# MASTER SPECIFICATIONS: DIVISION 12 – FURNISHINGS

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Horizontal louver blinds with aluminum slats.
2. Motorized operators.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For horizontal louver blinds, include fabrication and installation details.

1. Motorized Operators: Include details of installation in headrails and include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, 12 inches (300 mm) long.

D. Samples for Initial Selection: For each type and color of horizontal louver blind.

1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type and color of horizontal louver blind indicated.

1. Slat: Not less than 12 inches (300 mm) long.
2. Tapes: Full width, not less than 6 inches (150 mm) long.
3. Valance: Full-size unit, not less than 12 inches (300 mm) wide.

F. Product Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.
1.4 INFORMATIONAL SUBMITTALS
A. Product Test Reports: For horizontal louver blinds with polymer slats that have been tested for compliance with NFPA 701, for tests performed by manufacturer and witnessed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS
A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Horizontal Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE
A. Comply with the most current edition of the Northwestern University Design Standards.

1.8 DELIVERY, STORAGE, AND HANDLING
A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS
A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

   B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.
2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

A. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
   1. Bali
   3. Levolor Contract; a Newell Rubbermaid company.
   4. Draper Inc.

B. **Slats:** Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
   1. Width: 1 inch (25 mm).
   2. Thickness: Not less than 0.008 inch (0.20 mm).
   3. Spacing: 0.71 inch.

C. **Headrail:** Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
   1. Capacity: [One] [Two] blind(s) per headrail unless otherwise indicated.
   2. Ends: Capped or plugged.
   3. Motorized Operating Mechanisms: Coordinate headrail with motorized operator requirements. Provide headrail acceptable to blind and motorized operator manufacturers and suitable for applications indicated.
   4. Manual Lift Mechanism:
      a. Lift-Cord Lock: Variable; stops lift cord at user-selected position within blind full operating range.
      b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
      a. Tilt: Full.
      b. Tilt: Two-direction, positive stop or lockout limited at an angle of 80 degrees from horizontal, both directions.
      d. Over-Rotation Protection: Manufacturer’s detachable operator or slip clutch to prevent over rotation of gear.
   6. Manual Lift-Operator and Tilt-Operator Lengths: Length required to extend to 48 inches (1219 mm) above floor level when blind is fully closed.
   8. Integrated Headrail/Valance: Curved face.

D. **Bottom Rail:** Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
   1. Type: Top contoured to match crowned shape of slat Bottom contoured to minimize light gaps.
E. Lift Cords: Manufacturer's standard braided cord.

F. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
   1. Type: Braided cord.

G. Valance: Manufacturer's standard.

H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
   1. Type: Wall.
   2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

I. Colors, Textures, Patterns, and Gloss:
   2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

2.3 HORIZONTAL LOUVER BLIND FABRICATION

A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
   1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).

C. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.

D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.

E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

F. Color-Coated Finish:
   1. Metal: For components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
2.4 MOTORIZED OPERATORS

A. General: Provide factory-assembled blind-operator systems of size and capacity and with features, characteristics, and accessories suitable for conditions indicated and recommended by motorized operator and blind manufacturers for use with blinds indicated, complete with electric motors and factory-prewired motor controls, power disconnect switches, enclosures protecting controls and operating parts, and accessories required for reliable operation without malfunction. Include wiring from motor controls to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

1. Headrail: As specified for blind(s) operated by motorized operator.
2. Function: Lift and tilt.
3. Electrical Components: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

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.

C. Electric Motors: Comply with NEMA designation, temperature rating, service factor, and efficiency requirements.


D. Remote Controls: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting. Provide the following for remote-control activation of blinds:

1. Individual/Group Control Stations: Maintained-contact, three-position, rocker-style, wall-switch-operated control station with open, close, and center off functions for individual and group control.
2. Microprocessor Controls: Electronic programmable means for setting, changing, and adjusting control features; isolated from voltage spikes and surges.

