

The New York Times Building

Executive Summary

Excerpt for Shades and Shade Controls
December 31, 2004

The shades and shade controls scope of work is based upon the philosophy that occupants of commercial office buildings prefer natural light to electric light. The shade system goals for The New York Times Building are:

1. Maximize natural light
2. Maximize occupant connectivity with the outdoors, i.e. external views
3. Intercept sunlight penetration so as to avoid direct solar radiation on the occupants
4. Maintain a glare free environment
5. Provide occupant manual override capability
6. On any given façade the shades are as a general rule expected to be controlled together to the same bottom-of-hem height

The overall intent is to keep the shades up as much of the time as is possible without causing thermal or visual discomfort. Thermal comfort is assured by solar tracking and the geometry of the external sun screens. Visual comfort is assured by managing the luminance on the window wall. The manual override system has been specified based upon post occupancy evaluations of office building occupants with automated shade systems. The number one recorded complaint in these studies was the inability of an occupant to operate a shade or group of shades when necessary.

This performance specification has been made public in order to assist design professionals by providing an example of an automated shade system that has been market tested. This specification combined with reflected ceiling plans, furniture layouts, perimeter architectural typologies and details was competitively bid and led to the award of the shades and shade control system contract on September 30, 2004.

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SECTION 12494 - ROLLER SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes interior roller shades, motorized shade operators and an automatic shade controls system for the entire glazed perimeter of The New York Times Building for floors 2 through 28 including the garden court on floors 2, 3 and 4.
- B. See Division 16 Sections for electrical service and connections for motorized shade operation.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include: plans, elevations, section views, details of installation, operational clearances, wiring diagrams, and relationship to adjoining Work.
 - 1. Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 2. Submit shop drawings in electronic format, MicroStation version J.
- C. Coordination Drawings: Drawn to scale and coordinating penetrations and ceiling-mounted items.
- D. Samples: For each exposed finish and for each color and texture required.
- E. Window Treatment Schedule: Use same room designations indicated on Drawings.
- F. Maintenance data.
- G. Shop drawings shall be delivered in accordance with a schedule established in consultation between Owner and Shade Controls System Supplier.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer, approved by Shade Controls System Supplier to install shade products.
- B. Roller Shades Fire-Test-Response Characteristics: Provide products passing flame-resistance testing according to NFPA 701 by a testing agency acceptable to authorities having jurisdiction.

- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the 2002 National Electric Code with New York City amendments, and NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Corded Window Covering Product Standard: Comply with WCMA A 100.1.

PART 2 - PRODUCTS

2.1 ROLLER SHADES

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Lutron Electronics Co., Inc.
 - 2. MechoShade Systems, Inc.
 - 3. Nysan Shading Systems
- B. Fabric manufacturers: Subject to compliance with requirements, provide products from one of the following:
 - 1. MechoShade Systems, Inc.
 - 2. VIMCO
 - 3. Hexcel
 - 4. Mermet
- C. Finishes:
 - 1. Metal and Plastic Components Exposed to View: Color shall be RAL 9003.
- D. Shade fabric: PVC-coated fiberglass, PVC-coated polyethylene or non-PVC coated “yarn”
 - 1. Material width shall suit window widths, typically five feet wide bands.
 - 2. Material optical transmittance properties shall be consistent with the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) luminance criteria.
 - 3. For each shade control zone the Supplier shall determine the proper density and weave of the fabric to meet the luminance requirements. Shade fabrics may thus vary from façade to façade and for different elevations (floors) of the building. Owner reserves the right to change the fabric OF and color at no cost prior to installation.
 - 4. Material Safety Data Sheets shall be provided.
 - 5. Shades shall be washable with soap and water.
 - 6. The twill and fill colors and geometry shall be approved by the Architect.
 - 7. Shade fabric may be made of different face colors.
 - 8. Black out shades shall be opaque. Architect shall approve color(s) and geometry.
- E. Rollers: Electrogalvanized or epoxy primed steel or extruded-aluminum tube of diameter and wall thickness required to support and fit internal components of operating system and the

weight and width of shade band material without sagging; designed to be easily removable from support brackets.

