

Rockwerx USA Gym Rock Climbing Walls

Rockwerx' GymRock Wall System is the best in the climbing wall industry, providing more flexible route setting options, unmatched durability, and a great looking, superior climbing surface. GymRock walls use mesh seaming and texture process to create a more fluid, unified look and feel emulating natural rock surfaces. GymRock curved climbing surfaces are formed by geometrically shaped steel panels fabricated and installed much like a 3D jigsaw puzzle. These panels are placed on a steel superstructure independently engineered for each project. Each panel section connects to the adjacent section unify the climbing wall design. Simple triangles, rectangles, and trapezoidal shapes are transformed into dramatic arches, caves, arêtes, dihedrals, spires, cracks and stalactites. GymRock's substantive concrete texture forms rounded edges and an aesthetically pleasing seamless design. The basis of a GymRock Wall System is the free-standing and self-supporting steel frame consisting of custom designed square tube and angle steel components. This framing system allows the climbing wall to take on almost any shape, at any angle, at any height. GymRock wall panels are supported every two feet. The inter-bracing strengthens the overall structure, and adds to the rock-solid feel of the wall, reducing flexing and climbing surface cracking. The structural grade plywood sheathing that serves as a base for the cement surfacing material also reduces wall flex and provides a superior anchor for Rockwerx' high performance X-Nut modular hold anchors. Rockwerx climbing wall designers work with architects to detail and customize artificial climbing wall features through our turnkey 3-D design services, creating both virtual and physical models of proposed installations. Rockwerx brings over 15 years of combined wall building experience and over 1500 completed walls in various facility types. The designs and engineering methods have stood the test of time, maintaining a reputation for revolutionary and reliable builds. Our projects range from some of the largest competition climbing venues in the world to recreational or multi-use facility climbing walls, and to unique climbing adventures in residential backyards. Rockwerx provides complete design, engineering, fabrication, and installation services to help customers create next generation climbing walls. The post-construction services offered include; staff and operational trainings and comprehensive route setting packages, along with continuing consulting for climbing wall operators.

SECTION 131200 – CLIMBING WALLS

GENERAL

1.1 Summary

Work included – Provide seamless textured substrate, panel-formed interior climbing wall system with internal structural support system, including design, engineering, fabrication, and installation based upon schematic system design indicated.

Design Parameters – All bids will provide square footage estimates for the following space requirements

Top rope wall: 20' w x 20' h

Bouldering Wall: 20' w x 12' h

1.2 RELATED REQUIREMENTS

Section 01 10 00 "Summary" for loose climbing equipment provided by Owner.

Section 01 12 00 "Allowances" for description of Work in this Section affected by allowances.

Section 32 18 16 "Playground Protective Surfacing" for protective surfacing materials located at base of artificial climbing walls.

1.3 DEFINITIONS

Artificial Climbing Wall: Sports equipment exclusively designed and originally built for climbing. Artificial climbing walls may be designed and used for lead climbing, top rope climbing, and bouldering.

Seamless textured substrate: The finished surface of the described climbing wall system. The surface is a hand troweled two-coat cementitious surface that is applied over an expanded metal lath substrate which is mechanically attached to a plywood surface. The plywood surface is mechanically attached to a metal frame that is anchored to a custom steel structure.

Route: Climbable surface approximately five feet wide that extends vertically from the base of the wall. The number of potential routes on a climbing wall is normally determined by the width of the wall at a height of five feet from its base.

Anchor Point: Used to belay climbers during their ascent or to lower them during their descent.

Top Rope Climbing: A style of climbing where the climber is safeguarded by a rope that passes through a belay anchor at the top of the climb. The climber always remains below the anchor as they climb.

Lead Climbing: A style of climbing where the climber is safeguarded by a rope that is passed through an anchor point as the climber progresses up the artificial climbing wall. The climber must clip the rope into each anchor point as they progress up the artificial climbing wall so that they are

Safeguarded from ground falls while ascending to the final anchor points at the top. Typically lead climbing anchor points are placed at spacing of 4 feet vertically to prevent a long fall.

