integrated/Dedicated LED
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- Gas to Electric Conversion
- **Code-Compliant Mounting Options**

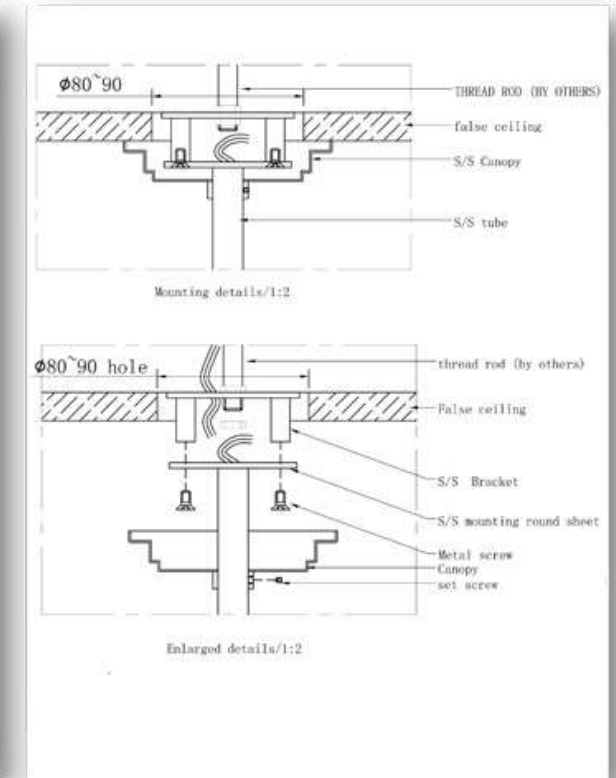
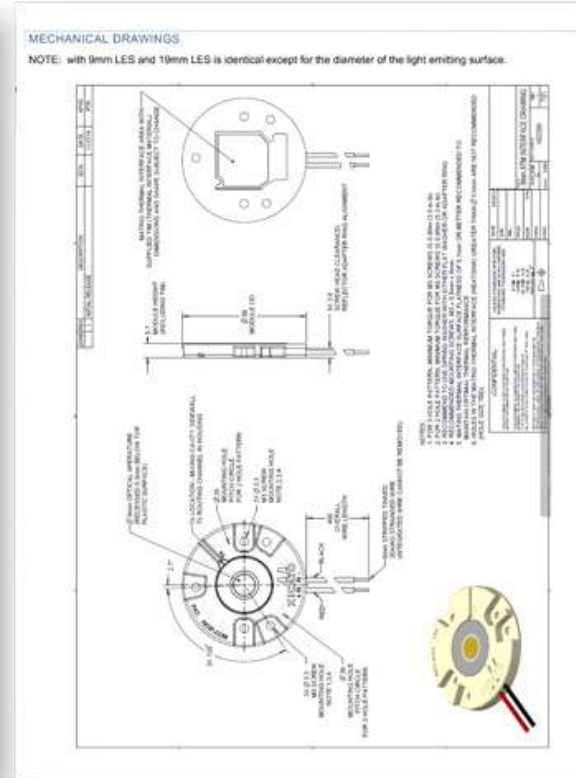
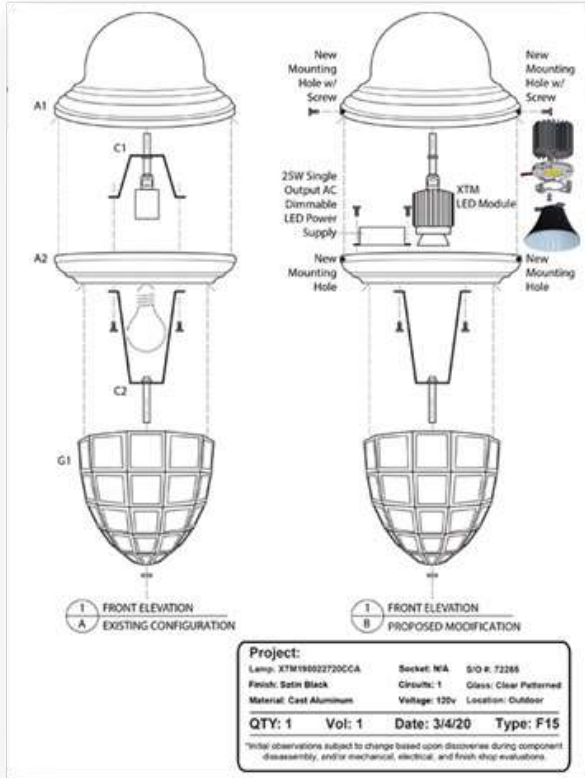


Luminaire Modernization

- Integrated/Dedicated LED
- Screw-In LED
- CFL to LED Conversion
- DMX Controlled RGBW LED
- Gas to Electric Conversion
- **Code-Compliant Mounting Options**



Luminaire Modernization



Logistics



Implementation



Logistics

- **Removal**
 - Disassembly
 - Documentation
 - Packing



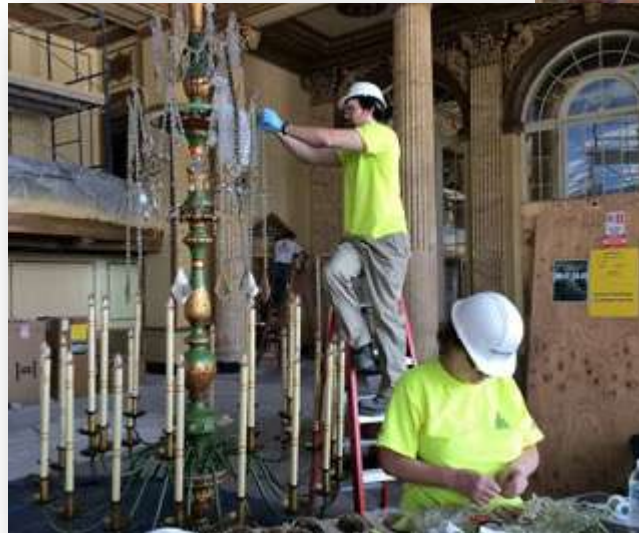
Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- **Transportation**



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- Transport
- **Installation**
 - Instructions
 - Assembly
 - Testing



Project:

Manufacture Operation Procedure
 Scope Of Work As Outlined On Proposal 13541

- 1) will document, package, and transport (5) fixtures. All fixtures will be lowered to ground floor by General or Electrical Contractor. All packaging materials will be provided by restoration facility once removal is complete. See Process 1 (Pg 2-3)
- 2) will conduct factory evaluations and provide a detailed submittal outlining condition of each lighting fixture, including but not limited to the following: See Process 2 (Pg 4)
 - Finish, Mechanical, & Electrical Deficiencies/Damage
 - Fixture Location/Alignment
 - Condition Assessment
 - Inventory of Missing/Damaged Components
 - Structural Deficiencies/Damage
- 3) Conduct restoration to the fixtures according to specified work scope. See Process 3 (Pg 5)
 - Existing metal fixture shall be disassembled, media blasted, ultrasonically and hand cleaned to conserve the existing finish. Apply patina repair where required.
 - Remove paint from component (S1) to resemble historic finish.
 - Application of 2-3 coats of UV resistant protective wax top coating.
 - Hand clean existing glass diffusers.
 - Apply a new replicated pattern to repair/replace existing missing or deteriorated patterns on 70 (GU/GL) panels.
 - Replace clay reflector (RT/RB) with new aluminum reflector with one side blue and the other high reflectance white to resemble look of the historic.
 - Replace and rewire all electrical components with UL listed products and test in accordance with 1599 standards. UL label on all fixtures. Medium base sockets to be utilized.
- 4) will final package, crate and deliver all the fixtures to the job-site in (1) trip for a max of (3) days. The Electrical Contractor shall be responsible for receiving, partial assembly and installation of fixtures. The Electrical Contractor shall be responsible for final tamping adjustment, luminaire adjustment, and cleaning. All anchorage, i.e mounting bolts to be provided by others. will provide a detailed assembly instruction with final delivery for the installation. See Process 4 (Pg 6)



**Manufacture Operation Procedure
 Process 1 (On-Site Removal)**

encourages field technicians to follow the proper procedures for Contractor safe lowering and efficient packaging. This procedure includes partially dismantling, photographing, and proper technique for temporary packaging for safe transport to our restoration facility. Implementation of the following steps will assure the safe and efficient removal of the historic fixtures at Union League Club.

Step 1) Pre-removal documentation and photographs of the existing configuration(s) and condition of each lighting fixture. Photos shall include but are not limited to the following:

- Finish, Mechanical, & Electrical Deficiencies/Damage
- Fixture Location/Alignment
- Condition Assessment
- Inventory of Missing/Damaged Components
- Structural Deficiencies/Damage

Identifying tags need to be added to fixtures and components with their corresponding location, i.e fixture type and location as noted in historic fixture ledger. All tags are attached to components and will not cause any damage to the original finish. Tape of any kind should not be used as it will cause damage to the underlying finish. An Initial Restoration Checklist to be used by the field technician to make any notes for their reference. This will be done prior to removal.



Initial Restoration Checklist

2) All fixtures and components to be lowered (By Electrical Contractor) at designated locations, brought to a designated low traffic, safe area at ground level and suspended above or placed securely on moving blankets, cardboard, wrap, etc. Electrical disconnect of each fixture will be required prior to disassembly and breaking down metal components into sections for safe transport. All partial disassembly that may be required for packaging or transport to be completed at ground level. Field technicians shall photograph fixtures' components in sequence of its removal and as a reference see Image 1 showing staged and labeled historic fixtures for

reference. Artisans will take possession of the removed historic fixtures. Decorative and mechanical fixture components will be labeled and numbered, wrapped with shrink wrap holding them together, or wrapped with moving blankets depending on their size. Loose fixture components such as shades, and light clusters, will be labeled, wrapped with 1/2" bubble wrap and secured with clear carton sealing tape, or wrapped in moving blankets. Components will be placed in a box, a skid, or a 52 x 37 x 36" bin with moving blankets in between and on top of the bin to prevent them from touching, damaging the finish, and/or the component. Please see Image 2 for reference.



**Manufacture Operation Procedure
 Process 1 (On-Site Removal)**

NOTE:

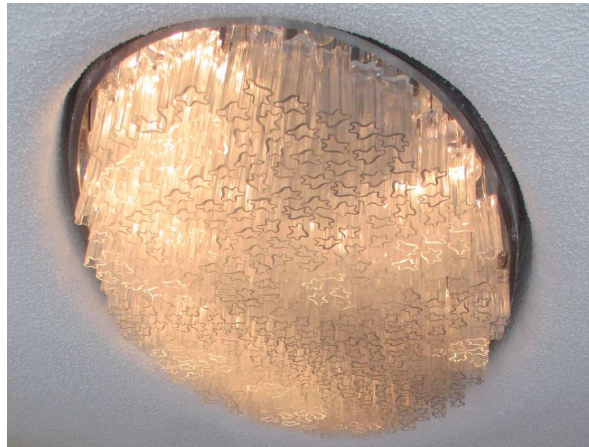
- will be bringing (1) 30' enclosed trailer and will require on-site service entry access for trailer staging and loading. E 37th Street Parking are preferred for trailer parking as well as loading dock access for wheeled bins is required for removal is (1) trips for (1) day max. The use of hand trucks and the customer must be in place prior to arrival.
- (2) separate trips
 - Trip 1: Pick-up/Partial Disassembly of (5) Type 1 fixtures. (1) day max on-site.
 - Trip 2: Deliver (5) partially assembled fixtures for EC installation. (3) days max on site for reassembly of fixtures at ground level.
- All on-site personnel carry OSHA 30 cards and will be present while on site.
- Site orientation, if required, to be conducted upon arrival for fixture packaging



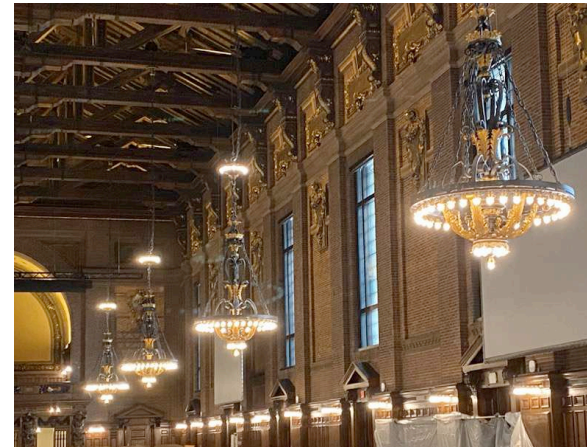
Case Studies



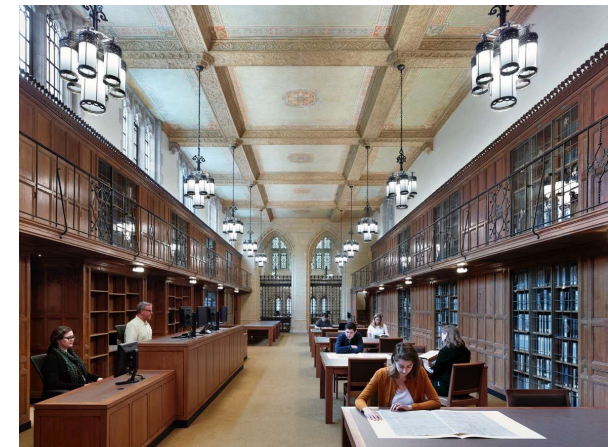
**Massachusetts
State House
Senate Chambers**



**William McChesney
Federal Reserve Building**



**Yale University –
Stephen A. Schwarzman
Center**



**Yale University –
Sterling Memorial
Library**

Massachusetts State House Senate Chambers

Objective: Maintain historical accuracy and honor original design, while transforming the room into a functional and sustainable space

Job Site: Boston, MA

Year Completed: 2018

Architect: CBT Architects

Lighting Designer: George Sexton Associates

General Contractor: Colantonio, Inc.

Consultant: Building Conservation Associates



Luminaire Survey

- Mechanical: Identify deficiencies



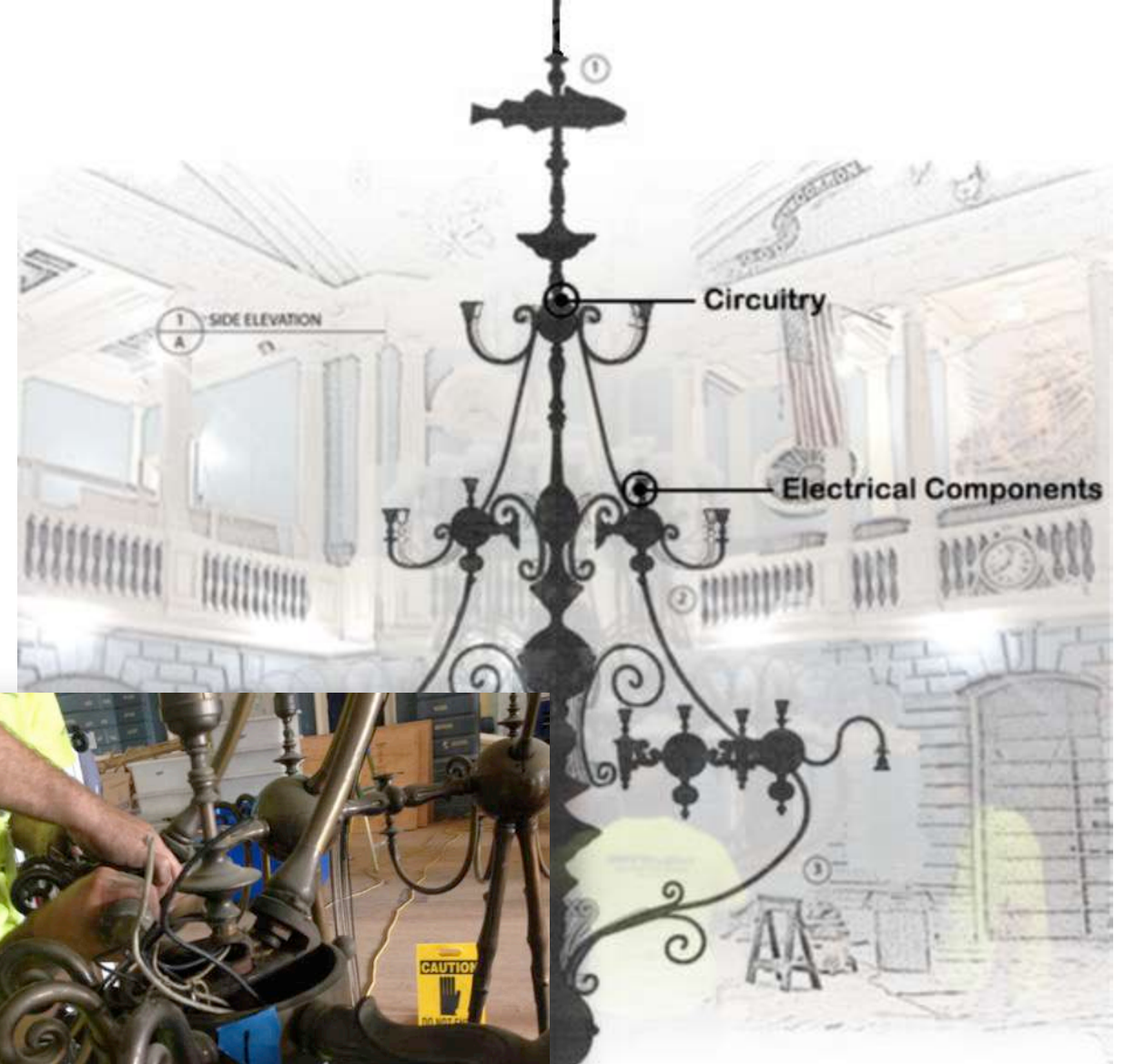
Luminaire Survey

- Mechanical: Identify deficiencies
- **Finish: Evaluate current condition via testing & sampling**