E. Limit Switches: Adjustable switches, interlocked with motor controls and set to stop blind automatically at fully raised and fully lowered positions.

F. Operating Features:

1. Group switching with integrated switch control; single faceplate for multiple switch cutouts.
2. Capable of interface with <Insert description> control system.
3. Capable of accepting input from building automation control system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 INSTALLATION

A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.

1. Locate so exterior slat edges are not closer than 1 inch (25 mm) from interior faces of glass and not closer than 1/2 inch (13 mm) from interior faces of glazing frames through full operating ranges of blinds.
2. Install mounting and intermediate brackets to prevent deflection of headrails.
3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

B. Electrical Connections: Connect motorized operators to building electrical system.

3.3 ADJUSTING

A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.

C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

END OF SECTION 12 2113
SECTION 12 2413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Motor-operated roller shades [solar] [and] [room darkening].
2. Shade accessories.
3. Control systems

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
2. Section 079200 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.
3. Section 2600000 - Electrical: Connection to electrical motor control system and lighting control system components.

1.3 REFERENCES

A. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE):


B. Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA) WD1-1999 (R2005) - General Color requirements for Wiring Devices.

C. ASTM International (ASTM):


D. Underwriters Laboratories, Inc. (UL):
1. 1310 – Class 2 Power Units.
2. 508 – Industrial Control Equipment.

1.4 SYSTEM DESCRIPTION


B. Controls: [Wall mounted Keypads in combination with software enabled shades tied to campus Quantum solution.]

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Descriptive literature and details for each product type including materials, finishes, construction, and dimensions of individual components, profiles, and mounting requirements.
   2. Wiring diagrams, details on integration to lighting control systems, AV systems, and building management systems, installation instructions, and operating instructions.
   3. Current certificates showing that line voltage components of system are either [UL Listed or UL recognized.]

B. Shop Drawings:
   1. Shade schedule indicating room number, opening sizes, quantities and key to details.
   2. Head, jamb and sill details, and mounting dimension requirements for each product and mounting condition.
   3. One-line wiring system diagrams including connection details and overall arrangement of shades and control locations.

C. Samples.
   1. Fabric samples showing [each specified color.] [manufacturer’s full range of available colors.]
   2. Samples showing available color and finish selections for controls.

D. Quality Control Submittals:

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than two units.
1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Minimum 5 years experience in manufacture of precision-engineered, low-voltage motorized shading systems.
   2. Assign responsibility for design, engineering, installation, and performance of window shade system to single manufacturer and their qualified dealers and installers.
   3. Furnish shading system and electrical control equipment for complete installation [and single source responsibility of shading and lighting control].
   4. Qualified to supply specified products and to honor claims against product presented in accordance with warranty.

B. Installer Qualifications: Qualified to install and commission specified products by prior factory training, experience, demonstrated performance, and acceptance of any requirement of the manufacturer, subsidiary of the manufacturer, or licensed agent.

C. Mockups:
   1. Provide mockup of window shade complete with selected shade fabric including sample of seam when applicable.
   2. Locate where directed.
   3. Approved mockup may [not] remain as part of the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Do not deliver shades until concrete, masonry, plaster, painting, and other wet work is complete and dry.

C. Deliver shades to project in protective packaging, labeled to identify each shade for each opening.

D. Include installation, programming, and maintenance instructions.

1.10 FIELD CONDITIONS

A. Maintain environmental conditions in installation areas within manufacturer's recommended limits:
   1. Ambient operating temperature: 32 to 104 degrees F.
   2. Humidity: 0 to 90 percent, non-condensing.

B. Do not install products under environmental conditions outside manufacturer's absolute limits.

C. Do not install shade system until building is operating at ambient temperature and humidity ranges that are consistent with those intended for buildings ultimate use.
1.11 COORDINATION

A. Coordinate pre-wiring of system utilizing manufacturer’s approved low voltage wiring to each shade drive location.

B. Fabricate shades after obtaining field dimensions for each opening.

C. Coordinate construction of surrounding conditions to allow for timely field dimension verification.

1.12 WARRANTY

A. Provide manufacturer’s 2 year parts and labor and 8 years limited parts warranty for defective equipment.

1.13 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to qualified dealer or installer.