Top Rope Belay Anchor: Located just above the top of the wall, this anchor system consists of two fixed ring type anchors or a welded bar mounted to a plate extending 4 to 6 inches out from the face of the climbing surface. Climbing rope is secured by running through both rings or around the bar one and a half times.

Rappel Station: Usually placed part way up a taller artificial climbing wall or at a ledge used for teaching or rappelling. Used to stop and belay a partner up so that they continue climbing from that point. A belay station usually consists of at least two distinct anchor points, linked by a chain (or webbing) in a "V" with a ring (or locking carabiner) in its interior part.

Automatic Belay: The Automatic Belay is a mechanical controlled descent device designed specifically for the climbing wall and climbing gym industry. The Auto Belay provides a hands free belay for the climber, thereby eliminating the need for an additional climber or attendant to serve as belayer. As the climber ascends, the slack rope or cable is pulled taut. Once at the top, or whenever the climber lets go of the wall, the device gently lowers them to the ground.

Climbing Volume: Large geometric shapes that bolt to climbing wall to create removable macro features. Volumes are friction coated to allow climbers to utilize the feature without holds, or handholds can bolt directly to the shape using incorporated t-nuts.

1.4 REFERENCE STANDARDS

American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):

1. ASCE/SEI 7: Minimum Design Loads for Buildings and Other Structures.

American Welding Society (AWS):

2. AWS D1.1/D1/1M – Structural Welding Code – Steel.

ASTM International (ASTM):

3. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
4. ASTM A 153/A 153M - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A 500 - Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
6. ASTM A 513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E 662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.

Climbing Wall Association (CWA):

ROCKWERX Gym Rock

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9. General Specification for Design and Engineering of Artificial Climbing Structures.
10. Specification for the Structural Inspection of Artificial Climbing Structures.

U.S. Department of Commerce, National Institute of Standards and Technology (NIST):

11. DOC PS-1 – Construction and Industrial Plywood.

1.5 ADMINISTRATIVE REQUIREMENTS

Coordination: Coordinate artificial climbing walls with related Work specified in other Sections.

1.6 ACTION SUBMITTALS

Product Data: For each type of artificial climbing wall product, including anchors, fasteners, and other hardware.

Shop Drawings:

1. Include three-dimensional model, plans, elevations, sections, and attachment details.
2. Include details of climbing wall surface panels including the following:
 - a. Wall surface climbing features as per the 3d climbing wall design model.
 - b. Belay anchor system components and locations as per the 3d climbing wall design model.
 - c. Access hatch location.
 - d. Rappel ledge as per the 3d climbing wall design model, if applicable.
3. Indicate dimensions, methods of field assembly, and components.
4. Detail fabrication and assembly of concealed structure, including sizes, dimensions, locations, and connections for structural members, base plates, and bracing.
5. Extent of surface systems and use zones for artificial climbing walls.
6. Indicate dead loads, superimposed loads, and live loads for artificial climbing walls.
7. Demonstrate compliance with artificial climbing wall design standard.

Samples: Submit one sample of climbing wall sample with specified surface. Sample size must be minimum 12" x 12" showing substrate, handhold fastener, sample color, and finish texture.

1.7 INFORMATIONAL SUBMITTALS

Qualification Statements: For manufacturer and installer.

Welding certificates.

Sample warranty.

1.8 CLOSEOUT SUBMITTALS

Maintenance data for artificial climbing walls.

1.9 QUALITY ASSURANCE

Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum 10 years experience in the manufacture and assembly of artificial climbing walls used in similar applications. Manufacturers seeking approval must submit the following in accordance with Instructions to Bidders and Division 01 General Requirements:

1. Product data, including descriptive information and test data from qualified independent testing agency indicating compliance with requirements.
2. Samples of each product specified.
3. List of successful installations of similar products available for evaluation by Architect.

U.S. owned and based manufacturer shall have a minimum of 10 years experience with the manufacturing and installation of the climbing wall system specified herein. Installers shall have 10 years experience installing the specified product.

