

DIVISION 10 26 16.16

1000/1000FV Lighted Handrail

PART 1 – GENERAL

1.01 SUMMARY

- A. Handrail with ambient lighting systems for pedestrian safety and wall protection

1.02 SECTION INCLUDES

- A. 1000/1000FV LED Handrails

1.03 RELATED SECTIONS

- A. Division 09 Section (Wall Finishes)
- B. Division 25 Section (Integrated Automation Facility Controls)
- C. Division 26 Section (Electrical / Lighting)

1.04 REFERENCES

- A. American National Standards Institute (ANSI)
- B. American Society for Testing and Materials (ASTM)
- C. Americans with Disabilities Act (ADA)
- D. National Building Code of Canada (NBC)
- E. National Fire Protection Association (NFPA)
- F. Society of Automotive Engineers (SAE)
- G. Underwriters Laboratory (UL)
- H. Underwriters Laboratory of Canada (ULC)
- I. Uniform Building Code (UBC)
- J. National Electrical Code (NEC)
- K. Ingress Protection Rating System (IP)

1.05 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide Handrail Systems that conform to the following requirements of regulatory agencies and the quality control of IPC Door and Wall Protection Systems, Inpro Corporation.
 - 1. Fire Performance Characteristics: Provide UL Classified handrails conforming with NFPA Class A fire rating. Surface burning characteristics, as determined by UL-723 (ASTM E-84), shall be flame spread of 10 and smoke development of 350 - 450. Provide ULC (Canada) listed handrails conforming to the requirements of the National Building Code of Canada 2010, Subsection 3.1.13. Surface burning characteristics, as determined by CAN/ULCS102.2, shall be flame spread of 15 and smoke developed of 35.
 - 2. Self-Extinguishing: Provide handrails with a CC1 classification, as tested in accordance with the procedures specified in ASTM D-635-74, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position, as referenced in UBC 52-4-1988.

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3. Impact Strength: Provide rigid vinyl profile materials that have an Impact Strength of 30.2 ft-lbs./inch of thickness as tested in accordance with the procedures specified in ASTM D-256-90b, Impact Resistance of Plastics.
 4. Chemical and Stain Resistance: Provide handrails that show resistance to stain when tested in accordance with applicable provisions of ASTM D-543.
 5. GREENGUARD Certified: Provide GREENGUARD Certified material. Profiles shall meet the requirements of GREENGUARD Certification Standards for Low-Emitting Products and GREENGUARD Product Emission Standard for Children & Schools.
 6. Fungal and Bacterial Resistance: Provide rigid vinyl that does not support fungal or bacterial growth as tested in accordance with ASTM G-21 and ASTM G-22.
 7. Color Consistency: Provide components matched in accordance with SAE J-1545 - (Delta E) with a color difference no greater than 1.0 units using CIE Lab, CIE CMC, CIE LCh, Hunter Lab or similar color space scale systems.
- B. Performance Requirements: Provide Light Emitting Diode (LED) Assemblies that confirm to the following requirements of regulatory agencies and the quality control of IPC Door and Wall Protection Systems, Inpro Corporation.
1. Ingress Protection Rating: Provide LED tape with an ingress protection rating of IP54, appropriate for damp environments.
 2. LED Binning Tolerance: Provide LED tape with a max color tolerance of 2-Step MacAdam Ellipse
 3. Color Rendering: Provide LED tapes with CRI Minimum of 90.
 4. Lighting Safety: Provide power driver certified to UL/ULC 8750, Type HL ANSI/UL1310
 5. Restrictions of Hazardous Substances: Provide LED lighting assemblies which are RoHS Compliant
 6. Sound Rating: Sound Pressure Level Class A (dba 16.8 @ 20%; 16.4 @ 100%)

1.06 SUBMITTALS

- A. Product Data: Manufacturer's printed product data for each product indicated in this section.
- B. Detail Drawings: Mounting details with the appropriate fasteners for specific project substrates.
- C. Samples: Verification samples of handrail, 8" (203mm) long, in full-size profiles of each type and color indicated.
- D. Manufacturer's Installation Instructions: Printed installation instructions for each handrail

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite.
- B. Inspect materials at delivery to assure that specified products have been received.

