

CONSTRUCTION MASTER SPECIFICATION

SECTION 08361

OVERHEAD SECTIONAL STEEL DOORS

******* This guide section can be used for specifying insulated, exterior, overhead sectional steel doors for construction projects at SNL. The specifier will need to edit this section for a specific project to reflect the options and applications being used. The guide section has been written so that most editing can be accomplished by deleting unnecessary requirements and options. Depending on project requirements, some additional information will need to be added by the specifier. Options are indicated by []. Notes to assist the specifier in selecting options and editing the specification guide are printed in bold and indicated with *****. For final editing, all brackets and notes will need to be deleted from the guide, and this specification will need to be made into a Construction Special Specification.**

Throughout this product guide specification, references are made to other specification sections that might be contained in the project manual. These references are presented as examples and coordination reminders and will need to be edited for a specific project.

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PART 1 - GENERAL

1.01 SUMMARY

******* Edit the following to reflect required overhead sectional steel door assemblies. *******

- A. Section includes: [Manually operated,] [Electrically operated,] exterior, insulated, [glazed] overhead sectional steel doors.

******* List other specification sections dealing with work directly related to this section such as the following. *******

B. Related sections:

1. Section 05500, "Metal Fabrications": Steel angles, supports, and framing of overhead sectional door openings and auxiliary structural framing for suspending door tracks.
2. Section 09900, "Painting": Field painting of overhead sectional steel doors.
3. Section 16001, "Electrical Work": Electrical power supply and wiring devices for electrically operated sectional doors.

- C. See Door Schedule in Drawings for types, sizes, and configurations of overhead sectional doors.

1.02 REFERENCES

******* List by number and full title reference standards referred to in remainder of specification section. Delete non-applicable references. *******

A. American National Standards Institute (ANSI):

ANSI Z97.1 Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.

B. American Society of Testing and Materials (ASTM):

ASTM A366 Steel, Carbon, Cold Rolled Sheet, Commercial Quality.

ASTM A653/A653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

ASTM C578 Rigid, Cellular Polystyrene Thermal Insulation.

ASTM E2074 Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.

C. Code of Federal Regulations (CFR)

CFR 16-CFR 1201 Safety Standard for Architectural Glazing Materials.

D. Door and Access Systems Manufacturers Association (DASMA):

DASMA 105 Test Method for Thermal Transmittance and Air Infiltration of Garage Doors.

E. Factory Mutual (FM)

F. Green Seal (GS):

GS GC-03 Environmental Criteria for Anti-Corrosive Paints.

G. National Fire Protection Association (NFPA):

NFPA 80 Standard for Fire Doors, Fire Windows.

H. Steel Structures Painting Council (SSPC):

SSPC Paint 20 Zinc-Rich Coatings (Type I-Inorganic and Type II-Organic).

SSPC Paint 25 Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand
Cleaned Steel, Type I and Type II.

I. Underwriter's Laboratories (UL)

1.03 SUBMITTALS

A. Submit in accordance with Section 01330, "Submittal Procedures":

1. Product data for overhead sectional door assemblies and components. Each overhead sectional door assembly shall be obtained as a complete unit, produced by one manufacturer.
2. Function descriptions for electric operators.
3. Shop drawings indicating door assembly elevations, dimensions, track configuration, [wiring diagrams,] and details for fabrication, suspension and bracing of track, attachment, anchorage, and installation. Reflect actual Project conditions, adjacent components, and required clearances for adjustment.
4. Certificates Documenting:
 - a. Domestic Steel: Sectional steel doors are manufactured from United States produced steel as required by Paragraph [2.2.A] [_____].
 - b. Wind Load Resistance: Exterior units have been successfully tested for performance specified in Paragraph [2.3.D.1] [_____].
 - c. Air Infiltration: Exterior units have been successfully tested for performance specified in Paragraph [2.3.D.2] [_____].
 - d. R-Value: Exterior thermal units have been successfully tested for performance specified in Paragraph [2.3.F.5] [_____].
 - e. Ozone Depleting Substances (ODS): Door insulation does not contain ODS as required by Paragraph [2.2.B] [_____].
 - f. Primer Environmental Criteria: Primers comply with GS GC-03 as required by Paragraph [2.2.D] [_____].

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company currently manufacturing overhead sectional doors with 5 years minimum successful experience.
- B. Installer: Experienced in the installation of overhead sectional doors and approved by the door manufacturer.

