

Only those specifications not addressed within the Ohio School Facilities Commission Design Manual are included within this document.

Specifications define the qualitative requirements for products, materials, and workmanship upon which the content is based. They are organized into **50** Divisions and **6** digit numbering system. Section titles have been closely coordinated with the numbering system established in CSI's **New Masterformat 2004** Edition. In certain instances, section titles vary slightly from those recommended, but only where necessary to make them correspond more closely to text subject matter.

The specifications are no more than outlines compiled to establish minimum quality requirements. They do not cover all materials required for a complete Project and do not attempt to include every possible variable, particularly where doing so would require an almost unlimited number of choices. These specifications are not to be used as bid documents.

Specifying methods include both performance (a statement of required results with criteria for verifying compliance, but without unnecessary limitations on the methods for achieving the required results) and reference standard (requirements set by authority, custom, or general consensus and are established as accepted criteria). There was no attempt to establish these specifications based on proprietary specifications which identify the desired products by manufacturer's name, brand name, model numbers, type designation, or other unique characteristics.

Section format conforms to 3 part arrangement developed by CSI and accepted by the Design Professionals to achieve uniformity in locating and organizing specification content.

Streamlined language is used where possible to describe requirements for products, systems, and processes. In these instances a generic term is punctuated by a colon and then followed by a list of requirements without a linking verb such as "shall be" or "provide" which is implied by colon.

Spelling and punctuation conform as closely as possible to current standards of usage. If conflicts occur between spellings of words in the dictionary versus industry practices, the latter takes precedence.

Minimums and maximums are defined in text only where possibility of confusion exists. Otherwise, because of the nature of this document, it shall be assumed items indicated in documents are guidelines and shall be adhered to, unless discussed with state authority.

Abbreviations included in text are defined in Chapter 1.

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INDEX OF SUPPLEMENTARY SPECIFICATIONS
(see the other Chapter 9 for specifications reference for all other sections)

- 033516 Concrete Floor Hardener/Sealer
- 060565 Slatwall Paneling
- 068200 Glass Fiber-Reinforced Plastic
- 083416 Bottom Roll Slide Hanger Doors
- 083436 Revolving Darkroom Doors
- 096000 Wood Dance Floor**
- 099600 High Performance Coatings
- 112713 Dark Room Equipment
- 113100 Residential Appliances
- 116135 Pipe Grid**
- 116615 Ballet Bars**
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- 133413 Glazed Structures (Greenhouses)
- 133419 Metal Building Systems
- 233500 Vehicle Fume Exhaust Equipment
- 412223 Hoists and Cranes

END OF INDEX

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SECTION **033516**CONCRETE FLOOR **HARDENER/SEALER**

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** hardener finish for exposed interior concrete floors.

PART 2 PRODUCTS

2.01 MATERIALS

- A. **Metallic Dry-Shake Floor Hardener: Pigmented or unpigmented, factory-packaged, dry combination of Portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.**
- B. **Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of Portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.**

PART 3 EXECUTION

3.01 INSTALLATION

- A. **Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:**
1. **Uniformly apply dry-shake floor hardener at a rate of 100 lb./100 sq.ft. minimum.**
 2. **Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.**
 3. **After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.**

END OF SECTION

CONCRETE

CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

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SECTION **060565****SLATWALL PANELING**

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** display wall and miscellaneous hardware.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Display Wall – “Slatwall”: $\frac{3}{4}$ ” thick medium density fiberboard with grooves @ 3 “ o.c. with aluminum “T” extrusion with milled aluminum finish. Panel Finish to be high pressure laminate.
1. Display Wall Accessories: Provide the following:
 - a. Shelf knife bracket
 - b. 6 ball slant display arm
 - c. Straight out display arm
 - d. 14” deep tempered glass shelves

PART 3 EXECUTION (NOT USED)

END OF SECTION

WOOD, PLASTICS, & COMPOSITES

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL)