B. Make replacement parts available for minimum of ten years after date of manufacture.

C. Provide 24-hour, 7-day a week technical support to troubleshoot system wiring and aid in system programming.

D. Provide on-site service support within 24 hours anywhere in continental United States and within 72 hours.

E. Offer renewable service contract on yearly basis to include parts, factory labor, and annual training visits. Make service contracts available up to ten years after date of system startup completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design (Substitutions are Not permitted): Lutron Electronics.

2.2 SYSTEM REQUIREMENTS

A. Roller Shade Description

1. Lutron Sivoia QS 24V low voltage motor-operated shade.
3. Audible noise: Maximum 50 dBA measured 3 feet from electronic drive unit. No audible clicks when motor starts or stops.
4. Include 10 year power failure memory for preset stops, open and close limits, shade grouping and subgrouping, and system configuration.
5. Operate independently, without use of external group controllers.
B. System Description

1. Control shade speed for tracking within plus or minus 0.0625 inch throughout entire travel.
2. Integrate directly with skylight shades, roman shades and drapery tracks incorporating electronic drive units.
3. Systems with multiple electronic drive units electronically synchronized to start, stop, and move in unison.
4. Allow for maximum of 100 devices including roller shades, skylight shades, drapery tracks, keypads, lighting controls, and power supplies.
5. Allow for 100 zones including roller shades, skylight shades, drapery tracks, and lighting zones.
6. System devices, including shades and lighting controls, connected through common communication link.

C. Grouping:

1. Keypads can control any electronic drive unit without separate group controller.
2. System groups and subgroups configured at point of control without rewiring and without access to electronic drive unit.
3. System may contain multiple electronic drive units.

D. Integration:

1. Electronic drive units integrate with lighting controls by same manufacturer without interfaces.
2. Contact closure, RS232, and Ethernet interfaces available to interface with audio/visual equipment and security systems.

E. System Performance:

1. One-touch control of shades by means of keypad or lighting control.
2. Capable of stopping within accuracy of 0.125 inch at any point between open and close limits.
3. Store over 250 programmable stop points, including open, close, and any other position.
4. Presets set by 5-second button push and hold from keypad or lighting control.
5. Open and close limits programmable from electronic drive unit, lighting control, wall-mounted keypad, or shade software.
6. Electronic drive units, keypads, and lighting controls contain microprocessors, allowing high level programming from any source.

F. Shade System Control

1. Basis of Design:
   a. Lutron Quantum System for lights and shades.
2. Enables shade control system software to control and monitor Sivoia QS shades.
3. Integral control station devices, shades, lighting loads, to a single system with:
   a. Distributed architecture, provides fault containment. Single hub failure loss of power does not compromise shades connected to other shade control system hubs.
4. Furnished with astronomical time clock and solar clock to track the position of the sun to control the shades and limit penetration of direct sunlight.
5. Maintains a backup of the programming in a non-volatile memory capable of lasting more than 10 years without power.

G. Shade Control System Computers

1. Computers:
   a. System PC (Desktop/Laptop):
      1) Suitable for occasional programming, monitoring, and control of shade control system.
      2) Unless otherwise indicated, computer(s) to be provided by lighting and shade control system manufacturer.
   b. Computers Provided by Shade Control System Manufacturer: Computer software to be preinstalled and tested prior to shipping.