1. Shade Material Attachment: Shade Controls System Supplier's standard method for attaching shade material to roller.
 2. Direction of Roll: Regular, from back of roller.
- F. Mounting Brackets: Galvanized or zinc-plated steel.
- G. Pocket-Style Head Box: U-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; with bottom open.
1. Corner Section: Factory formed and welded.
- H. Bottom Bar: Steel or extruded aluminum with plastic or metal capped ends and with concealed weight bar as required for smooth, properly balanced shade operation.
1. Type: Concealed, by pocket of shade material, internal.
- I. Shade Operation: Motorized operator AC or DC with capability of operating up to six (6) each coupled five ft. wide shades.
- J. Mounting: Recessed in ceiling pocket, permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes. At corner conditions the mounting system shall allow a minimal light gap not to exceed ¼" while ensuring that the perpendicular shade bands do not touch.

2.2 FABRICATION

- A. Product Description: Roller shade consisting of roller, a means of supporting roller, flexible sheet or band of material carried by roller, a means of attaching material to roller, bottom bar, and operating mechanism that lifts and lowers the shade.
- B. Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
1. Lifting mechanism with permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
1. Shade Units Installed Outside Jambs: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
 2. The gap between five ft. wide shade bands in a motor group, i.e. coupled together, shall not exceed one inch.
 3. The gap between shade motor groups shall not exceed one inch.

- D. Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting head box, roller, and operating hardware and for hardware position and shade mounting method indicated.
- E. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal non-corrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.

2.3 MOTORIZED ROLLER SHADE OPERATORS

A. General:

- 1. Factory-assembled motorized shade operation systems designed for lifting shades of type, size, weight, construction, use, and operation frequency indicated and of size and capacity and with features, characteristics, and accessories suitable for Project conditions and recommended by shade manufacturer.
- 2. Include electric motors and factory pre-wired motor controls, remote-control stations, remote-control devices, power disconnect switches, enclosures protecting controls and all operating parts, and accessories required for reliable operation without malfunction.
- 3. Wiring shall be provided by the Electrical Installation Contractor
 - a. Power and controls to the motors
 - b. Power and controls to the sensors
 - c. Power and controls to the manual override touch screens
 - d. System interconnections
- 4. Coordinate wiring requirements and electrical characteristics with the building electrical system.
- 5. Provide supervision during the wiring installation to ensure the wiring is being performed in accordance with the shop drawing details.
- 6. Comply with NFPA 70.

B. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6 with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc. Control boxes shall be located in central core closets on the floors to the extent possible. Control boxes in the ceilings are to be minimized. The as-built location of any ceiling mounted control boxes shall be clearly defined on the record drawings, specifically on reflected ceiling plans.

C. Electric Motors: UL-approved or -recognized, asynchronous, totally enclosed, insulated, capacitor-start motors, complying with NEMA MG 1, with thermal-overload protection, brake, permanently lubricated bearings, and limit switches; sized by shade manufacturer to start and operate size and weight of shade considering service factor or considering Project's service conditions without exceeding nameplate ratings.

- 1. Service Factor: According to NEMA MG 1, unless otherwise indicated.
- 2. Motor Characteristics: AC Single phase, coordinate voltage rating with Engineering Drawings, 60 Hz; or, DC.
- 3. Motor Mounting: Within manufacturer's standard roller enclosure.
- 4. Motor warranty shall be 5 years from the date of Final Acceptance.

