

SECTION 05512

CAGED ALUMINUM ACCESS LADDERS

******* UPNO VR, Inc. manufactures several types of aluminum access ladders. This guide specification section can be used to specify fixed, wall mounted, vertical access ladders with integral safety cages. Ladders over 20 feet high are required to have safety cages. Vertical ladders less than 20 feet high can be specified in SECTION 05511 - FIXED ALUMINUM ACCESS LADDERS. Ship ladders can be specified in SECTION 05513 - ALUMINUM INCLINED LADDERS.**

PART 1 - GENERAL

1.1 SUMMARY

******* UPNO VR, Inc. manufactures five models of caged aluminum access ladders. Select required type in the following paragraph and delete nonapplicable types. *******

- A. Section includes: Fixed, wall mounted, vertical, aluminum, [roof hatch rail extension ladder with integral safety cage.] [roof over rail extension ladder with integral safety cage.] [return to rear of parapet ladder with integral safety cage.] [ladder with platform, return to rear of parapet, and integral safety cage.] [ladder with intermediate platforms, roof over rail, and integral safety cage.]
- B. Related sections:

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

- 1. Section 06100 - Rough Carpentry: Blocking in metal stud walls and partitions for anchorage of access ladders.
- 2. Section 07725 - Roof Hatch: Manufactured roof hatch to be accessed by aluminum ladder.

******* Safety post extensions are often used in conjunction with roof hatch access ladders. They can be provided separately or with ladder. *******

- 3. Section 07726 - Ladder Safety Post Extension: Manufactured safety post extension to be attached to roof access ladder.

1.2 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):
 - 1. ANSI A14.3 - Ladders, Fixed, Safety Requirements.
- B. American Society for Testing and Materials (ASTM) Publications:
 - 1. ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
 - 2. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

1.3 SUBMITTALS

- A. Provide in accordance with Section 01330 - Submittal Procedures:
 - 1. Product data for access ladders and accessories.
 - 2. Shop drawings showing elevations, dimensions, safety cage, connections, size and type of fasteners, and fabrication and installation details.
 - 3. Installation and maintenance instructions.

1.4 QUALITY ASSURANCE

- A. Access ladders shall be designed and installed to comply with ANSI A14.3.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. UPNO VR, Inc., 3 Crane Way, Hooksett, New Hampshire 03106; 603-625-8639.
- B. Manufacturers of equivalent products submitted and approved in accordance with Section 01630 - Product Substitution Procedures.

2.2 MATERIALS

- A. Extruded aluminum: ASTM B221, Alloy 6063 Temper T-6, non-spark.
- B. Sheet aluminum: ASTM B209 6063 Temper T-6.

******* Standard access ladder finish is mill finished aluminum. Electrostatically applied, powder paint color coatings can be provided as a special order. Contact UPNOVR, Inc. for information and assistance in specifying this special finish. *******

- C. Finish: Mill finished aluminum.

2.3 GENERAL FABRICATION

- A. Field verify ladder dimensions prior to fabrication.
- B. Fabricate to designs indicated on Drawings and to meet performance requirements specified in Paragraph 1.4.
- C. Components shall be welded. Ladder shall not require field assembly.

2.4 VERTICAL CAGED ACCESS LADDER

******* UPNO VR, Inc. manufacturers 6 models of fixed, wall mounted, vertical access ladders with integral safety cages. Select required type from the following options and delete non-applicable options. *******

- A. Type: Fixed, wall mounted, vertical, caged, aluminum, [roof hatch rail extension ladder; Model No. U-300] [roof over rail extension ladder; Model No. U- 301] [return to rear of parapet ladder; Model No. U-302] [ladder with platform and return to rear of parapet; Model No. U-303] [ladder with intermediate platforms and roof over rail; Model No. U-390] as manufactured by UPNO VR, Inc.

******* Include the following paragraphs to specify caged roof hatch rail extension ladder; Model No. U-300. This model is used for heights from 20 to 30 feet maximum and is mounted with side rails 3 inches above finish floor. *******

- B. Nominal height: [[_____] feet.] [As indicated on Drawings.]
- C. Side rails: 1-3/4 inches by 3 inches tubes with 1/8 inch wall thickness.

******* Preferred width for caged access ladders is 24 inches. 18 inches wide caged ladders are also available. Select 18 or 24 inches long rungs to accommodate required ladder width. *******

- D. Rungs: 1-1/4 wide by 1-1/4 inches tube by [18] [24] inches long with corrugated surfaces and capable of 1,000 pounds load. Space 12 inches on center. Attach rungs in centerline of side rails by welding.