SECTION **068200**

GLASS FIBER-REINFORCED PLASTIC

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for special wall surfaces, including** fiberglass reinforced plastic panels.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wall (ceiling) panels shall be of polyester resin, reinforced with glass fiber in a random, chopped-strand mat.
1. **Performance Properties:**
 - a. **Class A flamespread of less than 25, smoke developed less than 450 per ASTM E84.**
 - b. **Barcol Hardness: 35 per ASTM D 2583.**
 - c. **Meets USDA/FSIS requirements.**
- B. Fasteners and Accessories: Standard nylon or metal drive rivets and vinyl molding strips.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 083416**BOTTOM ROLL SLIDE HANGER DOORS****PART 1 GENERAL****1.01 SUMMARY**

- A. **Qualitative requirements for** bottom roll slide hanger doors.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. **Bottom Roll Slide Hanger Doors:**
1. Frame and Panels: Galvanized steel frame and steel panels.
 2. Panel Profile: Flat
 3. Track Type: Standard track
 4. Bottom Rollers: Solid steel with tapered roller bearings and a greasable axle assembly.
 5. Operation: Power driven bottom rollers with manual release clutches.
- B. **Auxiliary Materials:**
1. Lifting handles and locking bars
 2. Vision panels
 3. Pass doors
 4. Automatic reversing control for bottom bar for electrically operated sectional overhead doors.

PART 3 EXECUTION (NOT USED)**END OF SECTION**

OPENINGS

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL)

SECTION **083436**

REVOLVING DARKROOM DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for revolving** darkroom doors.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pre-fabricated revolving darkroom door
1. Frame and Panels: Aluminum frame and ABS plastic panels.
 2. Panel finish: Pebble
 3. Color: Standard black
 4. ADA wheelchair access compliant including ramp accessories
 5. Push out emergency egress capability

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 096000

WOOD DANCE FLOOR

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Qualitative requirements for a wood dance floor.

1.02 PROJECT CONDITIONS

- A. Moisture Content: At time of delivery, average moisture content of wood flooring to be 7 to 10 percent.
- B. Conditioning: Do not install wood flooring until spaces are enclosed and at approximate humidity condition planned for occupancy. Condition wood for 5 days before start of installation by placing in spaces to receive flooring and maintaining ambient temperature between 65 and 75 degrees F (18 and 24 degrees C) before, during, and after installation. Open sealed packages of wood flooring to permit natural adjustment of moisture content and allow flooring to acclimate to the room conditions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pad: Dance, ¾ DPM (50 durometer)
- B. Plywood: 2 layers of 15/32 inch thick 4x8 APA structural rated sheathing, Exposure I (CD-X), Fir or Southern Pine.
- C. Flooring: 7/16 inch by 13/16 inch by 9 inch, Seconds and Better, Square Edge, Edge Grain, Kiln Dried, Northern Hard Maple.
- D. Base: Vented.
- E. Finish Materials: Oil modified polyurethane sealer and finish.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where direct application of wood flooring to concrete substrate is indicated, test for dryness before proceeding with installation. Check levelness of concrete substrate to ensure not more than 1/8 inch deviation in any direction when checked with a 10 foot straight edge. Grind down high spots or fill in low spots to correct improper conditions.
- B. Concrete Slabs: Verify that slabs are dry according to test methods recommended by flooring manufacturer or, if none, by test methods in NOFMA's "Installing Hardwood Flooring."
 - 1. When concrete slabs are tested according to ASTM F1869, Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride, 4-1/2 pounds of water/1000 sq.ft. of slab in a 24 hour period is generally acceptable as a maximum moisture-emission level.

END OF SECTION

FINISHES

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL)

SECTION 099600

HIGH PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Qualitative requirements for water-based epoxy floor paint coating system.

1.02 QUALITY ASSURANCE

- A. Master Painters Institute (MPI) Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List".