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- C. Store in original packaging in a climate-controlled location away from direct sunlight.
- D. Do not expose electrical systems to static discharge.

1.08 PROJECT CONDITIONS

- A. Environmental Requirements: Install products in an interior climate-controlled environment.
- B. Reference sections as required for completion of work that would affect the application of product performance.
 - 1. Not all-inclusive:
 - a. Section 06 10 00 Rough Carpentry: Blocking for handrail anchors.
 - b. Section 09 21 16 Gypsum Board Assemblies: Placement of supports in stud wall.
 - c. Section 25 56 00 Integrated Automation Control of Electrical Systems
 - d. Section 26 00 00 Electrical: Ensure power supply, conduit, junction box locations are established.
 - e. Section 26 09 23 Lighting Control Devices: Occupancy Sensors, Light level control devices, etc...

1.09 WARRANTY

- A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.
- B. Electrical Components carry a 3-year Warranty by vendor.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Basis-Of-Design Product: Inpro Corporation, IPC Door and Wall Protection Systems PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407, Website: www.inprocorp.com.
 - 1. Submit comparable products of one the following for approval by architect:
 - a. Insert name of manufacture of comparable product
 - b. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements
 - c. Provide specified product; Owner will not consider substitution requests.

2.02 MANUFACTURED UNITS

- A. Handrail Profile
 - 1. 1000 Handrail, 4-5/16" (110mm) height x 1-5/8" (41mm) gripping diameter, extends 3-1/8" (79mm) from wall. Options: Curved handrail, specify radius. Minimum radius - 3 feet (.91m) Returns and corners include reveals.
 - a. LED Tape:
 - 1) Standard: Color temperature 4000k, 223-lumen output
 - 2) Optional:
 - a) 2200K, 177-lumen output

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- b) 2400k, 181-lumen output
 - c) 2700K, 221-lumen output
 - d) 3000k, 227-lumen output
 - e) 3500k, 231-lumen output
 - f) 5000k, 237-lumen output
- b. Power Supply shall be a single channel. Capable of powering 32 linear feet of LED Tape
- 1) Dimming Capabilities: Forward Phase (MLV), TRIAC, Reversed Phase (ELV), 0-10V, PWM
 - 2) Transformer Classification 2
 - 3) Input Voltage: 100v-277v AC.
 - 4) Output Voltage: DC 24V,
 - 5) Amp Rating: 4
 - 6) 47/63 HZ
2. 1000FV Handrail, 4-5/16" (110mm) height x 1-5/8" (41mm) gripping diameter, extends 3-1/8" (79mm) from wall. Handrail has a full-wrap woodgrain pattern. Returns and corners include reveals.
- a. LED Tape:
- 1) Standard: Color temperature 4000k, 223-lumen output
 - 2) Optional:
 - a) 2200K, 177-lumen output
 - b) 2400k, 181-lumen output
 - c) 2700K, 221-lumen output
 - d) 3000k, 227-lumen output
 - e) 3500k, 231-lumen output
 - f) 5000k, 237-lumen output
- b. Power Supply shall be a single channel. Capable of powering 32 linear feet of LED Tape
- 1) Dimming Capabilities: Forward Phase (MLV), TRIAC, Reversed Phase (ELV), 0-10V, PWM
 - 2) Transformer Classification 2
 - 3) Input Voltage: 100v-277v AC
 - 4) Output Voltage: DC 24V,
 - 5) Amp Rating: 4
 - 6) 47/63 HZ

2.03 MATERIALS

A. Extruded Vinyl:

- 1. Snap-on covers of .080" (2mm) thickness shall be extruded from chemical and stain-resistant unplasticized polyvinyl chloride (uPVC) with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth). Accent strips when used shall be of polyvinyl chloride (PVC).