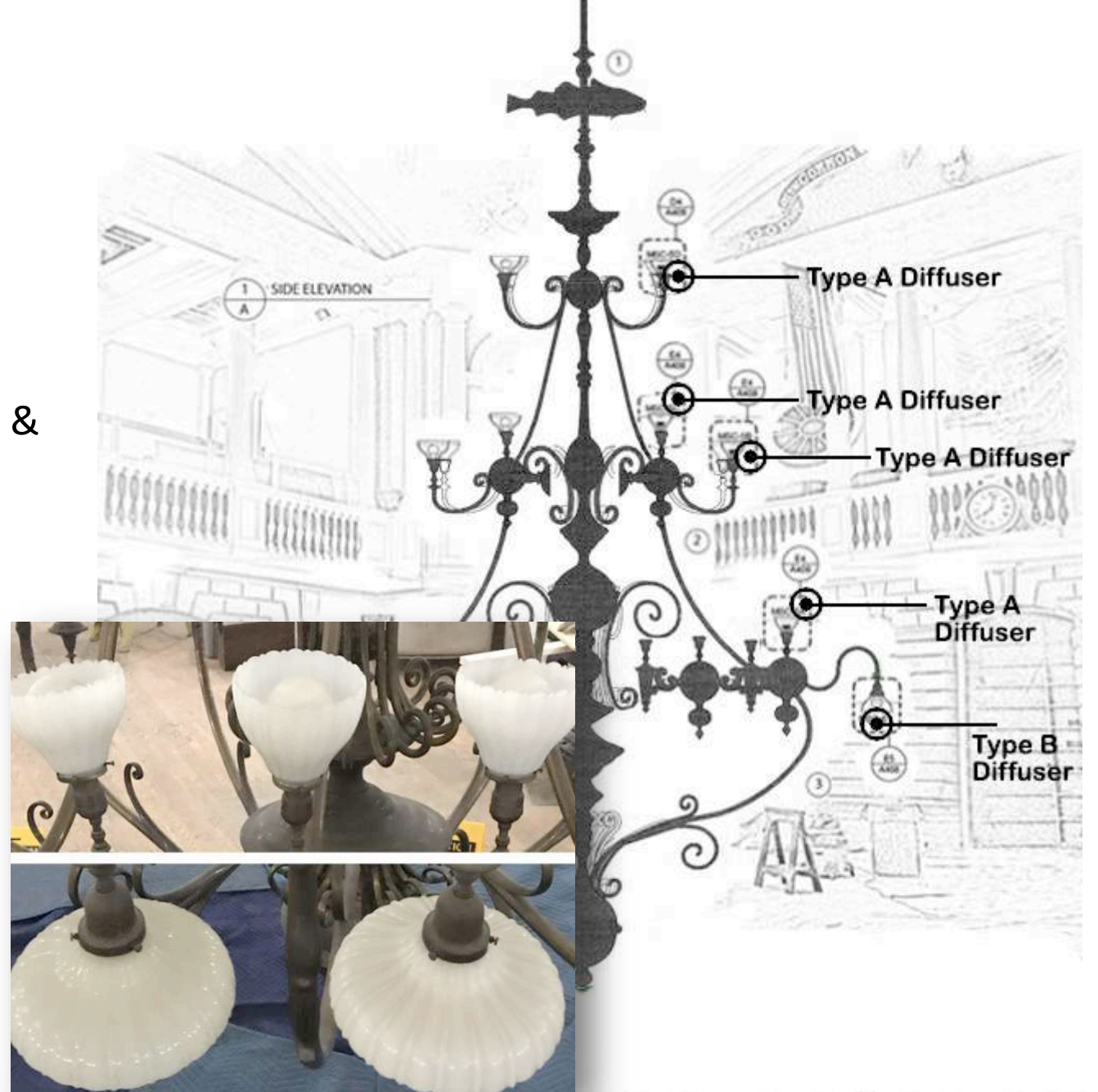
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- **Electrical: Electrical components & circuitry**



Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- **Diffusers: Evaluate lamp diffuser color, translucence, and type**



Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- Diffusers: Evaluate lamp diffuser color, output, and type
- **Foot Candle Measurements & Light Levels**
- **Room/Location Aesthetics**



Specification Development

- Mechanical: Repair or replacement of components with existing mechanical deficiencies



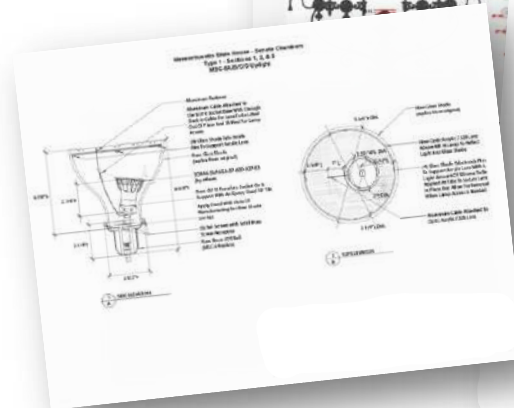
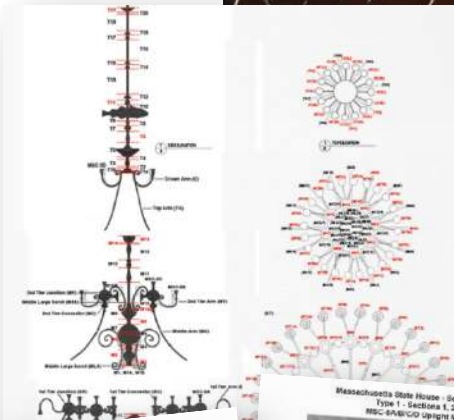
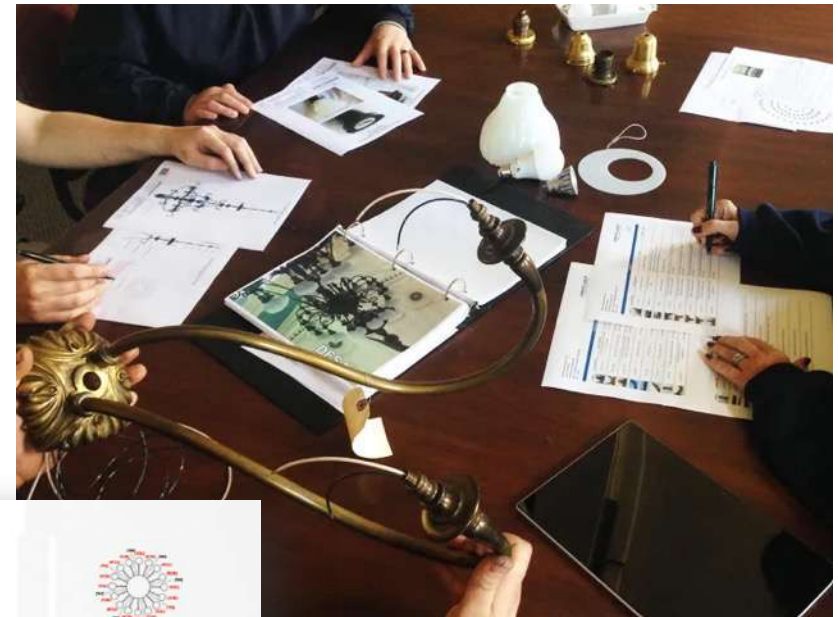
Specification Development

- Mechanical: Repair or replacement of components with existing mechanical deficiencies
- **Finish: Clean & conserve existing finish. All new cast brass components received gold infill.**



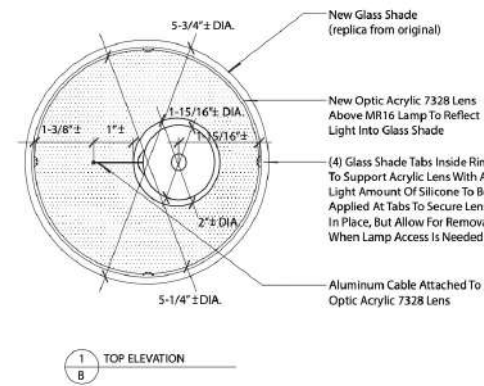
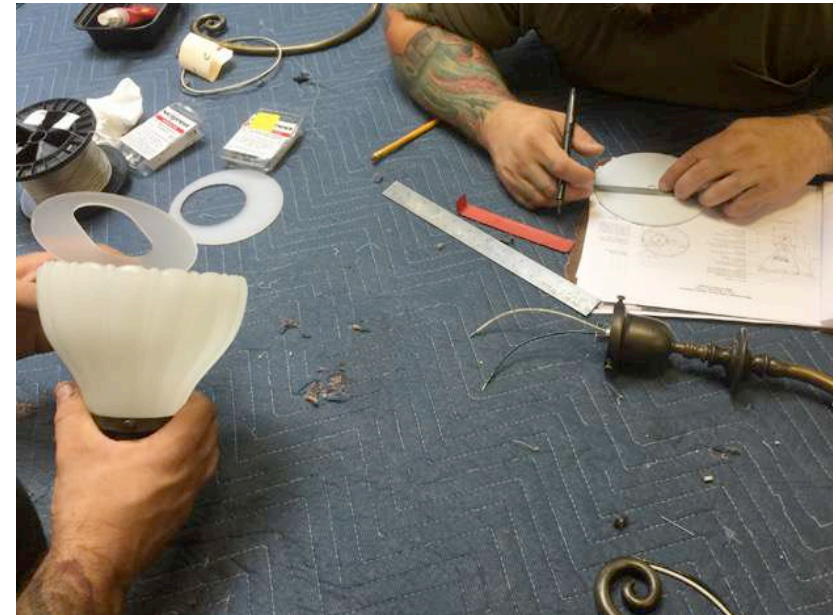
Specification Development

- Mechanical: Repair or replacement of components with existing mechanical deficiencies
- Finish: Clean & conserve existing finish. All new cast brass components received gold infill.
- **Electrical: (3) circuits/zones with (80) LED GU10s (Up-Lights) and (32) LED A19s (Downlights) controlled by a new dimming system**



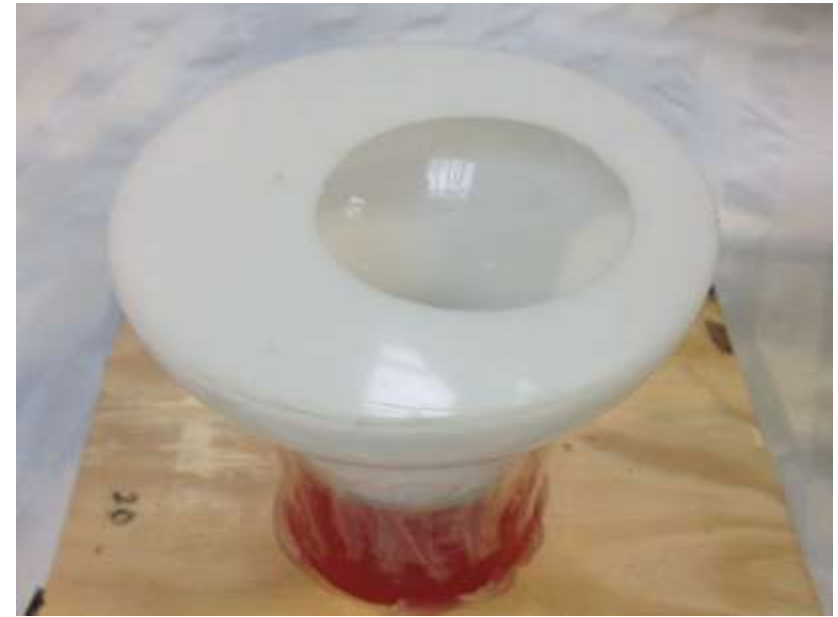
Specification Development

- Mechanical: Repair or replacement of components with existing mechanical deficiencies
- Finish: Clean & conserve existing finish. All new cast brass components received gold infill.
- Electrical: (3) circuits/zones with (80) LED GU10s (Up-Lights) and (32) LED A19s (Downlights) controlled by a new dimming system
- **Diffusers: Add new replicated shades to match original shape & color. Modified to accommodate reflector lens.**



Specification Development

- Mechanical: Repair or replacement of components with existing mechanical deficiencies
- Finish: Clean & conserve existing finish. All new cast brass components received gold in-fill.
- Electrical: (3) circuits/zones with (80) LED GU10s (Up-Lights) and (32) LED A19s (Downlights) controlled by a new dimming system
- Diffusers: Add new replicated shades to match original shape & color. Modified to accommodate reflector lens.
- **Mock-Ups: Test light output, distribution, and diffusion of LED GU10s (Up-Lights) with reflector lens**



Luminaire Modernization

Used new technology and fixed swivels with historically replicated components to modernize fixture.

- Replaced (112) 60W medium-base incandescent lamps
 - (80) GU10 MR16 13W LED lamp w/ adjustable swivels
 - (32) A19 11W LED lamp
- (3) circuits/zones controlled by a new dimming/control system
- Custom fabricated acrylic lens allow through aperture while reflecting to illuminate glass



6,720 Watts > 1,392 Watts



Luminaire Modernization

New permanent winch system housed above the senate chambers.

- Raise & lower chandelier 48ft with control panel
- Prevent damage, pinching, or severing of electrical connections/wiring
- Installation of cable protection ring
- Winch offset on frame to allow for cable to be in center of opening for chandelier



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packaging



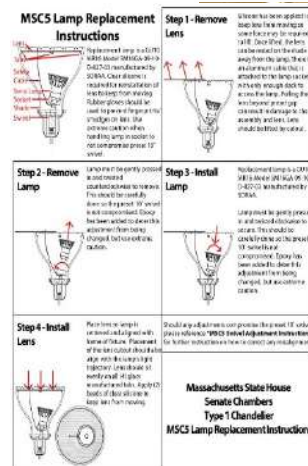
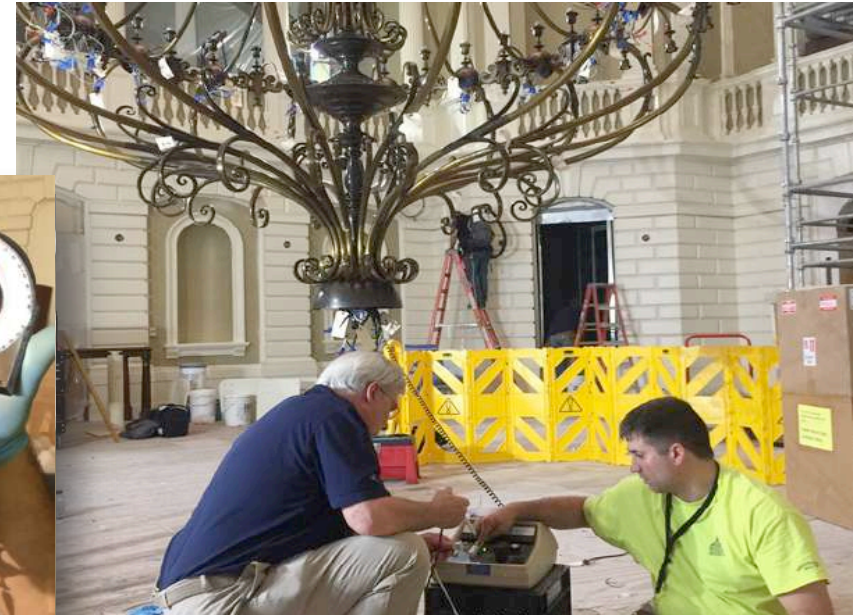
Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- **Transport**



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- Transport
- **Installation**
 - Instructions
 - Assembly
 - Testing









William McChesney Federal Reserve Building

Objective: Preserve the original design of the circa 1970 architecture, while incorporating modern lighting technology requirements.