PART 2 PRODUCTS

2.01 MATERIALS

- A. Epoxy Coatings
 - 1. Water-Based Epoxy Floor Paint

PART 3 EXECUTION

3.01 INTERIOR COATING SCHEDULE

- A. Concrete Substrates, Horizontal Surfaces
 - 1. Water-Based Epoxy Floor Paint System
 - a. Prime Coat: Water-based epoxy floor paint, MPI #93.
 - b. Topcoat: Water-based epoxy floor paint, MPI #93.

END OF SECTION

SECTION **112713**

DARK ROOM EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** dark room equipment.

1.02 QUALITY ASSURANCE

- A. Regulations: OSHA, EPA compliance, ADAAG and local accessibility requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide products specifically designed for intended use:
1. Print and film processing sink units of epoxy resin fiberglass or stainless steel.
 2. Cabinetry and work surfaces **plastic** laminate with built in U.L. approved view lights and light tight drawers where needed.
 3. Safe lights and in-use warning lights.

PART 3 EXECUTION (NOT USED)

END OF SECTION

EQUIPMENT

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL)

SECTION 113100

RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SUMMARY

A. Qualitative requirements for residential equipment.

1. Kitchen area appliances
2. Laundry area appliances

1.02 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with provisions of the following product certifications:

1. **Electrical Appliances:** Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
2. **UL and NEMA Compliance:** Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
3. **AGA and ANSI Standards:** Provide gas-burning appliances that carry the design certification seal of AGA and that comply with ANSI Z21-Series standards.
4. **NAECA:** Provide residential appliances that comply with NAECA standards.

B. Regulatory Requirements, Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. **Operable Parts:** Provide controls with forward reach no higher than 48 inches above the floor, horizontal front reach no more than 25 inches, horizontal side reach no more than 24 inches, and that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. **Range or Cooktop:** Provide knee clearance for forward approach of 27 inches high, 30 inches wide, and 11 inches horizontally; toe space clearance of 9 inches high and 17 inches horizontally; with insulated underside of cooktop to prevent burns, shocks, or abrasions. Provide top surface 34 inches above the floor, with controls that do not require reaching across burners.
3. **Refrigerator/Freezer:** Provide 50 percent of freezer space within 54 inches of the floor.

C. AHAM Standards: Provide appliances that comply with the following AHAM standards:

1. **Dishwashers:** AHAM DW-DW1
2. **Electric Ranges:** AHAM ER-1
3. **Clothes Dryers:** AHAM HLD-1
4. **Refrigerators:** AHAM HRF-1
5. **Freezers:** AHAM HRF-1

PART 2 PRODUCTS

2.01 MATERIALS

- A. Kitchen Appliances:
 - 1. Ranges, electric
 - 2. Range hoods, ventilating type
 - 3. Refrigerator/freezer
 - 4. Undercounter refrigerators
 - 5. Microwave ovens
 - 6. Dishwashers
 - 7. Garbage disposals

- B. Laundry Appliances:
 - 1. Clothes washers
 - 2. Clothes dryers, electric

PART 3 EXECUTION (NOT USED)

END OF SECTION

EQUIPMENT

CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

SECTION 116135

PIPE GRID

PART 1 GENERAL

1.01 SUMMARY

- A. Qualitative requirements for dark pipe grid.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pipe Grid: 5'0" increments both directions, centered in room.
 - 1. Pipe: ASTM A 53, standard weight (Schedule 40).
 - 2. Pipe joints shall be threaded and coupled, open ends, no caps.
 - 3. Pipe intersections shall be made with cross grid connectors.
- B. Installation Accessories: Cable or threaded rod.

PART 3 EXECUTION

- A. Hang grid from structural members only. Do not support grid from metal deck.