******* Include the following paragraphs to specify caged roof over rail extension ladder; Model No. U-301. This model is used for heights from 20 to 30 feet maximum and is mounted with side rails 3 inches above finish floor. *******

- B. Nominal height: [[_____] feet.] [As indicated on Drawings.]
- C. Side rails: 1-3/4 inches by 3 inches tubes with 1/8 inch wall thickness. Extend rails 42 inches above [roof line.] [parapet.]
- D. Extension: At top of side rails provide 19 inches extension, 28 inches high,

constructed from 1-1/4 inches square tube grab bars with corrugated surfaces.

******* Preferred width for caged access ladders is 24 inches. 18 inches wide caged ladders are also available. Select 18 or 24 inches long rungs to accommodate required ladder width. *******

- E. Rungs: 1-1/4 inches square tube by [18] [24] inches long with corrugated surfaces and capable of 1,000 pounds load. Space 12 inches on center. Attach rungs in centerline of side rails by welding.

******* Include the following paragraphs to specify caged return to rear of parapet ladder; Model No. U-302. This model is used for heights from 20 to 30 feet maximum and is mounted with side rails 3 inches above finish floor. *******

- B. Nominal height: [[_____] feet.] [As indicated on Drawings.]

******* Cross over span will be determined by width of parapet wall. *******

- C. Cross over span: [[_____] inches.] [As indicated on Drawings.]

- D. Side rails: 1-3/4 inches by 3 inches tubes with 1/8 inch wall thickness. Extend rails 42 inches above parapet. Provide rails on opposite side mounted to rear of parapet and extending 42 inches above parapet and below parapet to roof line.

- E. Grab bars: Connect front and rear side rails with 4 pairs of 1-1/4 inches square tube grab bars with corrugated surfaces.

******* Preferred width for caged access ladders is 24 inches. 18 inches wide caged ladders are also available. Select 18 or 24 inches long rungs to accommodate required ladder width. *******

- F. Rungs: 1-1/4 inches square tube by [18] [24] inches long with corrugated surfaces and capable of 1,000 pounds load. Space 12 inches on center. Attach rungs in centerline of side rails by welding.

******* Include the following paragraphs to specify caged ladder with platform and return to rear of parapet; Model No. U-303. This model is used for heights from 20 to 30 feet maximum is mounted with side rails 3 inches above finish floor. *******

- B. Nominal height: [[_____] feet.] [As indicated on Drawings.]

******* Cross over span will be determined by width of parapet wall. *******

- C. Cross over span: [[_____] inches.] [As indicated on Drawings.]

- D. Side rails: 1-3/4 inches by 3 inches tubes with 1/8 inch wall thickness. Extend rails 42 inches above parapet. Provide rails on opposite side mounted to rear of parapet

and extending 42 inches above parapet and below parapet to roof line.

- E. Grab bars: Connect front and rear side rails with 4 pairs of 1-1/4 inches square tube grab bars with corrugated surfaces.
- F. Platform: Provide cross over platform fabricated from 6 inches wide by 1-3/4 inches deep aluminum treads with corrugated surface.

******* Preferred width for caged access ladders is 24 inches. 18 inches wide caged ladders are also available. Select 18 or 24 inches long rungs to accommodate required ladder width. *******

- G. Rungs: 1-1/4 inches square tube by [18] [24] inches long with corrugated surfaces and capable of 1,000 pounds load. Space 12 inches on center. Attach rungs in centerline of side rails by welding.

******* Include the following paragraphs to specify caged roof over rail extension ladder with intermediate platforms; Model No. U-390. This model is used for heights over 30 feet is mounted with side rails 3 inches above finish floor. *******

- B. Configuration: Ladder shall be configured with [2] [_____] caged vertical ladder segments offset from each other and connected with intermediate platform with guardrail as indicated on Drawings. Nominal heights of ladder segments:
 - 1. Lower segment: [_____] feet.
 - 2. Upper segment: [_____] feet.
- C. Side rails: 1-3/4 inches by 3 inches tubes with 1/8 inch wall thickness. Extend rails of upper ladder segment 42 inches above [roof line.] [parapet.]
- D. Extension: At top of upper segment side rails provide 19 inches extension, 28 inches high. Construct from 1-1/4 inches square tube grab bars with corrugated surfaces.

******* Preferred width for caged access ladders is 24 inches. 18 inches wide caged ladders are also available. Select 18 or 24 inches long rungs to accommodate required ladder width. *******

- E. Rungs: 1-1/4 inches square tube by [18] [24] inches long with corrugated surfaces and capable of 1,000 pounds load. Space 12 inches on center. Attach rungs in centerline of side rails by welding.
- F. Intermediate platform: Provide intermediate cross over platform fabricated from 6 inches wide by 1-3/4 inches deep aluminum treads with corrugated surface.
- G. Guardrail: At intermediate platform provide guardrail constructed from 1-1/4 inches square tube grab bars with corrugated surfaces. Guardrail shall be 42 inches high

and connect side rails of 2 ladder segments as detailed on Drawings and reviewed shop drawings.