Job Site: Washington, D.C.

Year Completed: 2020

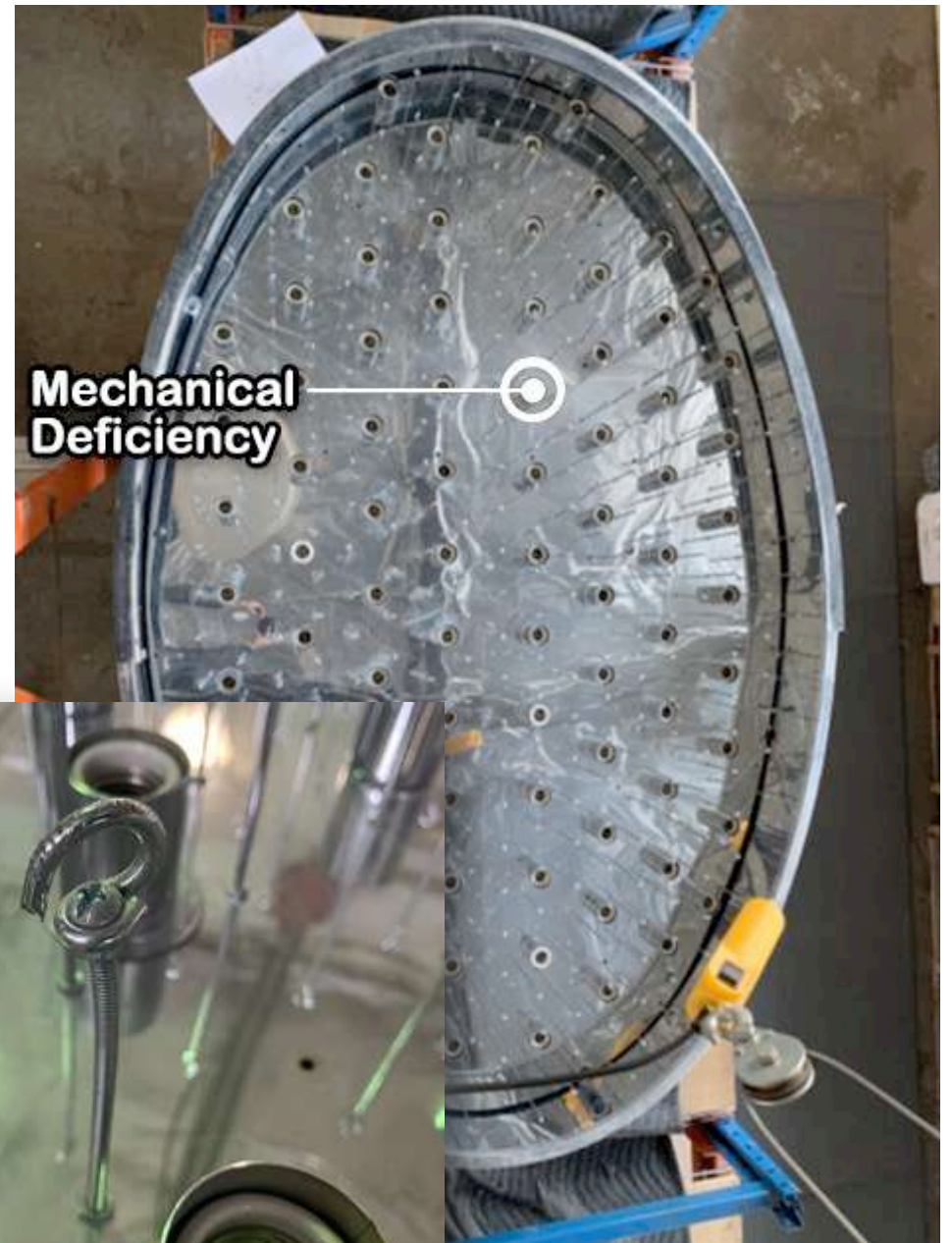
Architect: Shalom Baranes Associates

Electrical Contractor: Singleton Electric Company



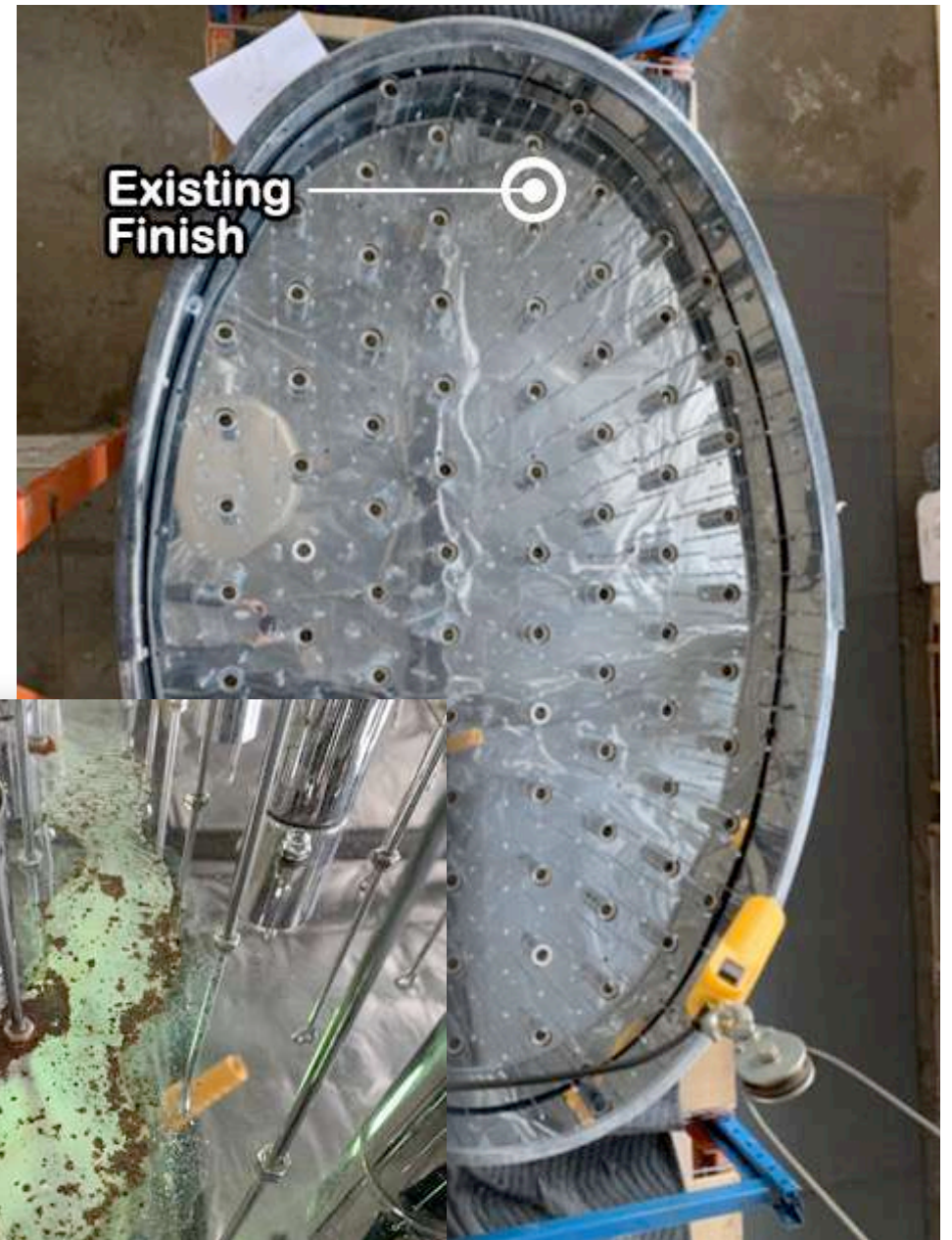
Luminaire Survey

- Mechanical: Identify deficiencies



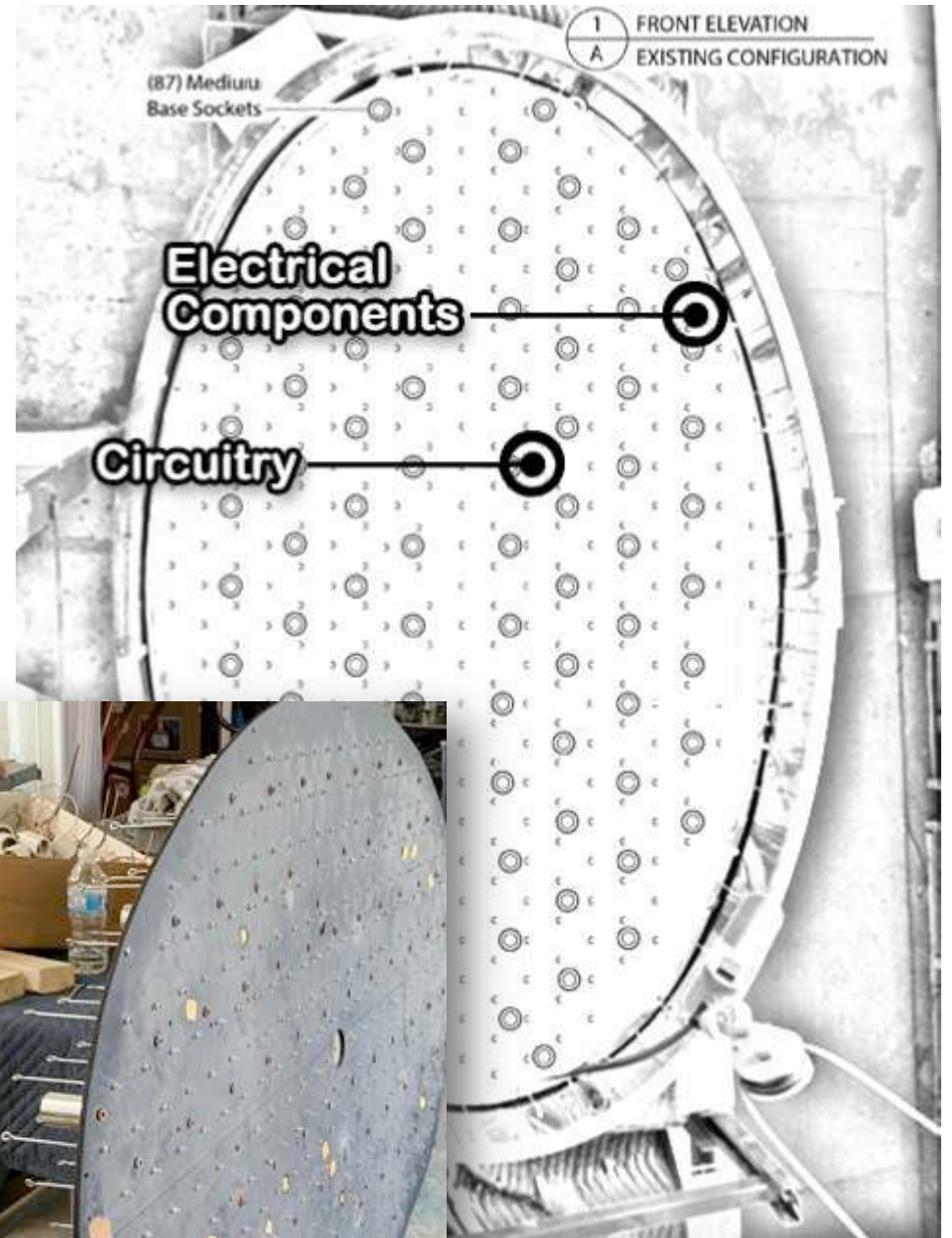
Luminaire Survey

- Mechanical: Identify deficiencies
- **Finish: Evaluate current condition via testing & sampling**



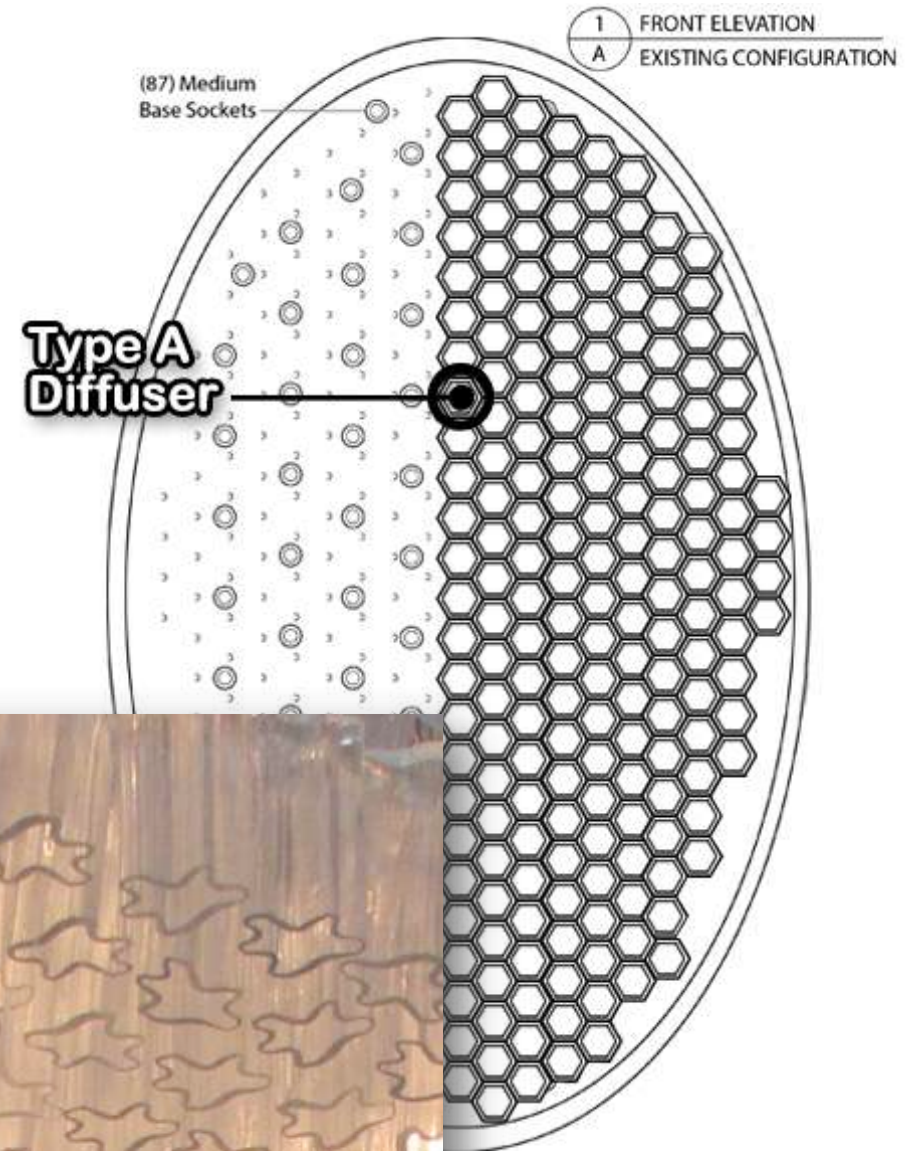
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- **Electrical: Electrical components & circuitry**