H. Shade Control System Software

1. Provide system software license and hardware that is designed, tested, manufactured, and warranted by a single manufacturer.
2. Control and Monitor Software:
   a. Basis of Design:
   b. Control of lighting and shades from one software system.
   c. Area shades can be monitored for current preset or position, shades can be opened/closed, sent to a preset, or sent to a specific non preset position.
   d. Reporting: provide reporting capability that allows the building manager to gather real-time and historical information about the system as follows: Activity report, shade level report, shade position report, sensor level report.
   e. Diagnostics: ability to check status of all equipment, Alerts and Alarms.

I. Automated Shade Control Software

1. Basis of Design:
   a. Lutron Hyperion System
2. Open loop solar adaptive algorithm to minimize the penetration depth of direct sunlight.
3. Manual override capability for occupants via wall-mounted keypad or Q-admin software.
4. Automatic overrides utilizing a local mullion sensor where excessive brightness or glare occurs.
5. Shades along same façade to start, stop, and track in unison to maintain a consistent exterior aesthetic. Visor position limits the maximum amount of light entering a space.
   a. Rooftop sensor not acceptable.
   b. Monitor exterior light conditions and provides automatic override of system on dark cloudy days or in the presence of shades from neighboring buildings.
c. Monitors exterior light conditions and provides automatic override of system during excessive brightness and shade goes to predetermined bright override position to maximize occupant comfort.
d. Sensors to be easily mountable to mullion and can be easily removed and repositioned without marring or damaging the surface.

2.3 ROLLER SHADES

A. Mounting:
   1. Brackets to provide symmetrical light gaps of 0.75 inch on each side of shade.
   2. Roller shade leveling adjustment allowing leveling adjustment while roller shades are mounted to brackets.
   3. Allow side-to-side adjustment up to 0.375 inch on each side while shade is mounted to bracket.
   4. Projection adjustment up to 0.50 inch.
   5. Two-piece mounting bracket providing level, projection, and shade centering adjustments from mounting bracket.
   6. Provide dual brackets permit two shades rollers to be mounted in same opening where applicable.
   7. Coupling:
      a. Single electronic drive unit capable of driving up to six shades with coupling pin.
      b. System offers 1.5 inch minimum light gaps between panels.
      c. Pin allows for precision adjustment of bottom bar levels without removing roller from installed point or fabric from roller tube.

B. Shade Tube: Fabric connected to tube using double-sided adhesive strip with minimum of one turn of fabric on roller before working section of fabric starts.

C. Fabric:
   1. Pass NFPA 701 large and small scale tests.
   2. Where applicable, seal shade fabric or treat PVC-coated fabric edges to prevent fraying.
   3. Fabric selection:
      a. Sheer:
      b. Blackout:
   4. Bottom Bar: 1 inch wide x 0.1875 inch thick extruded aluminum enclosed on all sides in thermally sealed pocket across bottom of shading fabric.

D. Bottom Bar: 1 inch wide x 0.1875 inch thick extruded aluminum enclosed on all sides in thermally sealed pocket across bottom of shading fabric.

2.4 ACCESSORIES

A. Wall Mounted Controls:
   1. Low voltage, Lutron Seetouch QS Keypad, 24V DC, complete with cover plate, as selected by Architect from standard manufacturer’s range.
   2. Visible parts ultraviolet color stabilized, tested to ASTM D4674.
   3. Engraved wall stations with button descriptions.
4. Capable of controlling both lights and shades from one button.

B. Power Supplies:
   1. Electronic drive units powered with 24 VDC from approved power supply; power supply via NEC Class 2 power source.
   2. Provide power panel including 10 individual outputs per panel.

C. SOURCE QUALITY CONTROL
   1. Perform full-function testing on completed assemblies prior to shipment.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.
   
   B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER-SHADE INSTALLATION
   A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
   
   B. Install shades to provide smooth operation.
   
   C. Locate controls [where directed.] [____.]
   
   D. Electrical Connections: Connect motor-operated roller shades to building electrical system.
   
   E. Connect to [lighting control] [audio/visual] [____] system.

3.3 ADJUSTING
   A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION
   A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.
   