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2. Snap-on lens of .050" (1.3mm) thickness shall be extruded from chemical and stain-resistant translucent unplasticized polyvinyl chloride (uPVC)
- B. Extruded Aluminum:
 1. Continuous aluminum retainer of .080" (2mm) thickness shall be fabricated from 6063-T5 aluminum with a mill finish.
- C. Injection Molded ABS:
 1. Returns & Corners shall be made of injection mold grade ABS with the addition of impact modifiers.

2.04 COMPONENTS

- A. Returns, inside corners, outside corners and brackets shall be made of injection-molded thermoplastics.
- B. Molded reveals shall have a smooth finish and shall be black.
- C. Fasteners: All mounting system accessories appropriate for substrates indicated on the drawing shall be provided.

2.05 FINISHES

- A. Vinyl Covers: Handrail colors to be selected by the architect from the IPC finish selection.
- B. Molded components: Returns, inside corners and outside corners shall be of a color matching the handrails. Surface shall have a pebblette texture.
- C. Molded Bracket: Shall be a solid color to match or compliment the handrails. Surface shall have a pebblette texture.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions in which the handrail system will be installed.
 1. Complete all finishing operations; including painting, before installation of handrail system materials.
 2. Wall surface shall be dry and free of dirt, grease and loose paint
 3. Verify that rough openings, concealed block, anchors and stall were correctly sized and located.
 4. Verify wiring is compliant with Locals, State and National electrical codes, and wiring pass through is correctly located.

3.02 PREPARATION

- A. General: Prior to installation, clean substrate to remove dust, debris and loose particles.
- B. Electrical: Prior to installation of handrail and lighting system. Ensure the power supply is mounted and wired into the correct circuit. Ensure conduit and J-box are located corrected and compliant with Local, State, and National Electrical Code. When wiring DC low voltage ensure the polarity on wires is correct and functional before mounting rail.

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3.03 INSTALLATION

- A. General: Locate handrail as indicated on approved detail drawings for the appropriate substrate and in compliance with the IPC installation instructions. Install handrail level and plumb at the height indicated on the drawings.
- B. Installation of 1000/1000FV Handrails:
 - 1. Cut the aluminum retainer to the desired length, allowing 3-3/8" (86mm) for each return, 1/4" (7mm) for each outside corner and 4-7/8" (124mm) for each inside corner. Allow 1/4" (6mm) for each 135 degree outside corner and 2-1/16" (52mm) from the corner of the wall for each 135 degree inside corner.
 - 2. Locate bracket mounting locations on the retainer per installation instructions. It is recommended that brackets are installed 4" (102mm) from the ends of a run. Spacing of brackets is recommended to be a maximum of 32" (813mm).
 - 3. Dry fit the handrail run to the location, and ensure the rail is level. Mark and pre-drill holes bracket hold on wall.
 - 4. Clean the channel on the back of the handrail using denatured alcohol, and apply LED tape. Attach lead connectors where required. Run lead connector wires through returns.
 - 5. Slide reveals onto returns and corners. Attach returns, inside corners, outside corners, and brackets to the aluminum retainer.
 - 6. Cut clear lens to length, span lens into locators on back of retainer.
 - 7. Coordinate Wiring with Electrical trade before anchoring handrail assembly to the wall.
 - 8. Cut the vinyl cover to fit between the reveals on the returns and/or corners.
 - a. NOTE: Trim all factory edges square before installation. Position the vinyl cover on the aluminum retainer starting at the top of the retainer and pivoting the vinyl cover over the bottom of the retainer until it snaps into place.

3.04 CLEANING

- A. At the completion of the installation, clean surfaces in accordance with the IPC clean-up and maintenance instructions.