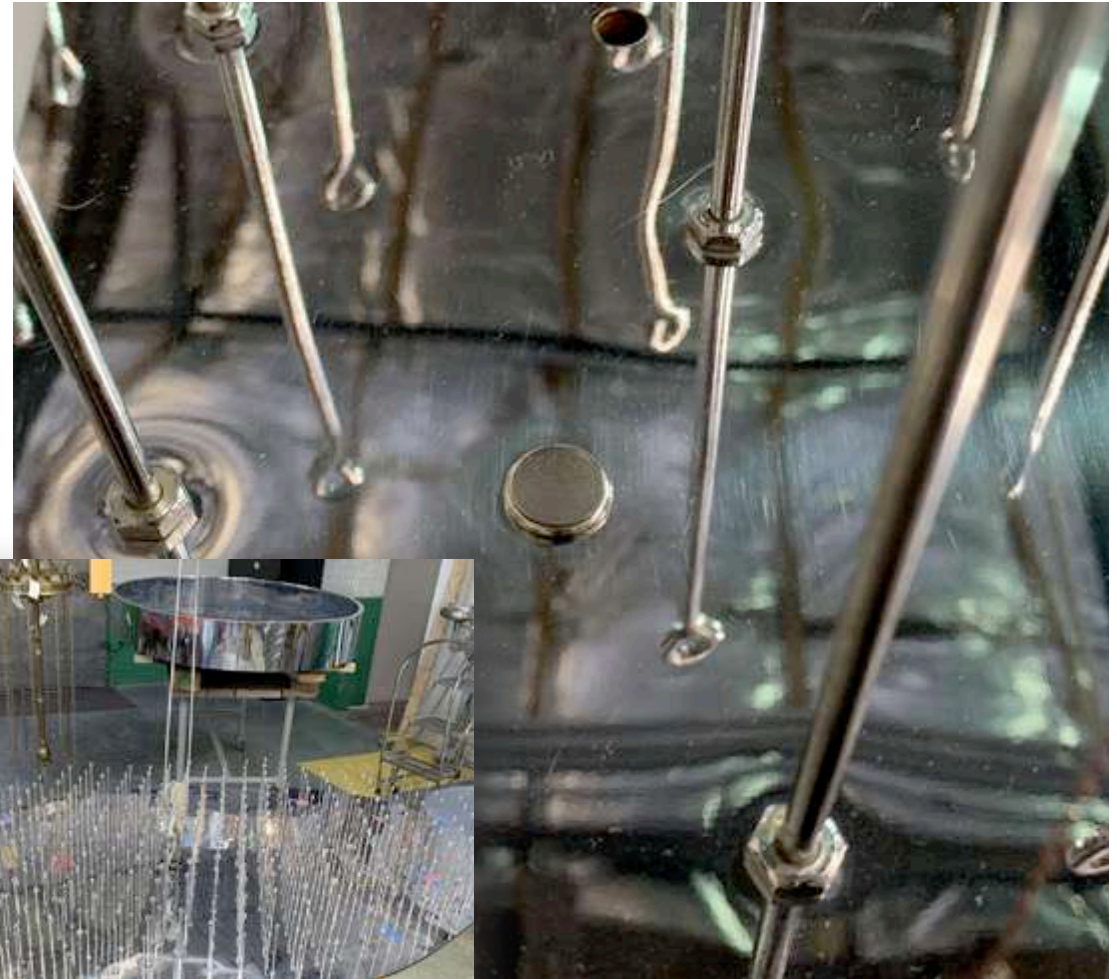
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- **Diffusers: Evaluate lamp diffuser color, translucence, & type**



Specification Development

- Mechanical: Crystal mounting hooks were repaired or replaced. Vacant socket holes were covered with chrome caps.



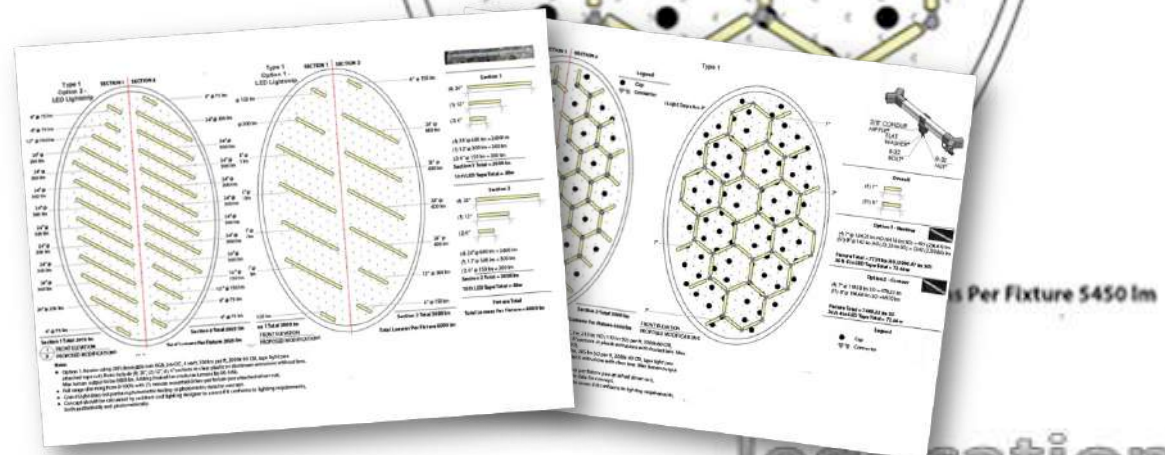
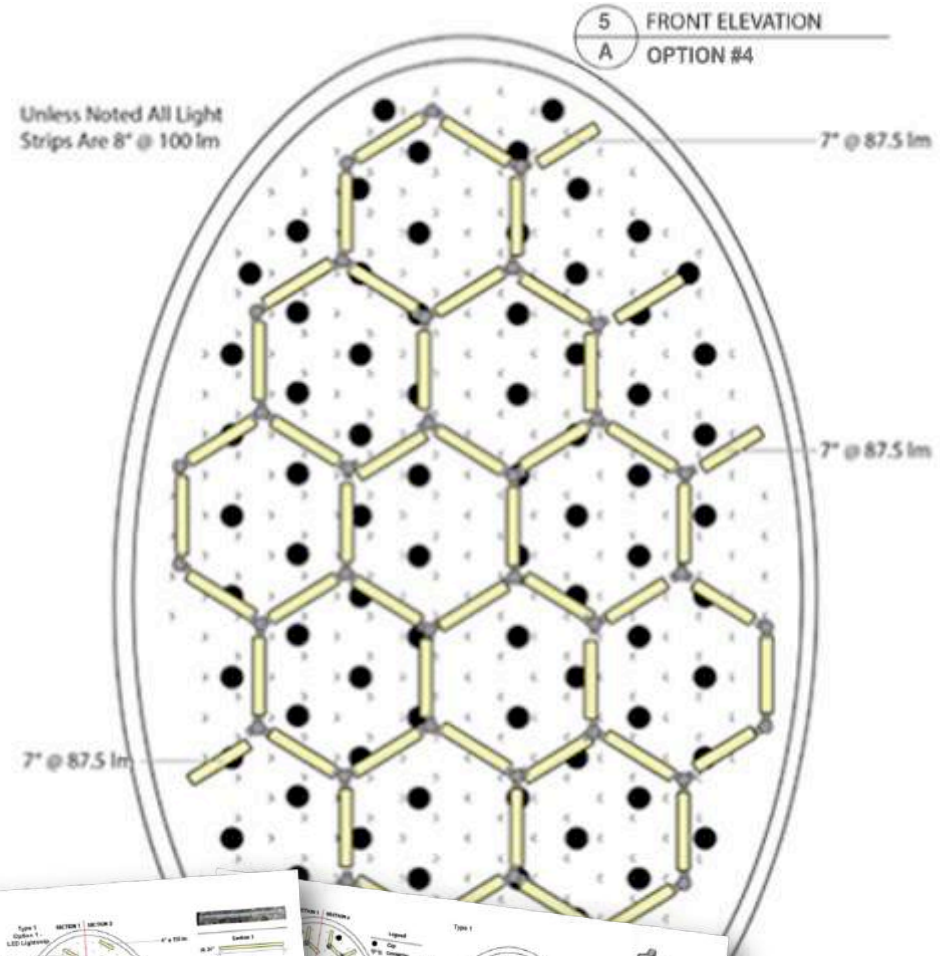
Specification Development

- Mechanical: Crystal mounting hooks were repaired or replaced. Vacant socket holes were covered with chrome caps.
- **Finish: Restore the existing chrome plating.**



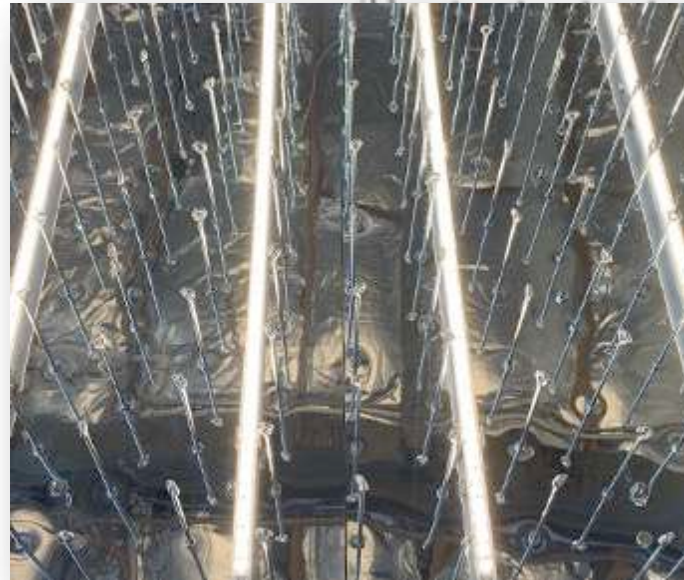
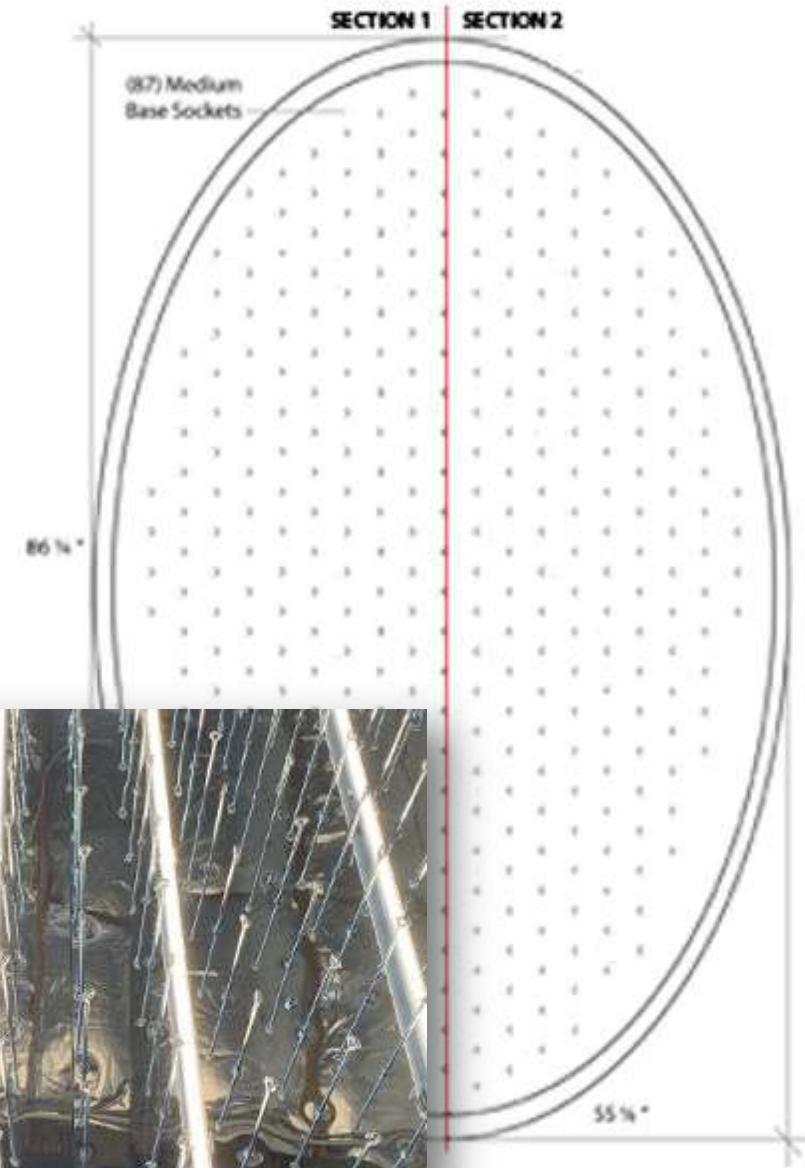
Specification Development

- Mechanical: Crystal mounting hooks were repaired or replaced. Vacant socket holes were covered with chrome caps.
- Finish: Clean and polish the existing chrome plating.
- **Electrical: Replace 88 incandescent sockets with dedicated high output LED strip.**



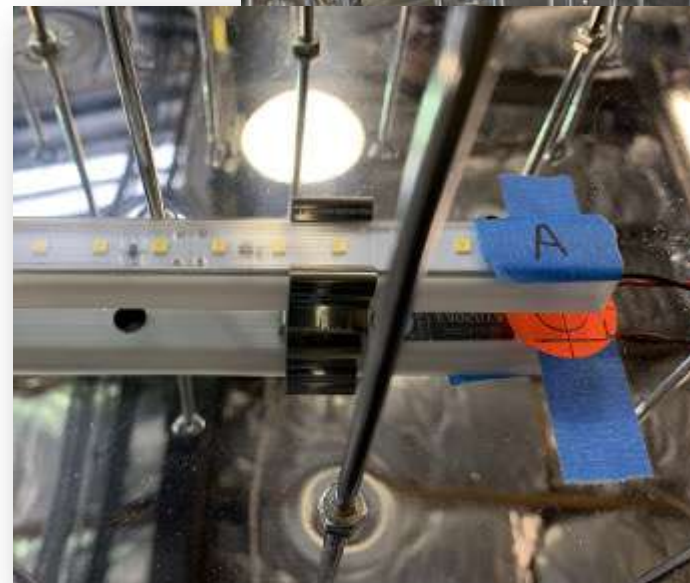
Specification Development

- Mechanical: Crystal mounting hooks were repaired or replaced. Vacant socket holes were covered with chrome caps.
- Finish: Clean and polish the existing chrome plating.
- Electrical: Replace 88 incandescent sockets with dedicated high output LED strip.
- Diffusers: Ensure proper light diffusion of LED hotspots



Specification Development

- Mechanical: Crystal mounting hooks were repaired or replaced. Vacant socket holes were covered with chrome caps.
- Finish: Clean and polish the existing chrome plating.
- Electrical: Replace 88 incandescent sockets with dedicated high output LED strip.
- Diffusers: Ensure proper light diffusion of LED hotspots
- **Mock-Ups: Test light output, distribution, and diffusion of LED Light Strips approved lengths and pattern**



Luminaire Modernization

Linear or module LED lighting that provides energy efficient lighting with a turn key install, full range dimming from 0-100%, and optimal light levels

- Replaced (88) 75W medium-base incandescent lamps
 - 40ft Dimmable Linear 80W LED Light
- Frosted diffusers added to reduce glare with mounting clips for easy servicing



Future Type **Type 1 & 2**
 Project: Singleton Electric Company, Inc.
LOW VOLTAGE LINEAR LUMINAIRE

Used on bridges, in hotels, churches, and cafes around the globe, specifiers recognize the unique benefits that this LED Lightstrip brings to a venue and utilize to create an experience that leave observers simply awestruck.


Designed with a light grade LED light engine, the Lightstrip delivers lighting uniformly second to none. Utilizing the latest LED's from industry leaders and engineering, a very tight beam spread, the Lightstrip ensures an amiable color temperature and full consistency. With a meager power consumption of 3.4 watts per foot for high output (2 watts for Standard Output) the Lightstrip contributes to greater savings in all applications, or watts per foot can be tailored to meet the specifier's exact needs.

All of these features combine to make the Lightstrip an ideal solution for a variety of applications including cook, handheld, accent and exterior up-lighting.