   B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 12 2413
SECTION 12 4813 - ENTRANCE FLOOR MATS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roll-up rail mats.
2. Resilient entrance mats.
3. Recessed frames.

B. Related Requirements:

1. Section 124816 "Entrance Floor Grilles" for rigid floor grilles and frames.

1.3 COORDINATION

A. Coordinate size and location of recesses in concrete to receive floor mats and frames.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for floor mats and frames.

B. Shop Drawings:

1. Items penetrating floor mats and frames, including door control devices.
2. Divisions between mat sections.
3. Perimeter floor moldings.

C. Samples: For the following products, in manufacturer's standard sizes:

1. Floor Mat: Assembled sections of floor mat.
2. Tread Rail: Sample of each type and color.
3. Frame Members: Sample of each type and color.
1.5 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For floor mats and frames to include in maintenance manuals.

1.6 QUALITY ASSURANCE
   A. Comply with the most current edition of the Northwestern University Design Standards.

PART 2 - PRODUCTS

2.1 ENTRANCE FLOOR MATS AND FRAMES, GENERAL
   A. Structural Performance: Provide roll-up rail mats and frames capable of withstanding the following loads and stresses within limits and under conditions indicated:
      1. Uniform floor load of 300 lbf/sq. ft. (14.36 kN/sq. m).
      2. Wheel load of 350 lb (159 kg) per wheel.

2.2 ROLL-UP RAIL MATS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. Babcock-Davis
      2. Balco, Inc.
      3. C/S Group
      4. JL Industries, Inc.; a division of the Activar Construction Products Group
      5. Kadee Industries, Inc.
      6. Matco International
      7. Mats Incorporated
      8. Nystrom, Inc.
      9. Pawling Corporation
   B. Roll-up, Aluminum-Rail Hinged Mats: Extruded-aluminum tread rails 1-1/2 inches (38 mm) wide by 3/8 inch (9.5 mm) thick, sitting on continuous vinyl cushions.
      1. Tread Inserts: [Plain serrated aluminum treads] [Textured-surface, resilient vinyl] [Ribbed-design-surface, resilient vinyl] [Mineral abrasive particles bonded to or embedded in vinyl] [Aluminum-oxide or silicon-carbide grit in epoxy matrix] [1/4-inch- (6.4-mm-) high, 28-oz./sq. yd. (950-g/sq. m) weight, level-cut, nylon-pile, fusion-bonded carpet] <Insert tread inserts>.
      2. Colors, Textures, and Patterns of Inserts: As selected by Architect from full range of industry colors.
      3. Rail Color: [Mill finish] [Clear] [Light bronze] [Medium bronze] [Dark bronze] [Black] [Match Architect's sample] As selected by Architect from full range of industry colors and color densities.
5. Mat Size: As indicated.

C. Roll-up, Vinyl-Rail Hinged Mats: Vinyl-acrylic tread rails 1-1/2 inches (38 mm) wide by 3/8 inch (9.5 mm) thick, with slotted or perforated hinges.

1. Tread Inserts: [Textured-surface, resilient vinyl] [Ribbed-design-surface, resilient vinyl] [Mineral abrasive particles bonded to or embedded in vinyl] [Aluminum-oxide or silicon-carbide grit in epoxy matrix] [1/4-inch- (6.4-mm-) high, 28-oz./sq. yd. (950-g/sq. m) weight, level-cut, nylon-pile, fusion-bonded carpet] <Insert tread inserts>.

2. Colors, Textures, and Patterns of Inserts: As selected by Architect from full range of industry colors.

3. Rail Color: As selected by Architect from full range of industry colors.


5. Mat Size: As indicated.

2.3 RESILIENT ENTRANCE MATS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amarco Products.
2. Babcock-Davis.
5. Kadee Industries, Inc.
7. Pawling Corporation.