2.4 SHADE CONTROL SYSTEM

- A. Primary goals of the shade control system are:
1. Maximize natural light
 2. Maximize occupant connectivity with the outdoors, i.e. external views
 3. Intercept sunlight penetration so as to avoid direct solar radiation on the occupants
 4. Maintain a glare free environment
 5. Provide occupant manual override capability
 6. On any given façade the shades are as a general rule expected to be controlled together to the same bottom-of-hem height.
- B. Sensors
1. Interior sensors shall primarily be located in the lighting fixtures within a 6" removable center plate centered in the 5 ft. ceiling mounted lighting fixtures. A secondary interior sensor location shall be flush mounted on the perimeter side of the dry wall clad columns.
 2. Any other interior locations must be coordinated with the Architect. Architect reserves the right to refuse positions that are aesthetically displeasing.
 3. Exterior sensors may be located on the mast platform or on the roof ceramic rods screen steel support structure. Exterior sensors installed on the roof ceramic rods screen steel support structure but must be coordinated with window washing tracks and equipment.
 4. Exterior sensors may not be located on the ceramic rods, ceramic rods supports or windows on any floors.
 5. Radiometers may be installed on the mast platform located approximately 130 above the base of the mast.
 6. Analog to digital converters and amplifiers may be located in the NYT radio room on the 51st floor.
 7. Sensors shall determine sky conditions, boundary conditions for each shade control zone and average luminance in the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods).
 8. The types, locations (within the constraints identified herein) and number of sensors shall be determined by the Shade Controls System Supplier.
 9. Architect shall approve sensor appearance.
 10. Exterior sensor signals shall be available to Owner and Owner's contractor as an input to the podium skylight control system.
- C. Shade alignment
1. All shade heights within a shade control zone shall be bottom-of-hem matched within ½ inch.
 2. All shade heights within a shade motor group shall be bottom-of-hem matched within ¼ inch.
 3. The accuracy of shade alignment shall be maintained over a period of five years from the date of Final Acceptance.
- D. Control algorithms and the automatic control system mode
1. The shades shall block direct sun so that the depth of direct sun penetration is no greater than a specified horizontal depth from the face of the window wall at floor level. The specified maximum penetration distance may vary for different perimeter areas and on different floors. The shades shall not be deployed to block direct sun if the sun is blocked

by nearby buildings within an entire shade control zone. The exterior ceramic rods provide direct sun shading. Automated shade control shall account for this shading. The profile angle and solar surface azimuth angle shall be determined by the Shade Controls System Supplier based upon the geometries of the curtain wall.

2. The shades shall control glare so that the window luminance viewed from any angle within the work space is no greater than a specified level during the day. This includes all periods throughout the day when there is or is not direct sun in the plane of the window. When there is no direct sun in the plane of the window wall, the average luminance of the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) shall not exceed 2000 cd/m² (candelas per square meter). When there is direct sun in the plane of the window but the orb of the sun is not within the immediate field of view, the average luminance of the unobstructed portion of the window wall shall not exceed 2000 cd/m². When there is direct sun in the plane of the window and the orb of the sun is within the immediate field of view, the average luminance of any portion of the window wall shall not exceed 2000 cd/m² for more than 30 minutes.
3. Daylight admittance shall be maximized by raising the shades when sun control and glare control are not required.
4. View to the outdoors shall be maximized by opening the shades so that the shades do not block the unobstructed vision portion of the window wall when sun control and glare control are not required.
5. Variable sky conditions in a given day shall cause shade operations as the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) luminance varies.
6. Response to variable luminance at the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) shall be limited so as to avoid shade movement hysteresis. As the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) luminance increases, shade movements shall respond at normal system response speed. As the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) luminance decreases shade movements shall respond after a predetermined delay of five minutes minimum. If shades are in a position in which sunlight penetration would exceed the specified distance for that area, but cloudy conditions are present and the system is allowing view and increased natural light levels to occur, then as the cloudy condition changes to a sunny condition immediate shade movement shall occur to intercept the sunlight.
7. Response to variable sky conditions shall be immediate as the conditions change from cloudy to sunny, that is the shades shall go to the appropriate preset position immediately without stopping at intermediate preset positions. Response shall be staged one preset at a time with a delay of five minutes minimum between successive shade movements when sunny conditions change to cloudy.
8. Multiple shade control zones may be controlled by a sensor or group of sensors. Boundary conditions for shade control zones shall be factored into the system.
9. Shade positions shall be limited to a predetermined set of presets. On all facades with ceramic tubes these presets are: fully retracted, half way between the fully retracted position and the top of the vision window, top of the vision window, 4 feet above finished floor, bottom of vision window and down to the floor.
10. The presets for façade typologies without ceramic tubes shall be numerically the same and shall match the heights described in subparagraph 2.4.D.9 of this section of the

specifications except where the façade is a louver in which case no shades shall be provided.