END OF SECTION

SECTION 116615

BALLET BARS

PART 1 GENERAL

1.01 SUMMARY

- A. Qualitative requirements for wall mounted ballet bars.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wall Mounted Ballet Bars
 - 1. Single bar, either non-adjustable or adjustable.
 - 2. Double bar, non-adjustable.
- B. Oak Ballet Bars
 - 1. 1-3/4" inch diameter

PART 3 EXECUTION

3.01 MOUNTING

- A. Spacing for brackets
 - 1. General: 96 inch maximum span between brackets
 - a. Minimum overhang 2 inches.
 - b. Maximum overhang 20 inches.
- B. Bar heights
 - 1. Single Bar: 32 inches to 46 inches from floor.
 - 2. Double Bar: 32 inches to 34 inches from the floor for the lower bar, and 44 inches to 46 inches from the floor for the upper bar.
- C. Distance from wall to bar
 - 1. Inside at 7-1/2 inches.

EQUIPMENT

CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

SECTION 116800

PLAY FIELD EQUIPMENT AND STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

- A. Qualitative requirements for play field equipment and structures.

1.02 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer of playground equipment.
- B. Manufacturer's Qualifications: A firm who playground equipment components have been certified by IPEMA's "3rd Party Certification" service.
 - 1. Provide only playground equipment and play structure components bearing the IPEMA Certification Seal.
- C. Safety Standards: Provide playground equipment complying with or exceeding requirements in the following:
 - 1. CPSC No. 325, "Handbook for Public Playground Safety".
 - 2. Label play structures with warning label and manufacturer's identification per ASTM F 1487.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide units specifically designed for exterior exposure and intended use:
 - 1. Swing main frame
 - 2. Sand manipulating equipment
 - 3. Modular/Composite play structure
 - a. Play platform
 - b. Bridge component
 - c. Climbing component
 - d. Slide component
 - e. Crawl tube component
 - f. Overhead play component
 - g. ADA structure access components
 - h. Roof/canopy component

PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated on Shop Drawings.
- B.
 - 1. Maximum Equipment Height: Coordinated installed heights of equipment and components with installation of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that playground equipment elevations comply with requirements for each type and component of equipment.

END OF SECTION

SECTION **131900**

KENNELS & ANIMAL SHELTER EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** chain link animal shelter/kennel equipment.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Chain-Link Fence Fabric:
1. Mesh and Wire Size: 2 inch mesh, 0.148 inch diameter (9 gage).
 2. Coating: ASTM A 817, Type 2, Class 2, zinc-coated (galvanized).
- B. Framework:
1. Galvanized steel, ASTM F 1083.
- C. Gates:
1. Swinging & sliding type.
- D. Miscellaneous:
1. Isolation panels – stainless steel sheets 24 ga. (18-8 type 304-2B)
 2. Animal operated doors
 3. Automatic feeding system

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions and approved submittals. Comply with ASTM F 567. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Install posts to depth to avoid frost heave.
- B. Cut pipe with pipe-cutters only. Cuttings with backsaws is not acceptable. Tack weld gates for strength. Use spring loaded latches, not yokes.

END OF SECTION

SPECIAL CONSTRUCTION

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL)

SECTION **133413**

GLAZED STRUCTURES (GREENHOUSE)

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** greenhouse superstructure including all glazing, doors, door hardware, and ventilation.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide units specifically designed for intended use:
1. Superstructure
 2. Gutters and related drainage systems
 3. Wall and vent sills
 4. Glazing bars
 5. Operable roof and gable vents
 6. Vent operators and power actuators
 7. Doors and frames
 8. 8mm colorless polycarbonate glazing (U-value/R-value=0.62/1.61)
 9. Exhaust system and horizontal air flow fans
 10. Wet pad evaporative cooling system
 11. Heating system (maintain 70degF @ outside conditions of 9degF and 15mph wind)
 12. Ground cover fabric (17 mill, 3.2 oz polypropylene fabric)

PART 3 EXECUTION (**NOT USED**)

END OF SECTION

SECTION **133419**

METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. **Qualitative requirements for** pre-engineered metal buildings.
1. Structural framing
 2. Roofing and siding
 3. Doors, windows, vents, and louvers