B. Carpet-Type Mats: [Nylon] [Polypropylene] [Olefin] [Polyester] carpet bonded to 1/8- to 1/4-inch- (3.2- to 6.4-mm-) thick, flexible vinyl backing to form mats 3/8 or 7/16 inch (9.5 or 11 mm) thick with nonraveling edges.

1. Colors, Textures, and Patterns: As selected by Architect from full range of industry colors.

2. Mat Size: As indicated.

C. Graphics: Custom inlaid or woven-in graphic [design] [logo] [emblem] [characters] as indicated.

2.4 FRAMES

A. Recessed Frames: Manufacturer's standard extrusion.

1. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6061-T6 or Alloy 6063-T5, T6, or T52.

   a. Color: [Mill finish] [Clear] [Light bronze] [Medium bronze] [Dark bronze] [Black].
2.5 CONCRETE FILL AND GROUT MATERIALS
   A. Provide concrete fill and grout equivalent in strength to cast-in-place concrete slabs for recessed mats and frames. Use aggregate no larger than one-third fill thickness.

2.6 FABRICATION
   A. Floor Mats: Shop fabricate units to greatest extent possible in sizes indicated. Unless otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.
   B. Recessed Frames: As indicated, for permanent recessed installation, complete with corner pins or reinforcement and anchorage devices.
      1. Fabricate edge-frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.
   C. Coat concealed surfaces of aluminum frames that contact cementitious material with manufacturer's standard protective coating.

2.7 ALUMINUM FINISHES
   A. Mill finish.
   B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
   C. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

2.8 COPPER-ALLOY (BRONZE) FINISHES
   A. Finish designations prefixed by CDA comply with the system established by the Copper Development Association for designating copper-alloy finishes, as defined in NAAMM's "Metal Finishes Manual for Architectural and Metal Products."
      1. Remove tool and die marks and stretch lines, or blend into finish.
      2. Grind and polish surfaces to produce uniform, directionally textured, polished finish, free of cross scratches. Run grain of directional finishes with long dimension of each piece.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Examine substrates and floor conditions for compliance with requirements for location, sizes, minimum recess depth, and other conditions affecting installation of floor mats and frames.
   B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 INSTALLATION

A. Install recessed mat frames to comply with manufacturer's written instructions. Set mat tops at height recommended by manufacturer for most effective cleaning action; coordinate tops of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.

1. For installation in terrazzo flooring areas, provide allowance for grinding and polishing of terrazzo without grinding surface of recessed frames. Coordinate with other trades as required.
2. Install necessary shims, spacers, and anchorages for proper location, and secure attachment of frames.
3. Install grout and fill around frames and, if required to set mat tops at proper elevations, in recesses under mats. Finish grout and fill smooth and level.

B. Install surface-type units to comply with manufacturer's written instructions at locations indicated; coordinate with entrance locations and traffic patterns.

3.3 PROTECTION

A. After completing frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 12 4813
SECTION 12 4816 - ENTRANCE FLOOR GRILLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes recessed floor grilles and frames.

1.3 COORDINATION

A. Coordinate size and location of recesses in concrete to receive floor grilles and frames.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for entrance floor grilles and foot grilles.

B. Shop Drawings:

1. Items penetrating floor grilles and frames, including door control devices.
2. Divisions between grille sections.
3. Perimeter floor moldings.

C. Samples: For the following products, in manufacturer’s standard sizes:

1. Floor Grille: Assembled section of floor grille.
2. Frame Members: Sample of each type and color.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For floor grilles and frames to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Comply with the most current edition of the Northwestern University Design Standards.

1.7 FIELD CONDITIONS

A. Field Measurements: Indicate measurements on Shop Drawings.
2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   2. Kadee Industries, Inc.
   4. Nystrom, Inc.
   5. Pawling Corporation.

2.2 ENTRANCE FLOOR GRILLES, GENERAL

A. Structural Performance: Provide floor grilles and frames capable of withstanding the following loads and stresses:
   1. Uniform floor load of 300 lb/sq. ft. (14.36 kN/sq. m).
   2. Wheel load of 350 lb (159 kg) per wheel.