- C. Fire-Rated Door Assemblies: Comply with NFPA 80, tested for fire-test-response characteristics per ASTM E2074, and are labeled and listed by UL or another nationally recognized testing laboratory.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Upon delivery, inspect units. Remove and replace damaged units.
- B. Storage: Store components under cover, off ground, and in manner to avoid damage or distortion. Protect from corrosion and deterioration.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

******* The following are acceptable manufacturers of overhead sectional steel doors. However, not all manufacturers provide all types and options of door assembly. Edit list to reflect manufacturers that offer specified options. *******

- A. Raynor Garage Doors; Dixon, Illinois; (www.raynor.com).
- B. Overhead Door Corporation; Dallas, Texas; (www.overheaddoor.com).
- C. Wayne-Dalton Corporation; Mount Hope, Ohio; (www.wayne-dalton.com).
- D. Windsor Door; Little Rock, Arkansas; (www.windsordoor.com).
- E. Manufacturers of equivalent products submitted and approved in accordance with Section 01330, "Submittal Procedures".

2.02 MATERIALS

- A. Steel: Manufactured in United States, in accordance with requirements of Quality Assurance article.
 - 1. Cold-Rolled Steel Sheet: Commercial quality, stretcher level for flatness complying with ASTM A366.
 - 2. Galvanized Steel Sheet: Comply with ASTM A653/A653M, Grade A, with minimum yield strength of 33,000 psi, and a minimum G90 Zinc-Coating.

******* Polyurethane foam insulation is not to be used as door panel insulation for SNL projects. *******

- B. Door Section Insulation: Fire-retardant, closed cell, expanded polystyrene complying with ASTM C578 and not containing ozone depleting substances (ODS), including CFC (Chlorofluorocarbon) or HCFC (Hydrochlorofluorocarbon) blowing agents. No CFC or HCFC-based insulating materials shall be furnished and installed under this contract.
- C. Galvanizing Repair Paint: Comply with SSPC Paint 20.
- D. Primer: Corrosion inhibiting, red oxide primer complying with SSPC Paint 25 and GS GC-03.
 - 1. Lead and cadmium free.
 - 2. VOC Concentration: 250 grams maximum per liter minus water and chemical component restrictions.

2.03 EXTERIOR INSULATED OVERHEAD SECTIONAL STEEL DOORS

- A. Type: [Manually operated,] [Electrically operated,] spring counterbalanced, insulated, weatherproofed, exterior, [glazed,] overhead sectional steel door furnished complete with tracks, hardware, fastenings, operating mechanism, weather seals, and accessories; Model No. [_____] as manufactured by [_____].
- B. Opening Sizes: [[_____] feet wide by [_____] feet high.] [As indicated on Drawings.]
- C. Configuration: [_____] sections high [with [_____] sections glazed with [_____] lights per section.] [As indicated on Drawings.]
- D. Performance Requirements:
 - 1. Wind Loading: Coiling exterior door assemblies shall withstand 25 PSF positive and negative wind loads without damage and permanent deformation.
 - 2. Maximum Air Infiltration: Air leakage shall not exceed 0.4 cubic feet per minute per square foot tested in accordance with DASMA 105.

******* Edit the following paragraph to reflect type of operation. Verify type of operation is suitable for door size. Refer to manufacturer's product literature for recommended operation and size limitations. In general, use the following guidelines for maximum door opening areas: *******

Manual push-up operation: 12 feet high maximum and 120 square feet maximum area.

Manual chain operation: 12 feet wide maximum and 168 square feet maximum.

Motorized operation: As recommended by manufacturer for type of motor operator.

- E. Operation: [Manual push-up operation requiring 25 pounds maximum effort to open and close. Provide with lift handles on bottom section and pole with hook.] [Manual chain operated with endless chain and requiring 35 pounds maximum effort to open and close.] [Electric, motorized operation.]
- F. Door Sections: Sandwich panel fabricated with roll folded galvanized steel sheet faces and polystyrene insulation.
 - 1. Nominal size: 24 inches high by 2 inches deep.
 - 2. Minimum exterior face thickness: 16-gauge.
 - 3. Minimum interior face thickness: 24-gauge.
 - 4. Horizontal meeting edges: Ship lap or keyed design with resilient weather seal to prevent air infiltration.
 - 5. Insulation: Expanded polystyrene with minimum R-Value of 6.
 - 6. Stiles: Enclose panel ends with 16-gauge channel-shaped stiles, welded in place. Provide intermediate stiles at 48 inches O.C. maximum, welded in place.
 - 7. Reinforcement: Reinforce door sections with galvanized steel members as required by door width and loading. Provide bottom section with continuous channel or angle conforming to bottom section profile.
- G. Hardware: Heavy-duty, galvanized steel components with galvanized, cadmium plated, or stainless steel fasteners. Attachments shall be reinforced with backup plates. Bolts shall be secured with lock nuts or lock washers.
 - 1. Hinges: Type, size and spacing as recommended by manufacturer for door size.
 - 2. Rollers: Heavy-duty rollers with steel ball bearings in case-hardened steel races and case-hardened steel wheels of diameter to fit track.
 - 3. Dead Bolt: Interior mounted, heavy-duty slide bolt to engage slot in track.
- H. Weather seals: Factory applied resilient material capable of replacement without removal of track, doors, or hardware.
 - 1. Head: Top seal at door head.