1.02 QUALITY ASSURANCE

- A. **Manufacturer: AISC certified for Category MB.**

PART 2 PRODUCTS

2.01 MATERIALS

- A. Framing:
1. Structural Framing: Structural steel shapes, and primary, secondary, and endwall framing including columns, beams, purlins, girts, struts, and bracing.
- B. Siding Panels:
1. Type: Factory-assembled insulated panels for concealed fastening.
 2. Material: **Metallic**-coated steel sheets.
 3. Siding Panel Finish: **High-performance organic finish** (fluoropolymer)
- C. Roofing Panels:
1. Type: Factory-formed standing-seam roof panel system.
 2. Material: **Metallic**-coated steel sheets.
 3. Roofing Panel Finish: **High-performance organic finish** (fluoropolymer)
- D. Doors and Hardware:
1. Steel Doors and Frames: SDI-100 requirements.
 2. Hardware: ANSI A115 requirements.
- E. Windows:
1. Type: Operable, with insect screens.
 2. Material: Aluminum, mill finish.
 3. Material: Aluminum, anodized finish.
- F. Glazing:
1. Clear
 2. Translucent

SPECIAL CONSTRUCTION

CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

- G. Related Materials:
 - 1. Vapor barriers
 - 2. Gutters and downspouts
 - 3. Caulking and sealants
 - 4. Wall louvers
 - 5. Roof ventilators

PART 3 EXECUTION

3.01 INSTALLATION

- A. *Insulation: Over purlins with spacer blocks.***

END OF SECTION

CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL) HEATING, VENTILATING, and AIR-CONDITIONING

SECTION 233500

VEHICLE FUME EXHAUST EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Qualitative requirements for fume exhaust equipment for carbon monoxide vehicle exhaust and welding fume exhaust.

1.02 QUALITY ASSURANCE

- A. ***Design and installation shall be in accordance with 1) ANSI/AIHA Standard Z9.2 – 2006: American National Standard for Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems and 2) Industrial Ventilation: A Manual of Recommended Practice, 24th Edition, American Conference of Governmental Industrial Hygienists (ACGIH).*** Provide products of acceptable manufacturers which have been satisfactorily used in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Overhead Carbon Monoxide Vehicle Exhaust System
 1. Hanging overhead system with tubing sling and winch.
 2. Articulated arm: welded construction, structural tubular steel, with pivot assembly and swivel connection to ductwork. Provide adjustable stops at all pivoting members and flexible tubing drop with spring balancer and adapter.
 3. Power operated tubing storage reels with pendant-type remote control.
 4. Exhaust Fans: Belt-drive exhaust fans, 15,000+ cfm min., AMCA rated, statically and dynamically balanced.
 5. Furnish vibration isolations system of type to suit the fan(s).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper function. Clean and protect work from damage.

END OF SECTION

HEATING, VENTILATING, and AIR-CONDITIONING CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

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CHAPTER 9: SPECIFICATIONS (CAREER TECHNICAL) MATERIAL PROCESSING & HANDLING EQUIPMENT**SECTION 412223****HOISTS & CRANES****PART 1 GENERAL****1.01 SUMMARY**

- A. **Qualitative requirements for** electric chain hoist.

1.02 QUALITY ASSURANCE

- A. Safety Code: ASME/ANSI all applicable sections.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Provide electric chain hoist units specifically designed for intended use:
1. Capacity Range: ¼ thru 2 tons.
 2. Lift: 10 feet minimum.
 3. Lifting Speed: 5 to 64 FPM.
 4. Control: Push-button control.
 5. Suspension: Push trolley.
 6. Motor: High-torque, 30-minute rated with class "B" with a thermal actuated switch (TAS)
 7. Safety: Mechanical load brake and overload protection which prevents lifting loads beyond the hoists load range.
 8. Safety: Provide an upper and lower control circuit limit switch.

PART 3 EXECUTION (NOT USED)**END OF SECTION**

MATERIAL PROCESSING & HANDLING EQUIPMENT CHAPTER 9: SPECIFICATIONS (CAREER-TECHNICAL)

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