2.5 SAFETY CAGE

- A. Equip ladders with safety cages as detailed on Drawings and reviewed shop drawings.
- B. Fabricate from 2 inches wide by 1/4 inch thick aluminum vertical strips and horizontal loops welded to form cage around ladder.
 - 1. Bottom loop radius: 17-1/2 inches.
 - 2. Radius of other loops: 13-1/2 inches.
 - 3. Provide 7 vertical strips equally spaced around perimeter of cage.
 - 4. Space horizontal loops at 48 inches maximum.
- C. Minimum clearance from ladder to back of cage: 27 inches.
- D. Start cage [7] [8] [_____] feet above [grade] [intermediate platform] [roof level].
- E. Extend safety cage 42 inches minimum above top rung and attach to side rails as detailed on Drawings and reviewed shop drawings.

2.6 ACCESSORIES

- A. Support brackets:
 - 1. Wall brackets: Support ladder at top and bottom and at 48 inches maximum intermediate points with 2 by 1/4 inch minimum flat bar aluminum wall brackets. Allow 7 inches minimum clearance from wall to center line of rungs.

******* As an option, a hinged security door can be provided to cover bottom ladder rungs and prevent unauthorized roof access. Include the following paragraph for this option. *******

- B. Security door: Provide hinged security door to cover bottom rungs and prevent unauthorized roof access.
 - 1. Construction: Fabricate from 11 gage flat aluminum sheet covering front of ladder. Provide side flanges extending toward wall and meeting aluminum flange mounted to wall.
 - 2. Equip door with continuous stainless steel hinge and padlock hasp.

******* Safety post extension can be provided in conjunction with roof hatch and specified in other sections. As a option, safety post extension can be provided by UPNO VR, Inc. with access ladder. Include the following paragraph to specify this option. *******

- C. Safety post extension: Post extension for fixed ladders constructed of tubular aluminum sections with adjustable mounting brackets for attachment to top of ladder.
 - 1. Operation: Upward and downward movement controlled by spring balancing mechanism activated by release rod. Automatically locks when fully extended.
 - 2. Permanently mount operating instructions on safety post to be plainly visible to ladder users.

******* Fall arrest system can be provided in lieu of safety cage and specified in other sections. As a option, a fall arrest system can be provided by UPNOVR, Inc. with access ladder. Include the following paragraph to specify this option. *******

- D. Safety post extension: Post extension for fixed ladders constructed of tubular aluminum sections with adjustable mounting brackets for attachment to top of ladder.
 - 1. Operation: Upward and downward movement controlled by spring balancing mechanism activated by release rod. Automatically locks when fully extended.
 - 2. Permanently mount operating instructions on safety post to be plainly visible to ladder users.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to fabrication, field verify required dimensions.
- B. Coordinate provision of access ladder with provision of roof hatch specified in Section 07725 - Roof Hatch to ensure height and position of ladder is compatible with roof hatch curb.
- C. Coordinate ladder installation with construction of [CMU walls specified in Section 04220 - Concrete Unit Masonry to ensure block walls are adequately reinforced and cells grouted] [metal stud walls specified in Section 05400 - Cold Formed Metal Framing to ensure adequate support and blocking] [stud partitions specified in Section 09260 - Gypsum Board Assemblies to ensure adequate support and blocking] for attachment of brackets and support of ladder.

- D. Insulate dissimilar metals to prevent electrolysis with bituminous paint or non-absorptive isolation pad to prevent contact.

3.2 INSTALLATION

- A. Install ladder and safety cage in accordance with manufacturer's instructions and reviewed shop drawings.
- B. Position ladder such that side rails end 3 inches above floor and center of rungs are 7 inches from wall.
- C. Securely anchor support brackets with fasteners of type and size recommended by manufacturer. Place wall brackets at top and bottom of ladder. Place intermediate wall brackets at 48 inches maximum.
- D. Ensure ladder and safety cage are vertical, plumb, [aligned with center of roof hatch,] and rigid.

******* Include the following paragraph if security door is required. *******

- E. Install security door assembly and adjust for smooth operation.

******* Include the following paragraph if safety post extension is required. *******

- F. Safety post extension: Attach to top 2 rungs of ladder and centered between side rails. Adjust post to extend 42 inches above top rung when roof hatch is open and post is fully extended.
- G. After installation inspect ladder to verify proper, secure, and safe installation.
- H. Clean ladder using clean water and mild detergent. Do not use abrasive agent, steel wool, or harsh chemicals. Rinse with clean water.

END OF SECTION