Features

- Made in America craftsmanship and quality
- Tailored fixture lengths, CCT, CRI and watts per foot to meet exact application requirements
- Available in four colored LED options
- Ultra low profile for seamless application integration
- Fixed and articulating mounting options
- Fixtures can be later changed to form a longer run and energized from a single driver

Mechanical Profile & Compliance



UL
 WET
 5 Year Warranty
 DALI-2

Specifications	Color 1	Color 2	Color 3	Color 4
LED Inclusions	100	100	100	100
Rated Output	300	300	300	300
Color & CCT	2700K	3000K	3500K	4000K
Color & CRI	2700K	3000K	3500K	4000K
Rated & Max	1.5W	1.5W	2.0W	2.0W
Rated & Max	200	200	200	200
Watt	100	100	100	100
Beam Angle	24°	24°	24°	24°
Beam	Class 2/Class 1	Class 2/Class 1	Class 2/Class 1	Class 2/Class 1
Roatatable	No	No	No	No
On Board Dimming	No	No	No	No
Radius	0.000000	0.000000	0.000000	0.000000
Construction	Polycarbonate	Polycarbonate	Polycarbonate	Polycarbonate
Mounting	Fixed/Articulating	Fixed/Articulating	Fixed/Articulating	Fixed/Articulating
Fixture Length	3000mm	3000mm	3000mm	3000mm
Ordering Information	100	100	100	100
Power Consumption	100	100	100	100
Color & CCT	2700K	3000K	3500K	4000K
Color & CRI	2700K	3000K	3500K	4000K
Rated & Max	1.5W	1.5W	2.0W	2.0W
Rated & Max	200	200	200	200
Power Supply	100	100	100	100
Operating Voltage	100	100	100	100
Fixture Construction	100	100	100	100
Fixture Mounting	100	100	100	100
Environmental Rating	100	100	100	100
Weight/Dimensions	100	100	100	100
Product	100	100	100	100
Dimensions/Weight	100	100	100	100
Operating Power Range	100	100	100	100
Storage Temperature Range	100	100	100	100
Material	100	100	100	100

6,525 Watts > 80 Watts



Logistics

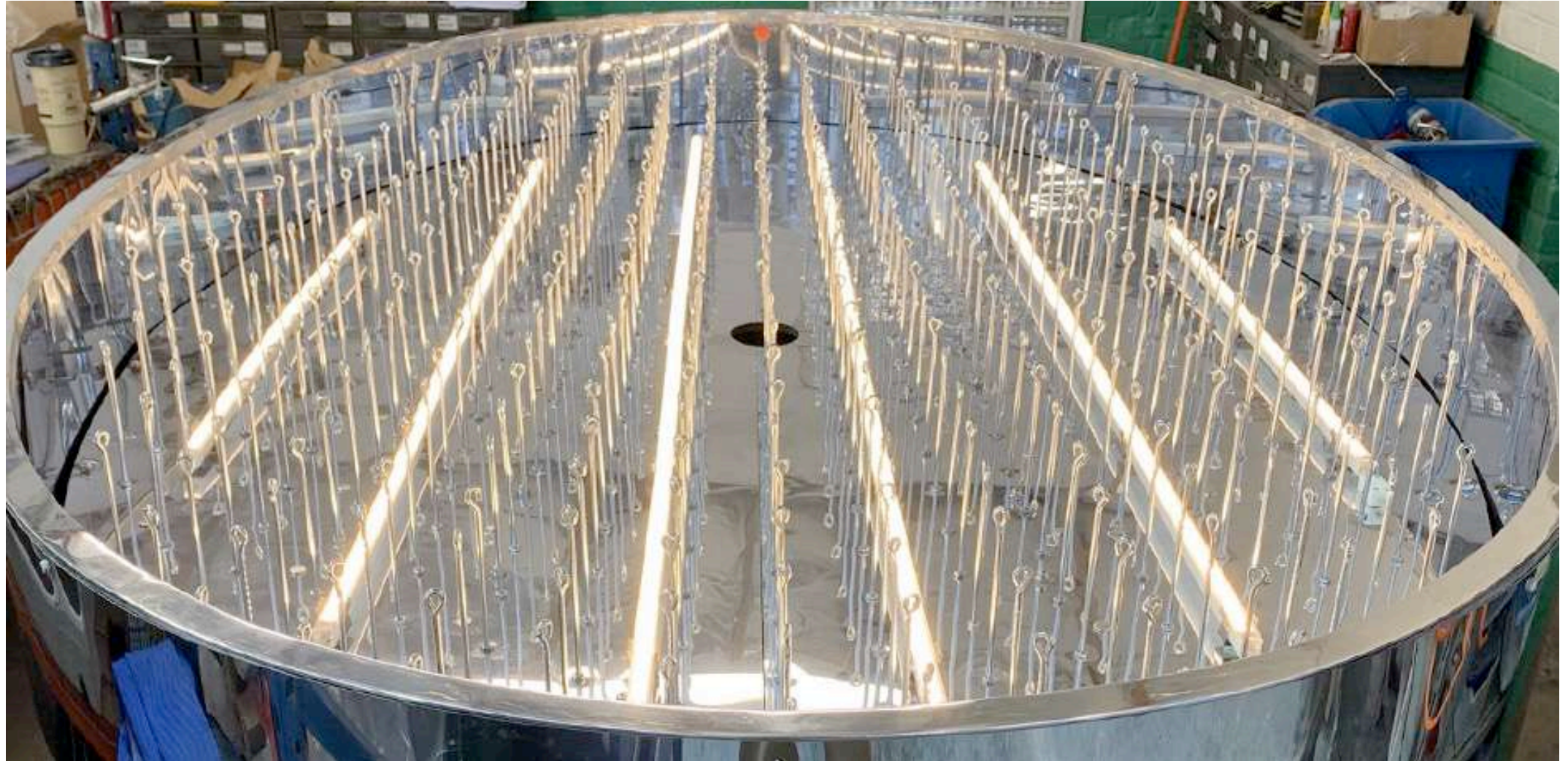
- Removal & Transport



Logistics

- Removal & Transport
- **Installation & Testing**









Yale University – Stephen A. Schwarzman Center

Objective: Upgrade historic 1901 space with significant upgrades to the existing hand-forged iron chandeliers for improved lighting levels, aesthetics, and automation

Job Site: New Haven, CT

Year Completed: 2021

Architect: Robert A.M. Stern Architects, LLP

Electrical Contractor: Ducci Electrical Contractors, Inc.

Lighting Designer: L'Observatoire International

General Contractor: Dimeo Construction Company



Luminaire Survey

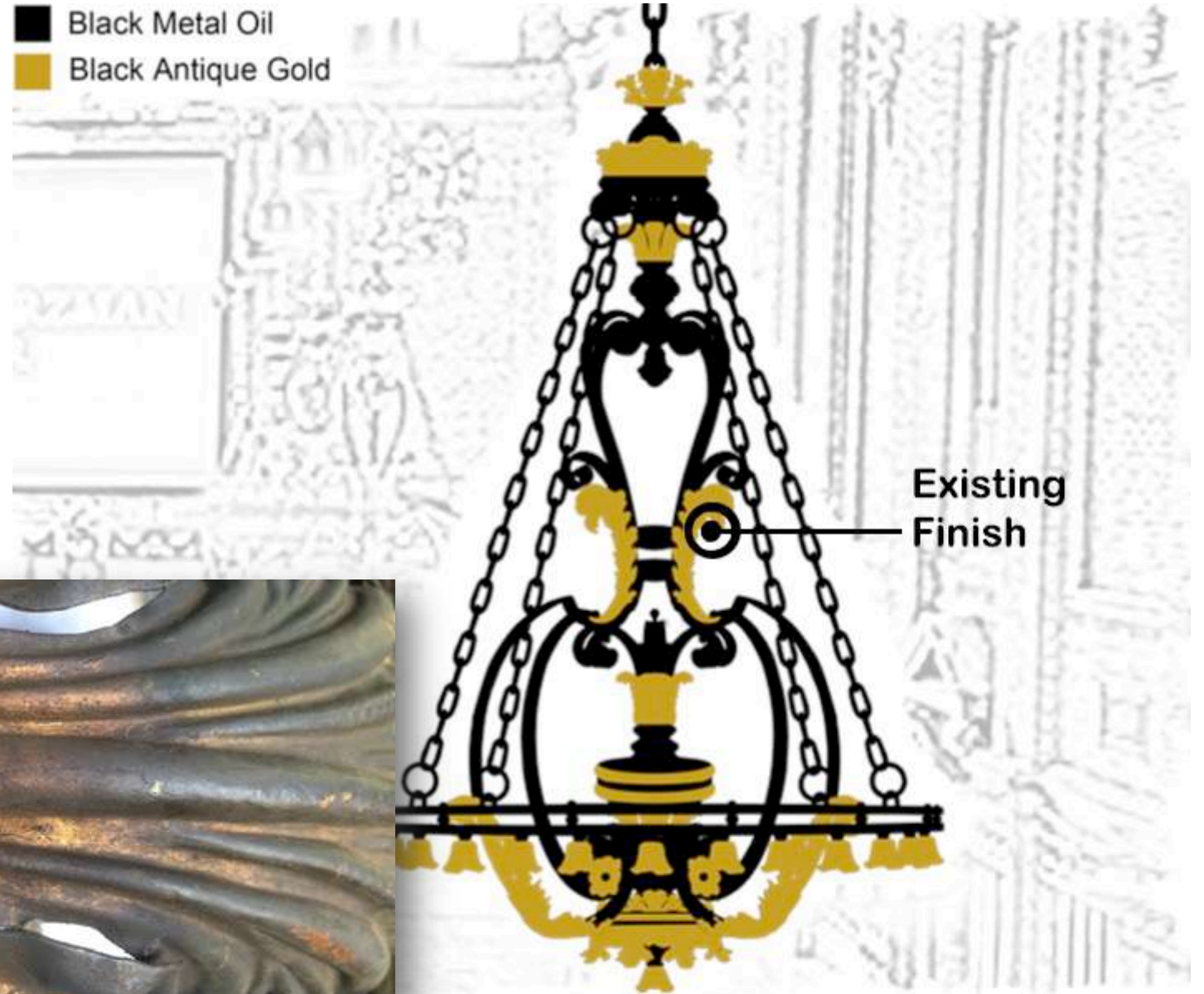
- Mechanical: Identify deficiencies



Luminaire Survey

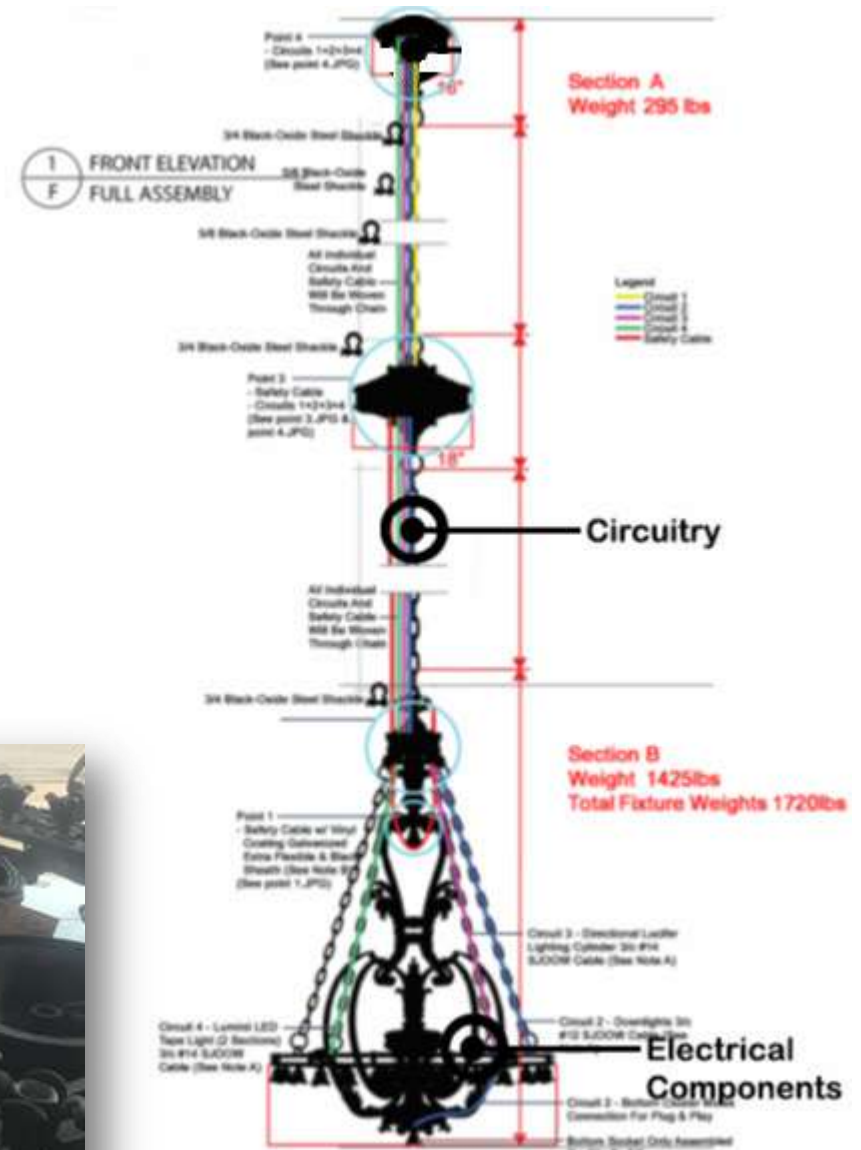
- Mechanical: Identify deficiencies
- **Finish: Evaluate current condition via testing & sampling**

■ Black Metal Oil
■ Black Antique Gold



Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- **Electrical: Electrical components & circuitry**



Inspection On-Site By EC (Typical On Each Circuit At Ring)
 Cable Loop Configuration May Be Single Cable (TBC), On-Site



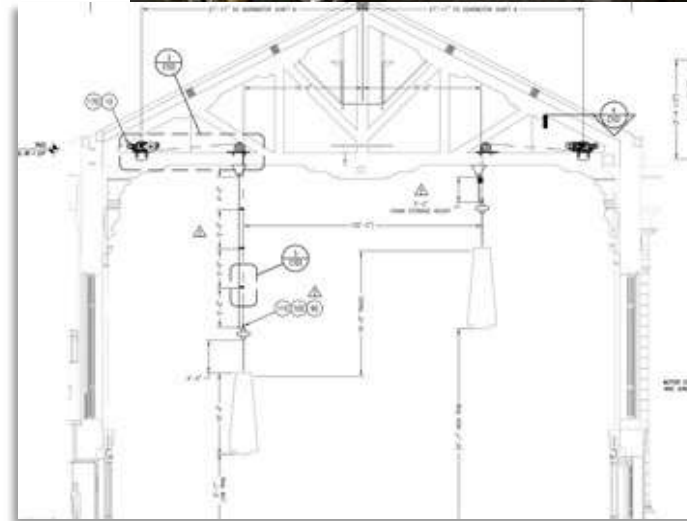
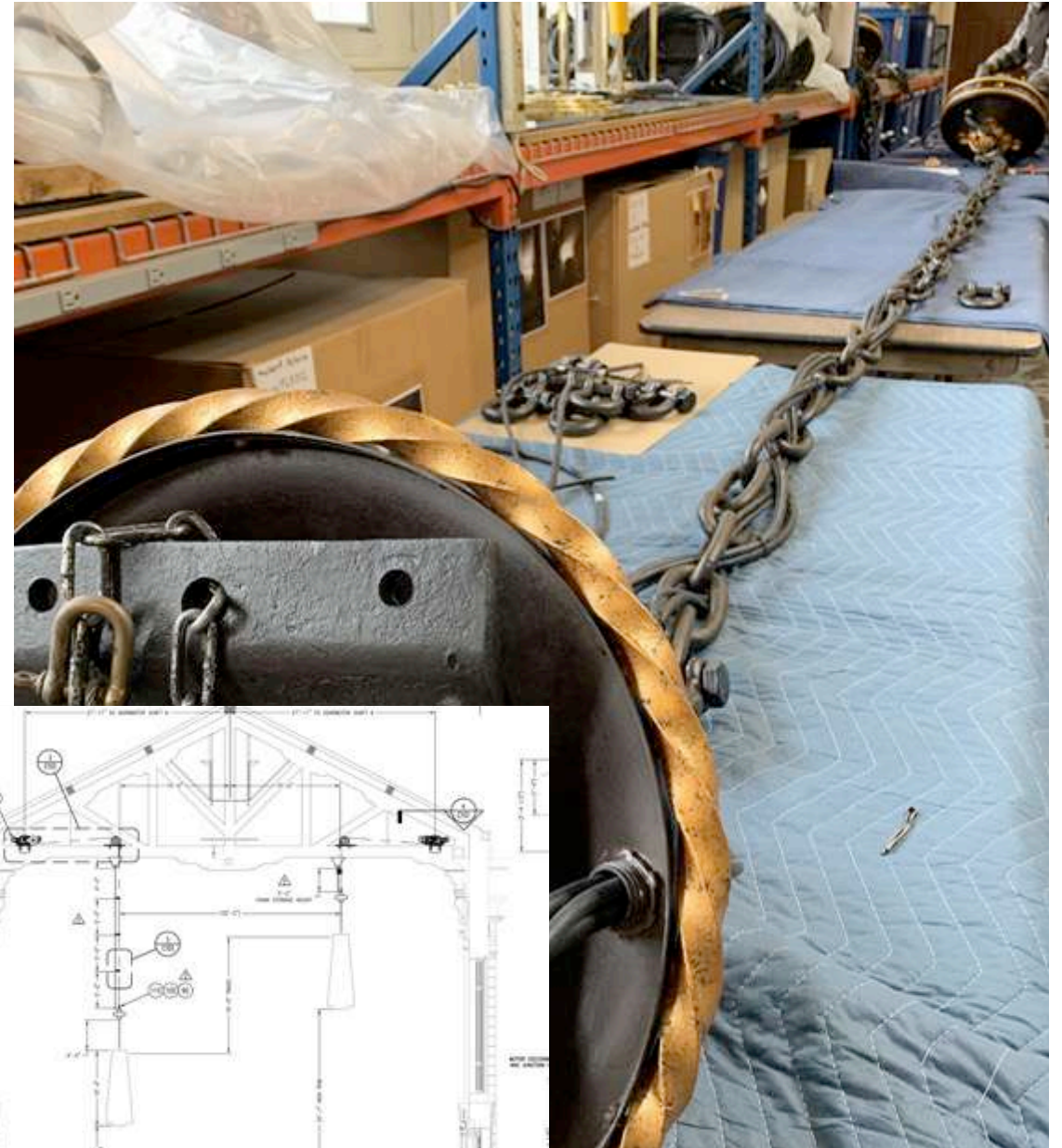
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- **Foot Candle Measurements & Light Levels**
- **Room/Location Aesthetics**