Professional Engineer's Qualifications: licensed structural engineer in the state of specified construction.

Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel."

1.10 PRODUCT STORAGE AND HANDLING

Provide wall panels, frames, and related materials properly packaged and protected during shipping, handling, and storage to prevent damage.

Store materials indoors under cover on raised platforms, fully protected from dirt and moisture.

1.11 WARRANTY

Manufacturer's Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace components of artificial climbing walls that fail in materials or workmanship within specified warranty period.

1. Failure includes delamination or excessive surface cracking, wear of artificial climbing wall finish.
2. Warranty Period: 5 years from date of Substantial Completion.

PRODUCTS

2.1 MANUFACTURERS

Basis-of-Design Product: Subject to compliance with requirements, provide Gym Rock Wall System by Rockwerx, Barre MA, (978) 355-6400, www.rockwerxclimbing.com.

2.2 PERFORMANCE AND DESIGN CRITERIA

Delegated Design: Design artificial climbing walls, including comprehensive engineering analysis of structural framework, supports, and connections by a qualified professional engineer, using performance requirements and design criteria indicated.

Structural Performance: Artificial climbing walls shall withstand the effects of gravity loads, wind loads, and live loads determined according to ASCE/SEI 7 and requirements of authorities having jurisdiction.

Seismic Performance: Artificial climbing walls shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and requirements indicated.

Design Standard: Design artificial climbing walls in compliance with CWA Standards and requirements of authorities having jurisdiction.

2.3 ARTIFICIAL CLIMBING WALLS

Artificial Climbing Walls, General: Seamless, climbing wall consisting of 3/8" minimum thickness cement surfacing applied to expanded galvanized metal lath and plywood-covered steel panels supported by steel substructure. Climbing wall shall match the approved 3d climbing wall design model developed in collaboration with Owner and Architect, and be erected as permanent site installation.

Climbing Wall Surface: Through-colored cement surfacing trowel applied and sculpted to emulate natural granite in appearance and climbing friction, formed to provide a seamless, climbing wall system.

1. Color: Natural stone colors consisting of base color, accent colors and tints emulating natural rock appearance.

Belay Anchor System: Place belay anchor system components in locations and number indicated in the 3d climbing wall design model:

2. Automatic Belay: Quantity (5) - 28 foot (12.5 m) descent capacity, fall-safe design with self-regulating, non-wearing magnetic braking mechanism, self-adjusting for user weight, with webbing suspension, equipped with internal automatic backup braking [and wall mounting bracket and hardware]. [PerfectDescentAutoBelay](#).
3. Top Rope Belay Bars: Quantity (5). 3 inch diameter steel belay bar, configured to prevent rope jump, with wall mounting plate and hardware. Rockwerx, Top Rope Bar.
4. Lead Anchors: Client must specify desired quantity or indicate "none":

- a. Lead Bolts: Quantity (None). Grade VIII, formed from zinc plated steel, 3/8 inch diameter threads, with matching nut and lock washer. [FixeHardware](#).
- b. Bolt Hangers: Quantity (None). Accommodate two carabiners, formed to prevent spinning; 4-mm-thick zinc plated steel, 40 kN capacity; 4 mm hole; located as indicated on approved 3d climbing wall design model. [FixeHardware.#038](#).
- c. Top Anchors: Quantity (None). Designed for installation in pairs at top of climbing route, 11 kN rating, zinc plated steel, 3/8 inch (mm); [FixeHardware.Super Shut#166](#).

Access Hatches: Construct access hatches from material matching climbing wall components, capable of supporting weight of functional climbing including attachment of modular holds. Provide complete access to each climbing wall utilizing lockable, hinged access hatches located to coordinate with design of supporting structure.

Rappel Ledge: Quantity (None): Provide functional rappel ledge and belay ledge designed for teaching purposes at location indicated. Finish outer ledge with smooth texture.

Top of Bouldering Wall: Quantity (None): Construct and finish to match climbing wall, free of climbing features and modular holds.