2.3 FLOOR GRILLES

A. General: Provide manufacturer's standard floor-grille assemblies consisting of treads of type and profile indicated, interlocked or joined together by cross members, and with support legs (if any) and other components needed to produce a complete installation.

B. Aluminum Floor Grilles: Provide manufacturer's standard floor grilles with extruded members, top-surfaced tread rails, and as follows:
   2. Tread Rail Spacing: 1-1/2 inches (38 mm) o.c. with 1/8- to 3/16-inch- (3.2- to 4.8-mm-) wide openings between treads.
   3. Top Surface: Fusion-bonded, level-cut-pile nylon carpet insert; 1/4 inch (6.4 mm) high, 28 oz./sq. yd. (950 g/sq. m).
      a. Top Surface Color: As selected by Architect from manufacturer's full range of industry colors.
   4. Grille Size: As indicated.

C. Stainless-Steel Floor Grille: Type 304.
   1. Surface Treads: 0.071-by-0.177-inch (1.8-by-4.49-mm) wire with 0.125-inch- (3.17-mm-) wide openings between wires.
2. Support Rods: Spaced 1 inch (25.4 mm) o.c., welded to each wire.
3. Mat Grating: 5/8 inch (15.8 mm) deep.
4. Pit Grating: 1-1/8 inches (28.5 mm) deep.
5. Stainless-Steel Finish: No. 4.

D. Lockdown: Manufacturer’s standard Hidden.

2.4 FRAMES

A. Provide manufacturer’s standard frames of size and style for grille type, for permanent recessed installation in subfloor, complete with installation anchorages and accessories. Unless otherwise indicated, fabricate frame of same material and finish as grilles.

2.5 SUPPORT SYSTEM

A. Drainage Pit Applications: Provide manufacturer’s special deep-pit frame and support extrusion system with intermediate support beams, sized and spaced as recommended by manufacturer for indicated spans and equipped with vinyl support cushions.

2.6 DRAIN PANS

A. Provide manufacturer’s standard, 0.060-inch- (1.52-mm-) thick, aluminum sheet drain pan with NPS 2 (DN 50) drain outlet for each floor-grille unit. Coat bottom of pan with protective coating recommended by manufacturer. Provide joint sealant between the concrete slab and metal pan.

2.7 MATERIALS

A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of Alloy 5005-H15.

B. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6061-T6 or Alloy 6063-T5, T6, or T52 as standard with manufacturer. Coat surface of frame in contact with cementitious materials with manufacturer’s standard protective coating.

2.8 FABRICATION

A. Shop fabricate floor grilles to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each grille as a single unit; do not exceed manufacturer’s recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in grilles are necessary, space symmetrically and away from normal traffic lanes.

B. Fabricate frame members in single lengths or, where frame dimensions exceed maximum available lengths, provide minimum number of pieces possible, with hairline joints equally spaced and pieces spliced together by straight connecting pins.

2.9 ALUMINUM FINISHES

A. Mill finish.
2.10 STAINLESS-STEEL FINISHES

A. Mill finish.

B. Directional Satin Finish: No. 4.
   1. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and floor conditions for compliance with requirements for location, size, minimum recess depth, and other conditions affecting installation of floor grilles and frames.

B. Examine roughing-in for drainage piping systems to verify actual locations of piping connections before floor grille and frame and drain pan installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install recessed floor grilles and frames and drain pans to comply with manufacturer's written instructions at locations indicated and with top of floor grilles and frames in relationship to one another and to adjoining finished flooring as recommended by manufacturer. Set floor-grille tops at height for most effective cleaning action. Coordinate top of floor-grille surfaces with doors that swing across grilles to provide clearance under door.

3.3 PROTECTION

A. After completing frame installations, provide temporary filler of plywood or fiberboard in floor-grille recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 12 4816