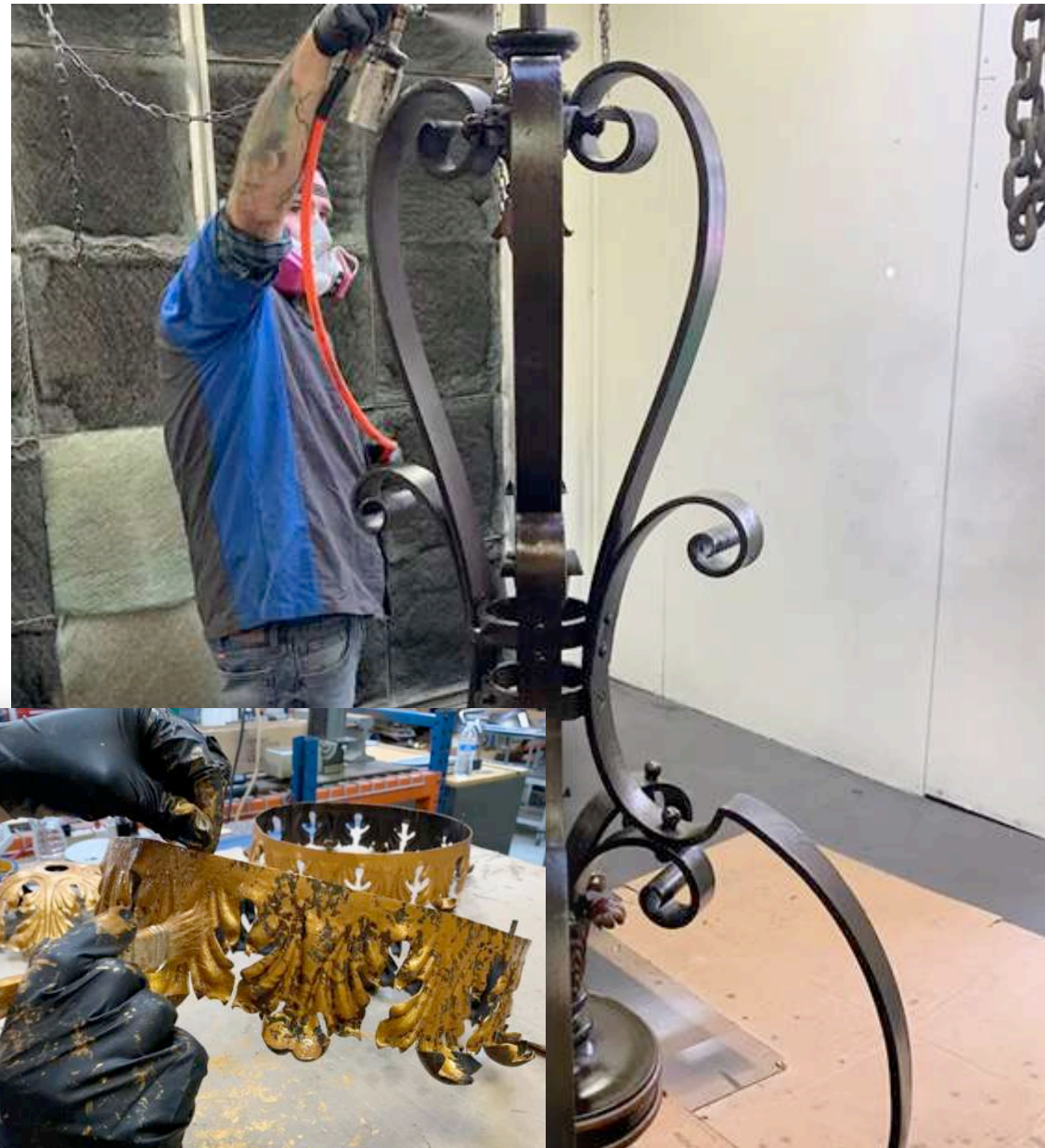
Specification Development

- Mechanical: Repair damaged components, fabricate replacement decorative components, & modification of upper pulley system



Specification Development

- Mechanical: Repair damaged components, fabricate replacement decorative components, & modification of upper pulley system
- **Finish: New two-tone metal oil & black antique gold finish to closely match the original**



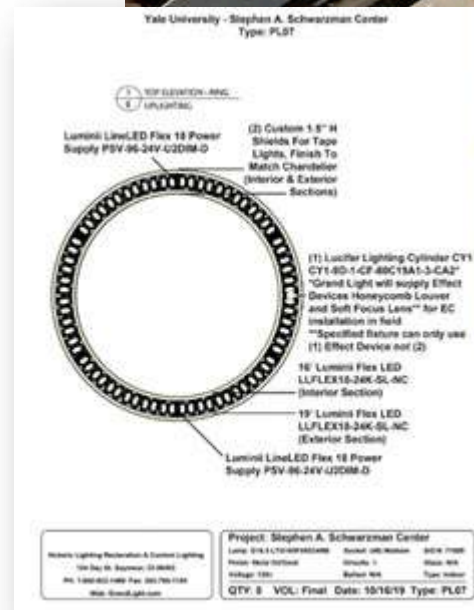
Specification Development

- Mechanical: Repair damaged components, fabricate replacement decorative components, & modification of upper pulley system
- Finish: New two-tone metal oil & black antique gold finish to match the original
- **Electrical: Combination of dedicated LED tape light, screw-in LEDs utilizing 49 existing E26 sockets and adding new LED Up-Light Modules capable of aiming laterally (North/South) between chandeliers**



Specification Development

- Mechanical: Repair damaged components, fabricate replacement decorative components, & modification of upper pulley system
- Finish: New two-tone metal oil & black antique gold finish to closely match the original
- Electrical: Combination of dedicated LED tape light, screw-in LEDs utilizing 49 existing E26 sockets and adding new LED Up-Light Modules capable of aiming laterally (North/South) between chandeliers
- **Reflectors: Added inside ring for new LED tape light**



Specification Development

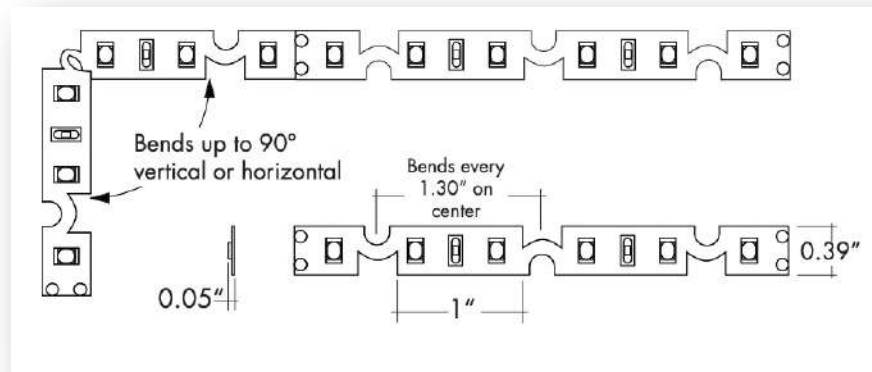
- Mechanical: Repair damaged components, fabricate replacement decorative components, & modification of upper pulley system
- Finish: New two-tone metal oil & black antique gold finish to closely match the original
- Electrical: Combination of dedicated LED kits & screw-in LEDs including new LED Up-Light Modules capable of aiming laterally (North/South) between chandeliers
- Reflectors: Added inside ring for new LED tape light
- **Mock-Ups: Test light output, distribution, and reflectance of new LED Tape Lights and Uplight Modules**



Luminaire Modernization

Design & fabricate a comprehensive LED system, utilizing a combination of dedicated LED retrofit kits and screw-in LEDs, for several large hand-forged iron chandeliers

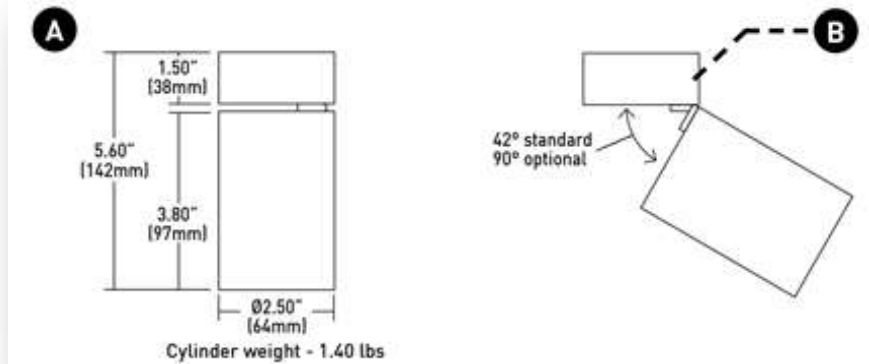
- 35ft High Intensity 92.75W LED Tape Lights w/ Dimmable LED Driver



Luminaire Modernization

Design & fabricate a comprehensive LED system, utilizing a combination of dedicated LED retrofit kits and screw-in LEDs, for several large hand-forged iron chandeliers

- Dedicated 17W LED Uplight Module
- Adjustable beam to highlight architectural elements



Luminaire Modernization

Design & fabricate a comprehensive LED system, utilizing a combination of dedicated LED retrofit kits and screw-in LEDs, for several large hand-forged iron chandeliers

- Replaced (49) 60W medium-base incandescent lamps
 - (49) G40 3.5W LED lamp



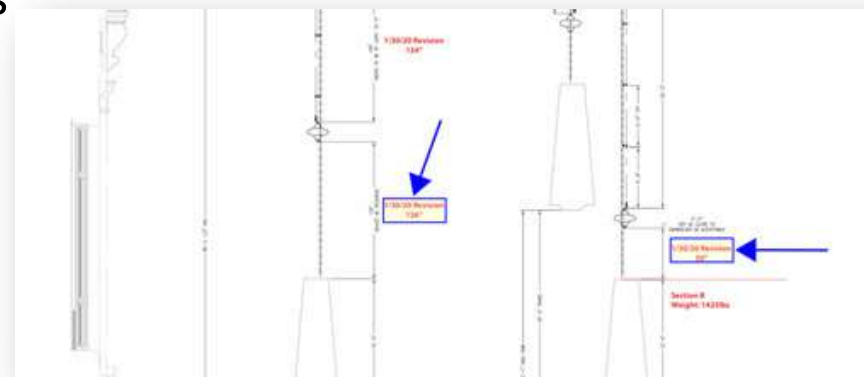
2,940 Watts > 281 Watts



Luminaire Modernization

New automated lifting system housed above the Commons.

- Renovated space upgraded with state-of-the-art audio-visual equipment for theatrical or music performances
- Raise & lower all chandeliers in sync with automated control panel as performances require
- Prevent damage, pinching, or severing electrical connections or wiring



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing



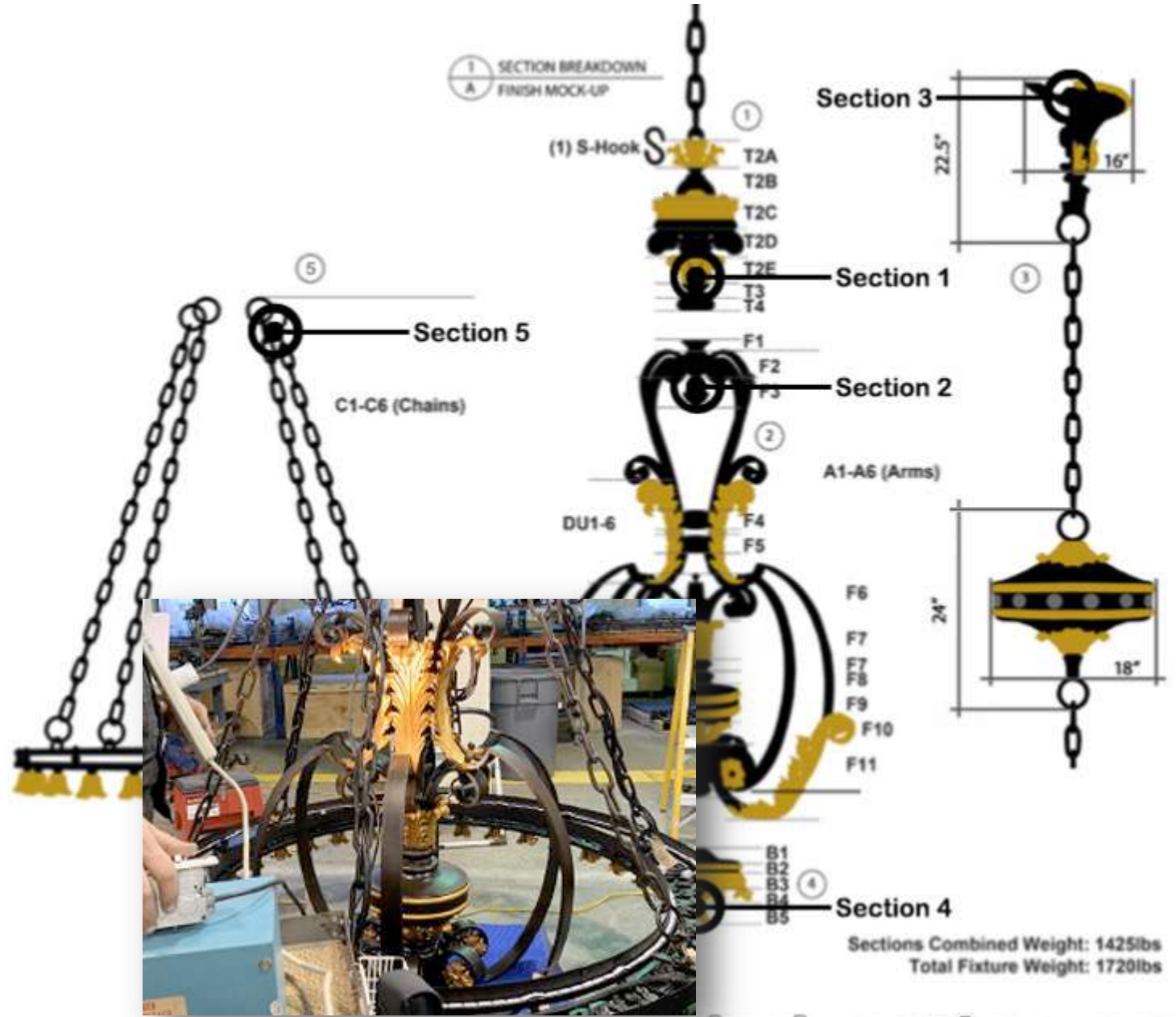
Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- **Transport**



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- Transport
- **Installation**
 - Testing
 - Instructions
 - Assembly



Sections Combined Weight: 1425lbs
Total Fixture Weight: 1720lbs









Yale University – Sterling Memorial Library

Objective: Bring the past to the present by improving lighting levels to accentuate the historic detailing of the space

Job Site: New Haven, CT

Year Completed: 2017

Architect: Apicella + Bunton Architects LLC

Electrical Contractor: All-Brite Electric, Inc.

Lighting Designer: Cline Bettridge Bernstein Lighting Design Inc.