11. In automatic mode the shades shall move to the 6 preset positions at the specified vertical heights. The system shall enable additional preset heights to be inserted or existing preset heights to be revised by the System Operator or System Administrator.
12. Sunset and sunrise conditions shall be programmed as separate controlled events. For the fifteen minutes after sunrise, the shades on all facades shall be fully open. For the fifteen minutes before sunset the shades on all facades shall be fully open.
13. The different building elevations and façade orientations will experience different urban conditions such as shading by other buildings and reflections off of other buildings depending upon the time of year and time of day. The shade control zones and sensor locations shall enable the shade control system to carry out the primary goals as identified in paragraph 2.4.A of this section of the specifications.
14. Seasonal modes of operation that address the highest luminance sunpath conditions on the various facades shall be programmed.
15. At night the shades shall be fully retracted.
16. System universal commands shall enable the System Operator and all security levels above System Operator to perform the following activities from the shade system main console/PC:
 - a. Lower all shades to floor height with a single command
 - b. Raise all shades to open position with a single command
 - c. Lower all shades on a specific floor to floor height with a single command
 - d. Raise all shades on a specific floor to fully retracted position with a single command
17. The shade control motors shall move the shades within a shade control zone with delays on the order of milliseconds so that the shades in the zone appear to move to a new preset together.
18. The shades on the southern façade have multiple conditions to manage and as such these shade control zones may not match heights throughout an entire day. The southern central zone with ceramic tube screen may not match the shades on the notches where there are no ceramic tube screens or by the convenience stairs.
19. The shades for the cafeteria seating area on floor 14 shall operate in a double height space. There shall be two shades vertically aligned to cover the double height perimeter curtain wall condition. The top and bottom shades in each of these vertically aligned pairs shall operate as one continuous shade with a minimal horizontal light gap between top and bottom shade not to exceed ½”.
20. The shades for the library on the 28th floor shall operate in a double height space. There shall be two shades vertically aligned to cover the double height perimeter curtain wall condition. The top and bottom shades in each of these vertically aligned pairs shall operate as one continuous shade with a minimal horizontal light gap between top and bottom shade not to exceed ½”.

E. Manual control system mode

1. Occupant override shall be provided via a touch screen panel mounted on each perimeter column in the space. The touch screen shall be enabled by the touch of a finger and a map of the shades by shade motor for the local area on that floor shall be brought up onto the screen. Each shade motor when touched shall provide a drop down menu showing

the presets. When a preset is selected that shade motor shall move that shade to the manually selected preset position.

2. Manual occupant override shall maintain the shade position at the selected preset until: (i) the next system command to further lower the shades in that control zone at which time the shade will rejoin the shade control zone at the lower height determined by the automatic control system for that shade control zone, or (ii) if the shade was lowered by the manual override activity, then the system will check the window luminance after the override was accomplished and it will remain in that position until the system can assure the same window luminance with the shade raised. Irregardless the shades shall go back to automatic control no later than 15 minutes prior to sunset.
3. Manual override in the area beside the southern convenience stair cases shall have special features.
4. Each manual override in the open plan and in the perimeter offices shall be reported as an alarm. Other manual overrides such as in conference rooms shall not be reported as alarms. All manual override activities shall be trended.

F. Maintenance mode

1. When in maintenance mode the shades selected shall no longer be under the control of the automatic controls or occupant override. This shall remain so until maintenance mode is deselected at which time the automatic control system shall regain control.
2. The entire system may be placed in maintenance mode from a single command at the main shade control system console/PC. This command places every shade in maintenance mode.
3. Each floor may be selected and placed in maintenance mode. This command places every shade on that floor in maintenance mode.
4. Each shade control zone may be selected and placed in maintenance mode. This command places every shade in that shade control zone in maintenance mode.
5. Each shade motor group may be selected and placed in maintenance mode.
6. A web browser for the System Operator shall be provided on a wireless network or on a network provided by Owner.