2. Jambs: Flap to press against door sections.
3. Bottom: Compressible astragal.
4. Section Joints: Continuous across door to seal joint between and provide thermal break.

2.04 GLAZING

******* Various types of factory-installed glazing can be provided for sectional door panels. Include this article if glazing is required. *******

- A. Factory install glazed lights in overhead sectional doors at locations indicated on Drawings. Comply with safety glazing requirements of ANSI Z97.1 and CFR 16-CFR 1201.

******* Various types and sizes of glazed lights are available for insertion in overhead sectional doors. Refer to manufacturers' product literature for options. *******

- B. Type: [Molded, high-impact polymer frame with [1/2 inch thick, clear, insulating, safety glass.] [1/4 inch thick, clear safety glass.] [1/4 inch thick [clear] [translucent] [acrylic] [polycarbonate] plastic glazing.] [_____].
- C. Nominal Size: [24 inches wide by 8 inches high] [_____].

2.05 TRACKS AND SUPPORTS

- A. Provide manufacturer's recommended track assembly designed to adequately accommodate door size and weight, clearances, and Project conditions. Include required brackets, bracing, and reinforcing for rigid, secure, functional installation without sag, sway, and vibration of assembly during door operation.

******* Edit the following to reflect type of track configuration. Refer to manufacturer's product literature for required dimensions and clearances. Coordinated with Drawings. *******

- B. Track Configuration: [Standard lift with [horizontal] [inclined track] extending directly above door opening.] [High lift with tracking continuing vertically above door opening before extending [horizontally] [at an incline].] [Vertical lift with track extending vertically above door opening.] [Low headroom with tracking extending horizontally directly above door opening and counterbalance assembly mounted [at rear] [in front] of track extension.] [As indicated on Drawings.]

- C. Fabricate track from galvanized steel sections using welded connections.
 - 1. Vertical track shall be angled to ensure tight closure at jambs when door is closed. Provide continuous angle for mounting vertical track to jambs.
 - 2. Provide slotted holes in vertical track sections at 2 inches to accommodate door drop safety device.
 - 3. Reinforce horizontal track sections with continuous angle to prevent deflection. Suspend horizontal track at ends and curves with laterally braced to supports attached to overhead structural framing.

2.06 COUNTERBALANCE ASSEMBLY

******* Spring counterbalanced assemblies are typically rated to provide 10,000 minimum use cycles. Long-life springs of 25,000, 50,000, and 100,000 cycles can be specified for high usage doors. Refer to manufacturer's product literature for available ratings and edit the following for Project requirements. *******

- A. Equip doors with assembly designed for counterbalanced lifting of sectional door of specified size and weight. Counterbalanced assembly shall be rated for [10,000] [25,000] [50,000] [100,000] use cycles.
 - 1. Type: Adjustable, torsion springs on continuous ball bearing cross header shaft and connected to door with lifting cables.
 - 2. Springs: Helical wound, oil-tempered spring wire with internal safety rods.
 - 3. Fittings and Drums: Die-cast, high strength aluminum. Drums grooved to receive cables. Provide quantity, size, and spacing of brackets as recommended by manufacture for door size and weight.
 - 4. Lifting Cable: Galvanized aircraft type with 5 to 1 minimum safety factor.
- B. Door Drop Safety Device: Spring-loaded steel or bronze cam device mounted to bottom roller assembly on each side of door section. Device to automatically engage track slots and stop door if either cable breaks.
- C. Totalizer: Equip assembly with device to record number of open and close cycles.

2.07 MANUAL OPERATORS

******* For push-up doors up to 12' high or 120 S.F. maximum, or lightweight doors, except as otherwise indicated. *******

- A. Push-Up: Provide lift handles and pull rope for raising and lowering doors, operating with not more than 25 lbs. lift or pull.
- B. Chain Hoist
 - 1. Provide direct drive chain hoist for doors not exceeding 12' wide or 168 S.F. (unless otherwise indicated); side-mounted unit consisting of an endless steel hand chain, cast-iron pocket pulley and chain guard, mounted on counterbalance shaft and operating with not more than 35 lbs. pull.
 - 2. Provide reduction drive chain hoist for doors not over 22' wide or 308 S.F. and high lift doors, unless otherwise indicated; side-mounted unit consisting of an endless steel hand chain, chain pocket wheel and reduction unit of at least 3 to 1, roller chain and sprocket drive, end-mounted on counterbalance shaft and operating with not more than 35 lbs. pull.
 - 3. Provide trolley-mounted reduction drive chain hoist for doors over 15' high and when door area exceeds 195 S.F., unless otherwise indicated; consisting of an endless steel hand chain, chain pocket wheel and guard, reduction unit of at least 3 to 1, driving through separate drive shaft to center trolley track. Connect to door through secondary drive roller chain and sprocket and operate at not more than 35 lbs. pull.