General Contractor: Standard Builders



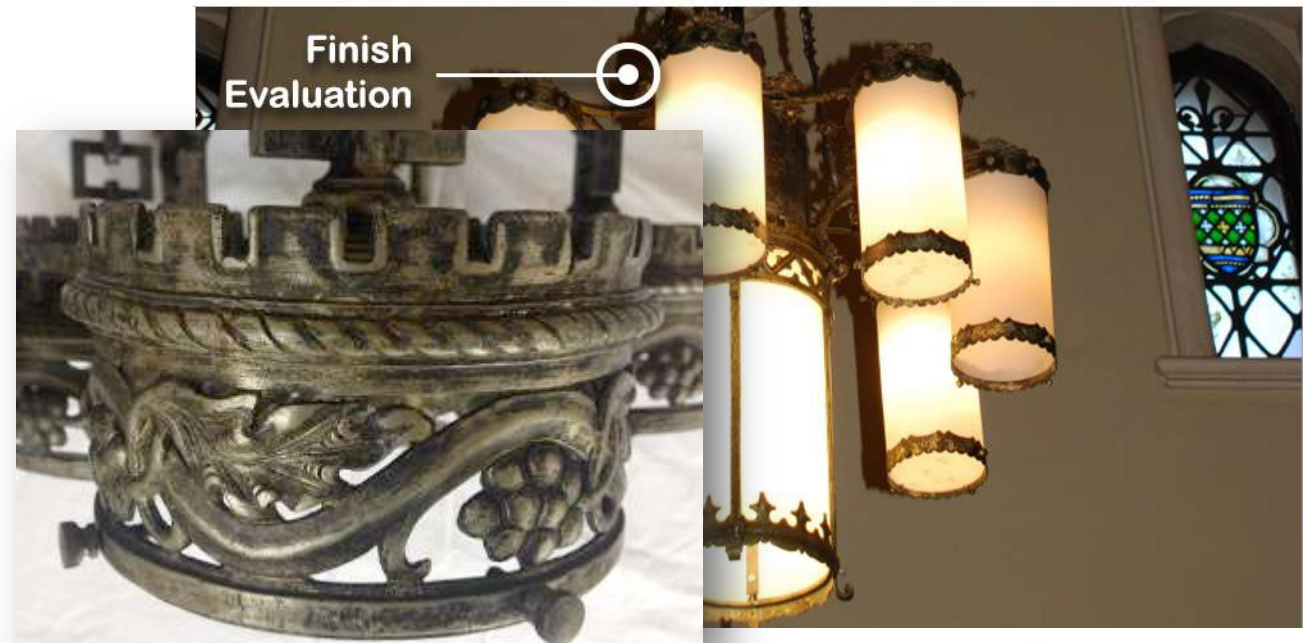
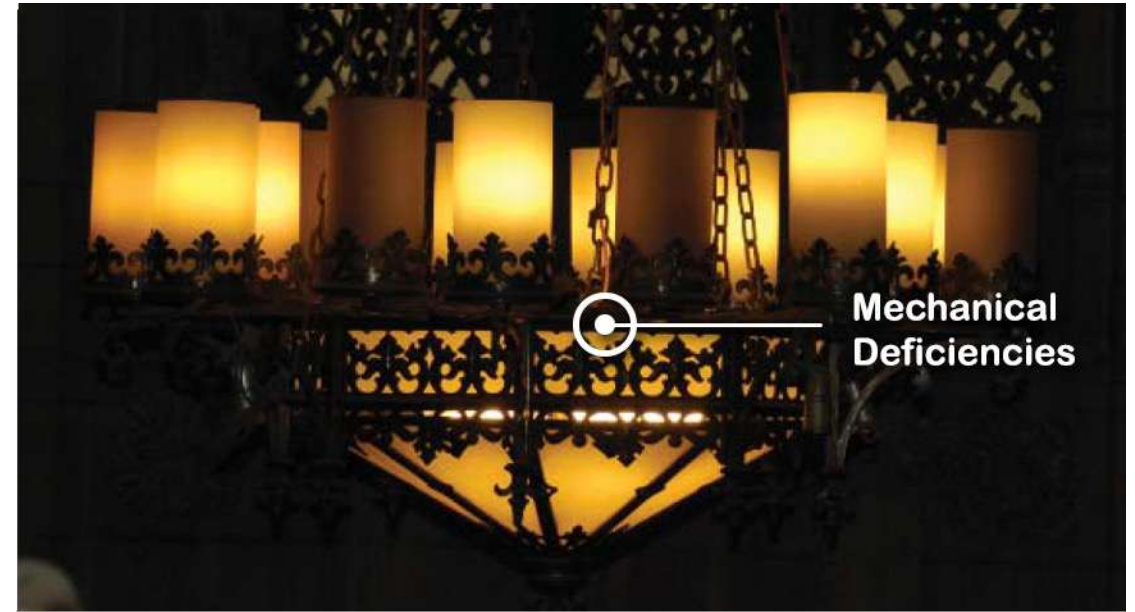
Luminaire Survey

- Mechanical: Identify deficiencies



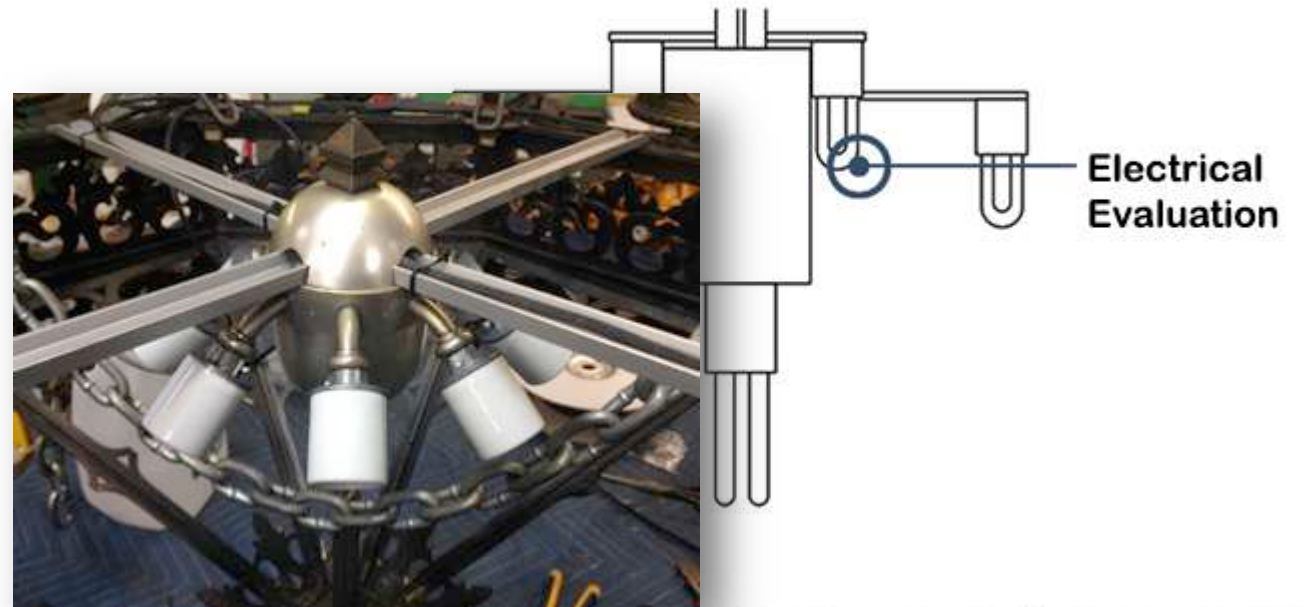
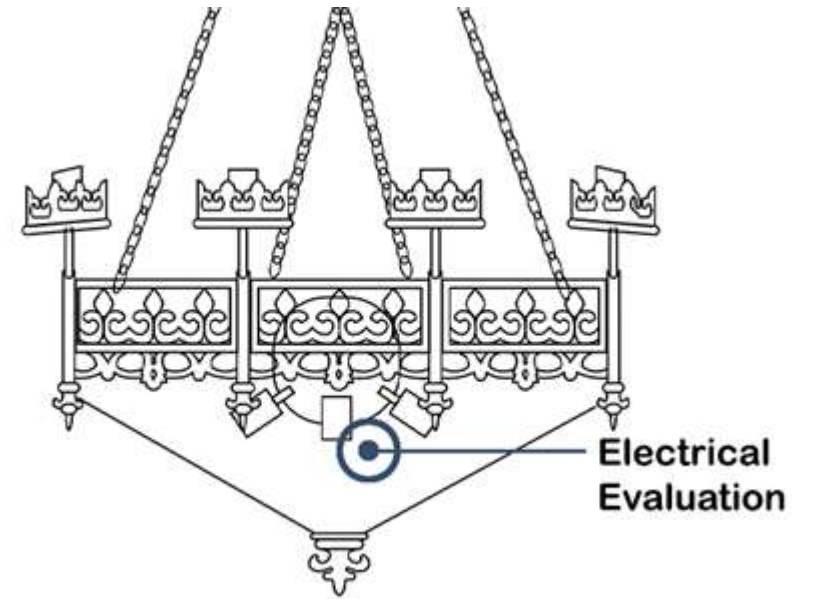
Luminaire Survey

- Mechanical: Identify deficiencies
- **Finish: Evaluate current condition via testing & sampling**



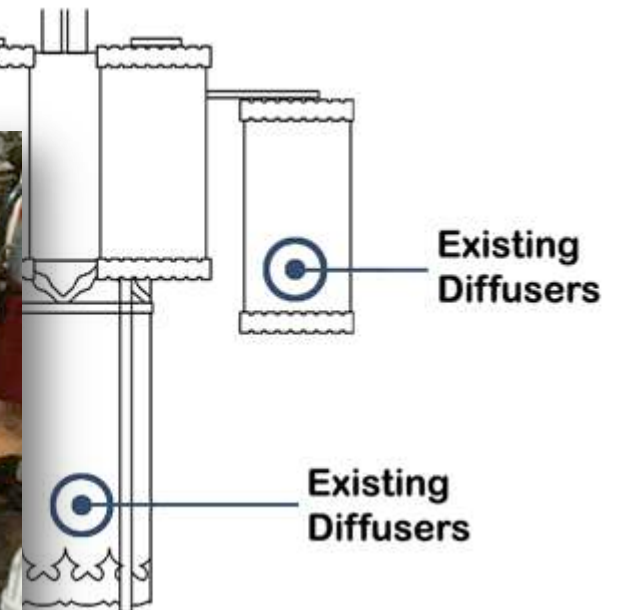
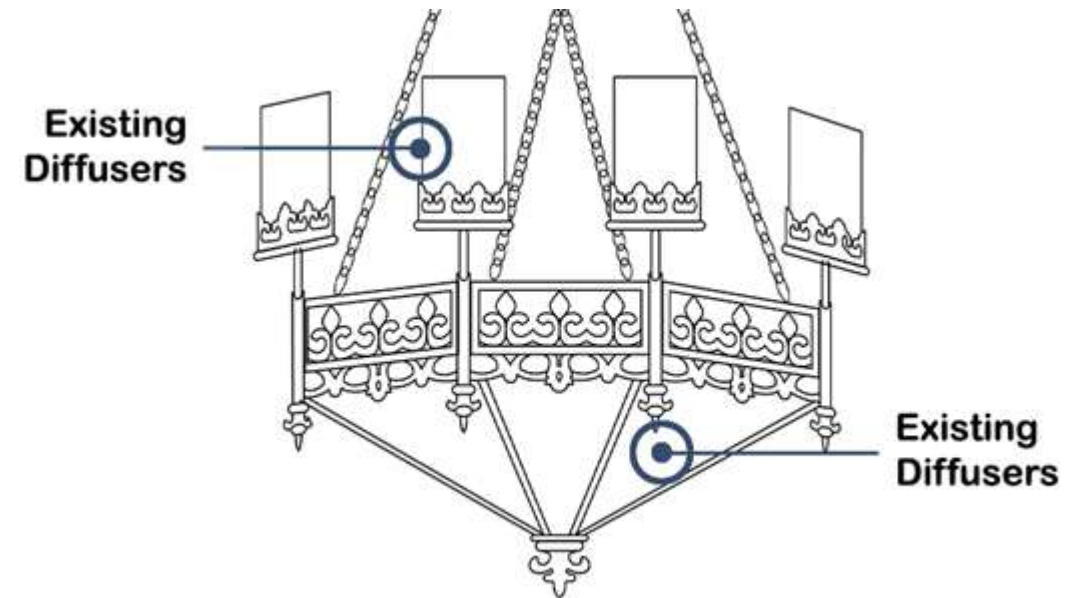
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- **Electrical: Electrical components & circuitry**



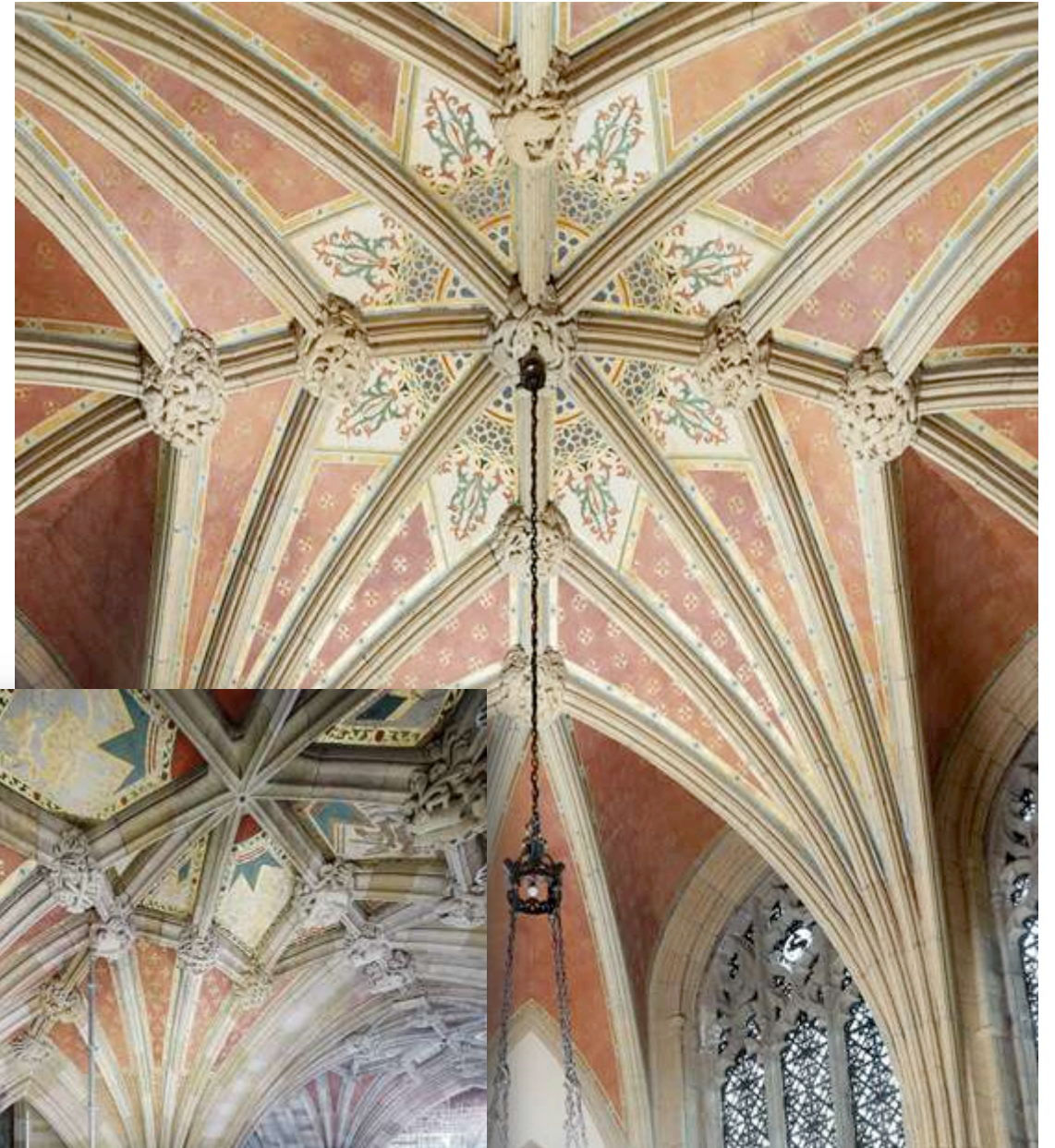
Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- **Diffusers: Evaluate lamp diffuser color, translucence, and type**



Luminaire Survey

- Mechanical: Identify deficiencies
- Finish: Evaluate current condition via testing & sampling
- Electrical: Electrical components & circuitry
- Diffusers: Evaluate lamp diffuser color, output, and type
- **Foot Candle Measurements & Light Levels**
- **Room/Location Aesthetics**



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- **Finish: Conserve and clean existing patina finish**