G. Program mode

1. When in program mode the predetermined adjustable parameters in the system may be revised by the System Administrator.
2. Parameters that shall be adjustable are:
 - a. delay time for system response to a change from sunny to cloudy condition
 - b. delay time for system response to a reduction in average luminance in the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods)
 - c. sun light penetration distance by shade control zone
 - d. maximum average luminance of the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) by shade control zone

H. Shade control system database

1. An archived log file shall be maintained in the system drive(s).
2. The log file shall provide deterministic values including, but not limited to: position of shades, glare photo sensor data, profile angles, radiometer readings and system control mode (auto, manual and maintenance).

3. The system shall monitor and store all requisite change-of-value data needed to troubleshoot control operations including: date, time of day, solar condition, profile angle, shade motor group ID, shade control group ID, zone azimuth, sensor output values, shade height, control trigger (direct sun light penetration, glare, local manual override, system override), modified output values for the luminance of the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods), time delay setpoints and time delay values.
 4. Data shall be stored on a daily basis.
 5. Data shall be exportable to a MicroSoft Excel or Access database format.
 6. Data shall be automatically archived.
 7. System reports shall be available to the System Operator and all security levels above System Operator. The system shall trend real-time and historical data. Reports shall include, but are not limited to: trend reports on the variables described in paragraph 2.4.H.3 of this section of the specifications. For example the manual override by shade motor group shall be trended so that a consistent override activity in a specific shade control zone is highlighted to the System Operator.
- I. Interface compatibility with Building Management System (BMS)
1. The shade control system shall be capable of receiving and acting in accordance with universal commands from the BMS. The universal commands shall include, but are not limited to: lower all shades to floor height; raise shades to fully retracted position and, return to automatic control mode.
 2. The protocol for these messages may be BacNet or LON Works.
- J. Graphical User Interface (GUI) shall be customized to this project through easy to use applications and shall include:
1. The main shade control console/PC shall provide a map of each floor showing the shade motor groups, shade control zones and sensor locations with the real-time position of each shade motor group.
 2. The main shade control console/PC shall provide a chart of all adjustable parameters with their current values.
 3. All reports shall be viewed on the main shade control console/PC.
- K. System architecture shall include, but not be limited to:
1. Windows based head end system with main shade control system console/PC located in the System Operator's office.
 2. Vertical distribution cables shall be Ethernet or category 6E throughout the building.
 3. Shade motor group control unit(s) may be centrally located in the Shade Controls Closet or distributed in the ceiling. All ceiling mounted controls components shall be located so as to be accessible for maintenance activities. Above the ceiling is a return air plenum on all floors. On each floor where a centrally located system is proposed, a sketch of the wall space required to mount the control unit(s) shall be submitted with the proposal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install roller shades level, plumb, square, and true according to manufacturer's written instructions. Allow clearances for window operation hardware.
 - 1. Shade band shall be positioned not further than 1 inch from the inside of the interior curtain wall mullion on all façade typologies and the garden court.
- B. Adjusting: Adjust roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- C. Cleaning: Clean roller shade surfaces after installation, according to manufacturer's written instructions.

3.2 DEMONSTRATION

- A. Shade Controls System Supplier shall train Owner's maintenance personnel to adjust, operate and maintain systems. A minimum 40 hours of one-on-one training shall be provided to the System Operator and a separate 40 hours training shall be provided one-on-one to the System Administrator. Refer to Division 1 Section "Closeout Procedures Demonstration and Training."
- B. All building occupants on floors 2 through 28 inclusive shall receive a paper-based educational guide on the general workings of the shade control system and specific instructions on how to use the manual override feature. An electronic version of the same guide shall be stored in the database and also displayed on the manual override touch screen panels.