Modular Hold Anchors: T-nut-type threaded sleeves, 3/8 by 1 inch (9.5 by 25 mm) No. 16 zinc plated steel, designed for hydraulic press installation into climbing wall surface, at 2.0 placements per square foot for top rope wall and minimum 3.0 placements per square foot for bouldering walls. Rockwerx, "X-Nuts" are basis of design.

Climbing Equipment: Client must specify desired quantity or indicate "none".

- A. Climbing Ropes: Dynamic ropes, 1 per climbing lane in sufficient length for wall height.
 - a. Product: Standard with the climbing wall manufacturer.
 - b. Manufacturer: [Petzl "Java"](#), or equal that meets UIAA standards.
- B. Climbing Harnesses: As indicated, or if not indicated, 2 harnesses per climbing lane.
 - a. Adjustable with double pass through buckles and gear loops.
 - b. Manufacturer: [Petzl "gym harness"](#), or equal that meets UIAA standards
- C. Locking Carabiners:
 - a. Aluminum, large D ring, 25Kn major axis, 7Kn minor axis, manual locking, as manufactured by [Petzl William "Ball Lock" carabiners](#) (Manual snap).
- D. Modular Handholds
 - a. Composed of polyurethane to minimize breakage.
 - i. Acceptable Manufacturers: [Element Climbing](#) or [Enix handholds](#).
 - b. Handhold selection shall be made based on strong functionality of the potential user base and shall include:
 - i. Large Holds
 - ii. Medium Holds
 - iii. Small Holds
 - c. To include handhold bolt of appropriate length for each handhold.

- E. Climbing Volumes: Quantity (8)
 - a. Plywood construction
 - b. Bolt on with integrated set screw placement
 - c. Friction coating for use without handholds
 - d. Minimum t-nut density of 3 per square foot

- F. Rental Shoes: (If applicable)
 - a. All purpose climbing shoes of size range to include most popular size for users.
 - b. Manufacturer: [Mad Rock](#)

- G. Auto Belay System
 - a. Auto belay Systems – Perfect Descent Climbing Systems

- H. Fall Attenuation Surface: Supplied by owner

2.4 CLIMBING WALL FABRICATION

Fabrication, General: Fabricate artificial climbing wall components for field assembly. Use connections that maintain structural value of joined pieces.

Structural Supports: Fabricate structural supports with cross-section profile and dimensions indicated on approved Shop Drawings.

1. Fabricate frame members, bracing, and connections from steel materials specified.
 - a. Comply with AWS recommended practices for shop welding.

2.5 EXAMINATION

Verification of Conditions: Examine areas where artificial climbing walls are to be installed, with Installer present. Verify compliance with requirements for installation tolerances and other conditions affecting installation and performance.

1. Verify conditions meet requirements for tolerances and other requirements of manufacturer.
2. Correct unsatisfactory conditions prior to proceeding with installation.

2.6 ERECTION OF ARTIFICIAL CLIMBING WALLS

General: Comply with manufacturer's written instructions and approved Shop Drawings. Support, anchor, and fasten components securely using anchors and fasteners indicated and recommended by manufacturer for application.

1. Comply with requirements of artificial climbing wall design standard.

Erection of Structural Supports: Erect structural supports in accordance with approved submittals. Anchor using fasteners indicated. Utilize structural components furnished by manufacturer; do not modify components in field without manufacturer approval.

2. Comply with AWS recommended practices for field welding.

Plywood Sheathing: Fasten to supports with manufacturer's recommended fasteners.

Cement Surfacing: Mix and apply according to manufacturer's recommended practices. Apply double sheets of lath on outside edges and corners.

Surface Staining: Apply surface stain to cement surfacing after it has achieved adequate curing. Apply in single or two-coat application as required to match approved samples.

Belay Anchor System: Install belay anchor system fixed components in locations indicated in accordance with 3d climbing wall design model.

2.7 CLEANING

Repair or replace defective work as directed by Architect upon inspection.

Clean installed unit surfaces. Touch up, refinish, or replace damaged components in a manner acceptable to Architect.

END OF SECTION