2.08 ELECTRIC OPERATOR

******* Include this article if electric operated sectional doors are required. *******

- A. Electric motor operator with pre-wired motor controls, built-in safety system, reversing magnetic controller, overload protection, electric brake, remote control station, and limit switches.
- B. Motor: Provide 208 volt AC, 3-phase, constant duty, instant reversing, high-starting torque with automatic reset and thermal overload protection, Class A insulated electric motor. Unit shall be self-locking and capable of holding door in any position in case of counterbalance spring failure. Sized motor to move door in either direction from any position at 8 inches minimum per second and 12 inches maximum per second.
- C. Limit Switches: Adjustable rotary type synchronized with door.
- D. Clutch: Adjustable disc type.
- E. Brake: Solenoid actuated drum type.

- F. Control Station: Momentary-contact, 3-button station with open, close, and stop functions.
 - 1. Interior Installations: NEMA Type 1 surface mounted enclosure, full guarded and heavy-duty.
 - 2. Exterior Installation: NEMA Type 4, weatherproof, surface mounted enclosure, full guarded, standard duty and key-operated.
- G. Magnetic Starter: Provide a reversing, across-the-line type magnetic starter with three integral overload relays to open the control circuit when any one of the three overload relays open on excessive motor current.
 - 1. These overload relays shall be located in the reversing motor starter housing and shall be manufactured by the starter manufacturer.
- H. Manual Override: In case of power failure, provide auxiliary hand chain operator interlocked to disconnect motor, prevent motor operating, and release break.
- I. Safety Device: Provide electric sensing edge on bottom bar to sense object in path of door and activate switch that reverses door's downward travel.
- J. Control Transformer: Provide a control transformer, if required, to obtain a 120-volt AC control voltage, unless otherwise noted on the drawings.
 - 1. The transformer shall have the neutral side solidly grounded to the housing around the starter.

2.09 ACCESSORIES

- A. Bumpers: Provide compression or leaf spring bumpers at each end of horizontal track to cushion door at end of opening operation.
- B. Fasteners and Anchors: Heavy-duty, galvanized or stainless steel of type, size, and spacing as recommended by door manufacturer for secure, rigid, functional installation.
- C. Locking Devices:
 - 1. Push-up Doors: Interior slide bolts suitable for padlocks.
 - 2. Chain Operated Doors: Chain keepers suitable for padlocks.

******* In order to prevent potential damage to electric motor operators, electrically operated sectional doors should not be equipped with padlocks or other type of mechanical lock. If dead bolts are used in conjunction with motor operators, specify deadbolt interlock. *******

3. Electrically Operated Doors: Solenoid operated brake. [For deadbolts provide interlock limit switch to remove control power from open button of control station when dead bolt is engaged.]

2.10 FACTORY APPLIED FINISHES

- A. Factory prime galvanized and ferrous metal surfaces:
 1. Preparation: Clean with non-petroleum solvent to remove oil, dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas. Apply galvanizing repair paint to galvanized components.
 2. Pretreat with conversion coating compatible with primer.
 3. Primer: Apply primer to prepare units for site applied paint finish.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Examination: Prior to fabrication or submittal of shop drawings, field verify size of openings and clearances. Determine installation conditions and requirements.
- B. Coordinate provision of overhead sectional doors to ensure adequate structural support is provided for suspension of door and tracks.

******* Include the following paragraph if electrical operators are specified. *******

- C. Coordinate provision of overhead sectional doors to ensure proper power supply is provided for electric operators.
- D. Furnish built-in anchors and inserts in timely manner to avoid delays.

3.02 INSTALLATION

- A. Install overhead door assemblies in prepared openings in accordance with approved shop drawings and manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.

- D. Doors shall be lubricated and properly adjusted to manufacturer's specifications to operate freely. Completed doors shall be free from warp, twist, and distortion.
- E. Remove labels, visible markings, and clean assemblies.

3.03 FIELD QUALITY CONTROL

- A. Testing: After installation, operate doors completely open, closed, and locked a minimum of three times. Ensure perimeter is weathertight. Correct deficiencies, adjust, and re-test.
- B. Remove labels, visible markings, and clean assemblies.

END OF SECTION