3.3 COMMISSIONING

- A. The shade control system will be commissioned on a floor by floor basis and then finally as an entire system. Final commissioning shall be successfully completed prior to the first move-in date for The New York Times occupants.
- B. Final Acceptance of the shade control system shall be contingent upon successful commissioning of each floor and the entire system.
- C. During commissioning the following will be measured to determine system performance:
 - 1. Average luminance of the unobstructed portion of the window wall (the glazing area not shielded by the exterior ceramic rods) shall not exceed 2000 cd/m².
 - 2. Sunlight penetration distance shall not exceed the Owner specified distance for each shade control zone.

3. Response to variable external conditions including, but not limited to: partially sunny days; shading from other buildings in the neighboring urban landscape; and, reflections from other buildings in the neighboring urban landscape
4. Matching heights of adjacent shades
 - a. within each shade motor group
 - b. within each shade control zone
5. Proper consistent action of all shade groups on each façade for a 30 day period
6. The shade log shall be plotted for each shade motor group for the 30 day period. The log shall be used to demonstrate to the Owner that the automated shade movement meets the specified criteria in these specifications.
7. Return from manual override to automatic mode shall be demonstrated to be in accordance with these specifications using the log and also through direct observation under partly cloudy conditions.
8. All aspects of rezoning, control monitoring, logging, fault diagnostics and reporting shall be demonstrated to the Owner.
9. Vertical light gaps between shades at corner conditions and horizontal light gaps in the cafeteria seating area shall not exceed specified $\frac{1}{4}$ ".

D. Final Acceptance shall be upon successful demonstration of all commissioning requirements described in section 3.3.C of these specifications.

3.4 WARRANTY

- A. The shade fabric shall have a lifetime warranty.
- B. The motors and control system components shall have a 5 year labor and material warranty.

3.5 SPARE PARTS

- A. Ten each shade bands, five feet wide, shall be provided.
- B. Ten shade band couplers shall be provided.
- C. Ten motors shall be provided.
- D. One shade control mother board shall be provided.

3.6 PRE-COMMISSIONING ACTIVITIES AT THE COLLEGE POINT MOCK UP

- A. Product testing to finalize shade fabric criteria, openness factor and optical transmittance properties
- B. Luminance measurements at various sun angles on each façade typology
- C. Predefined potential problem times shall be investigated

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- D. Sensor locations
- E. The size of various shade control zones and the possibility of multiple shade control zones on one sensor shall be investigated.

PART 4 - ALTERNATES

- 4.1** A web browser based manual override system in lieu of the touch screen panels mounted on columns throughout the space. The web browser alternate shall provide a system for occupants to select a shade or group of shades and then manually override the automatic mode and set the shade(s) at a preset to their liking on their desktop PC. The program application must be easily downloaded onto both McIntosh and Windows based desktop computers. A user profile database will be required to be established. Based upon the user's location limits shall be placed upon which shades or shade groups may be selected for manual override. These limits include, but are not limited to: only shades on the user's floor may be selected for override; and, only shades within neighboring shade control zones of the user's location may be selected. The system must include logical constraints to prevent abuse, i.e. an inordinate number of shade overrides by a single user in a brief period of time; and, to prevent hysteresis by conflicting commands from two or more users within the same shade control zone. Messages to users shall be provided by the system explaining why a shade cannot be selected or conflicting commands that cannot be carried out.
- 4.2** Shade fabric alternates may be offered that include non-PVC coated "yarn" and/or sustainable fully recyclable materials. All optical properties must be provided with the bid proposal.
- 4.3** Provide a full deduct for removal of the shade installation from the proposal.
- 4.4** Provide a full deduct for furnish and install of the shades on all 4 sides of the garden court on floors 2, 3 and 4.
- 4.5** Provide an add alternate for furnishing black out shades in the private dining rooms on the 15th floor.
- 4.6** Provide an add alternate to furnish and install black out shades in tracks provided by the curtain wall contractor on the glass wall at the back of the auditorium stage.

END OF SECTION 12494