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- Finish: Conserve and clean existing patina finish
- **Electrical: Fixtures were previously modified to accommodate CFL Technology, additional components denigrated the historical integrity of the fixtures**



CFL Modified



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- Finish: Conserve and clean existing patina finish
- **Electrical: Fixtures were previously modified to accommodate CFL Technology, additional components denigrated the historical integrity of the fixtures**



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- Finish: Conserve and clean existing patina finish
- Electrical: Fixtures were previously modified to accommodate CFL Technology, additional components denigrated the historical integrity of the fixtures
- **Diffusers: Existing diffusers discolored and mix of white and frosted**



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- Finish: Conserve and clean existing patina finish
- Electrical: Fixtures were previously modified to accommodate CFL Technology, additional components denigrated the historical integrity of the fixtures
- Diffusers: Existing diffusers discolored and mix of white and frosted
- **Mock-Ups: Test light output, distribution, and diffusion of various lamping options and configurations**



Mock-Up



Mock-Up



Specification Development

- Mechanical: Repair of components with existing mechanical deficiencies and component modification to accommodate new glass
- Finish: Conserve and clean existing patina finish
- Electrical: Fixtures were previously modified to accommodate CFL Technology, additional components denigrated the historical integrity of the fixtures
- Diffusers: Existing diffusers discolored and mix of white and frosted
- **Mock-Ups: Test light output, distribution, and diffusion of various lamping options and configurations**



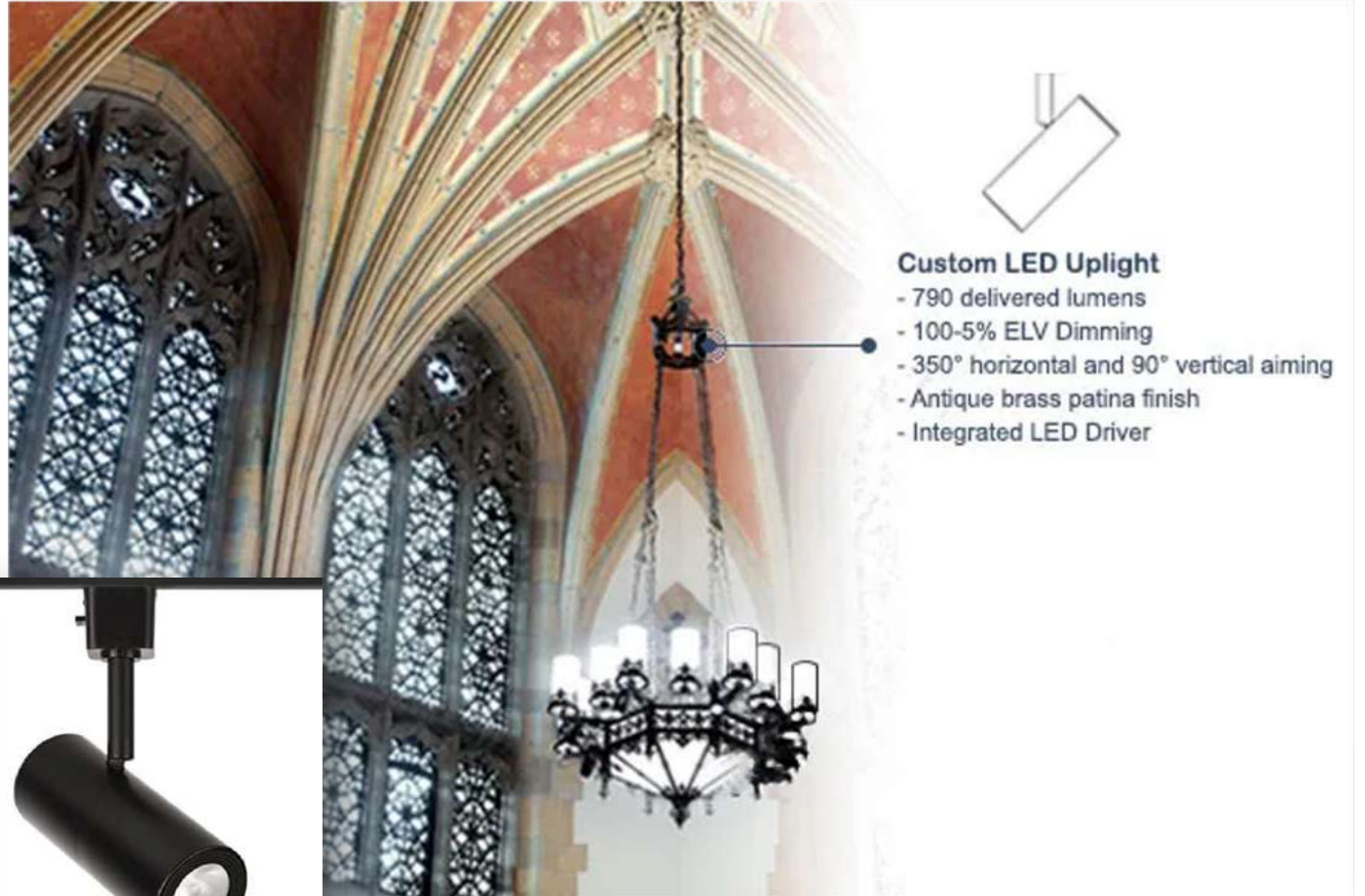
Approved Configuration



Luminaire Modernization

Design a comprehensive LED system, utilizing a combination of dedicated adjustable LED modules and screw-in LEDs, for several different types of chandeliers

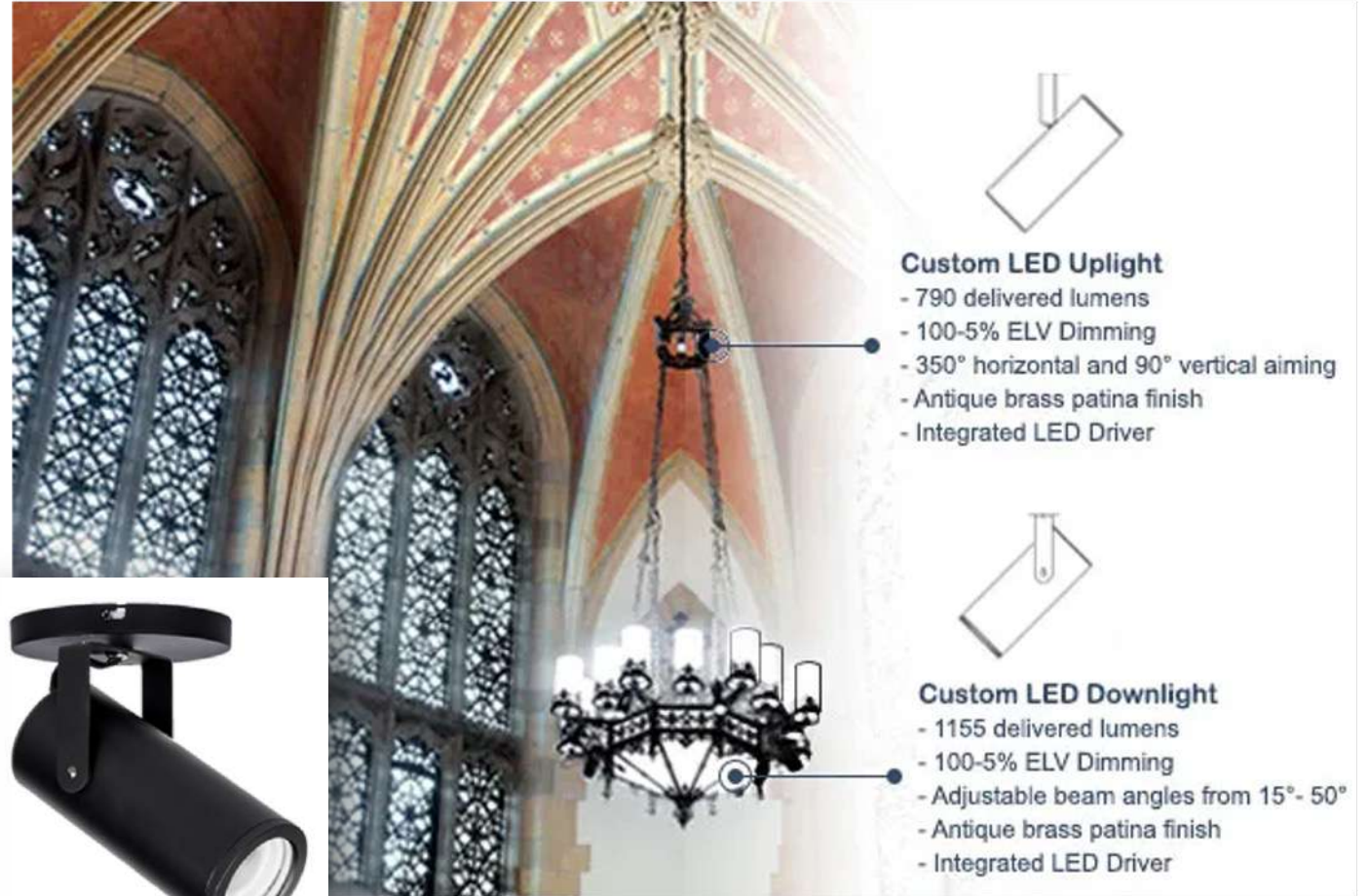
- (4) Adjustable, dimmable Up-Light LED 10W Modules in antique brass patina finish



Luminaire Modernization

Design a comprehensive LED system, utilizing a combination of dedicated adjustable LED modules and screw-in LEDs, for several different types of chandeliers

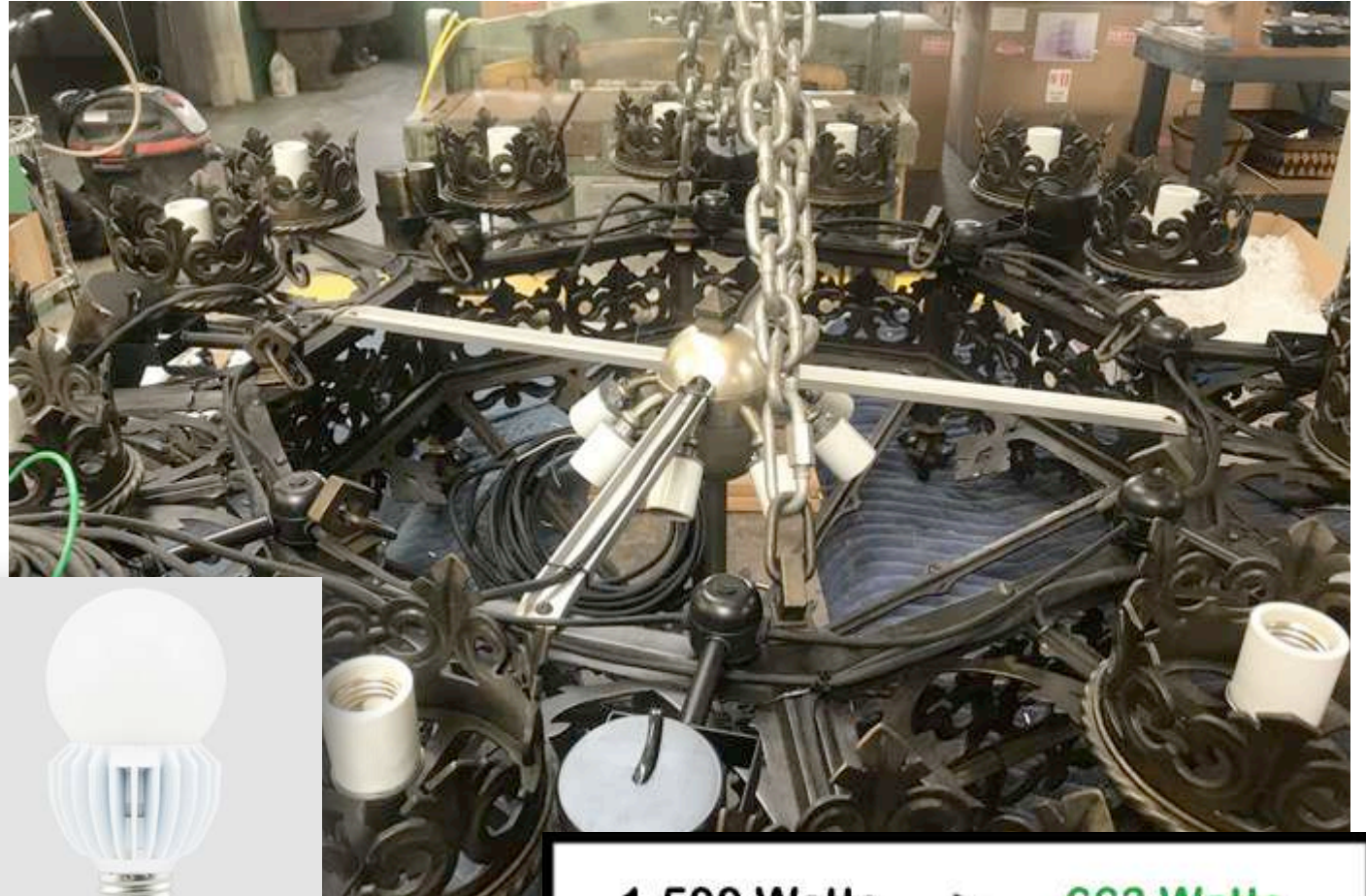
- (8) Adjustable, dimmable Downlight LED 20W Modules with snoot & cross louver accessory in antique brass patina finish



Luminaire Modernization

Design a comprehensive LED system, utilizing a combination of dedicated adjustable LED modules and screw-in LEDs, for several different types of chandeliers

- Replaced (25) 60W medium-base incandescent lamps
 - (25) Dimmable A19 18.5W LED lamp



1,500 Watts > 663 Watts



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- **Transport**



Logistics

- Removal
 - Disassembly
 - Documentation
 - Packing
- Transport
- Installation
 - Testing
 - Assembly
 - Instructions



 <p>Before You Begin: For easier repairs, before center glass cylinders, use water glass of extra heavy transparency to secure them.</p>	Center Cylinder - Step 1 <p>To begin, please inspect all glass for cracks or damage.</p> <p>(1) Large center cylinder will be installed first onto the large glass holder located at the bottom center of the frame. The center cylinder will be installed over and cover the 16 socket holder.</p>
Center Cylinder - Step 2 <p>Before the two screws that will be used for installation of the large center cylinder have been placed in the cylinder and will need to be secured and placed in installation. There are a total of 16 screws per center cylinder.</p>	Outer Cylinders - Step 1 <p>A large center cylinder holder will be used for installation of the large center cylinder. The center cylinder will be installed over and cover the 16 socket holder.</p>
Outer Cylinders - Step 2 <p>Using a screwdriver, all screws, inner and outer, should be secured to the center cylinder. The screws should be secured to the center cylinder and not to the frame.</p>	Outer Cylinders - Step 1 <p>Outer cylinders will be installed onto the large glass holder located at the bottom center of the frame. The center cylinder will be installed over and cover the 16 socket holder.</p>

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LEX-4 Glass Installation Instructions

 <p>Before You Begin: For easier repairs, before center glass cylinders, use water glass of extra heavy transparency to secure them.</p>	Center Cylinder - Step 1 <p>To begin, please inspect all glass for cracks or damage.</p> <p>(1) Large center cylinder will be installed first onto the large glass holder located at the bottom center of the frame. The center cylinder will be installed over and cover the 16 socket holder.</p>
Center Cylinder - Step 2 <p>Before the two screws that will be used for installation of the large center cylinder have been placed in the cylinder and will need to be secured and placed in installation. There are a total of 16 screws per center cylinder.</p>	Center Cylinder - Step 3 <p>Using a screwdriver, all screws, inner and outer, should be secured to the center cylinder. The screws should be secured to the center cylinder and not to the frame.</p>
Center Cylinder - Step 4 <p>Using a screwdriver, all screws, inner and outer, should be secured to the center cylinder. The screws should be secured to the center cylinder and not to the frame.</p>	Outer Cylinders - Step 1 <p>Outer cylinders will be installed onto the large glass holder located at the bottom center of the frame. The center cylinder will be installed over and cover the 16 socket holder.</p>
Outer Cylinders - Step 2 <p>Using a screwdriver, all screws, inner and outer, should be secured to the center cylinder. The screws should be secured to the center cylinder and not to the frame.</p>	Outer Cylinders - Step 1 <p>Outer cylinders will be installed onto the large glass holder located at the bottom center of the frame. The center cylinder will be installed over and cover the 16 socket holder.</p>

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LEX-3 Glass Installation Instructions











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