

CLIMBING WALLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Custom Climbing Wall.
- B. Related Sections
 - 1. Section "Structural Steel"
 - 2. Section "Rough Carpentry"
 - 3. Finishes

1.2 REFERENCES

- A. CEN/AFNOR – Standards for Artificial Climbing Walls
- B. Uniform Building Code (UBC) 1994 Edition or code of local conformance.
- C. Manual of Steel Construction, Allowable Stress Design, 9th Edition, AISC

1.3 SYSTEM DESCRIPTION

- A. Sculpted artificial climbing wall designed to look and climb like real rock. Required system is to be in the upgraded classification of climbing walls and no wood or foam based systems will be accepted. System can be modular, vacuumed molded, or hand sculpted. No castings will be permitted.

1.4 QUALITY ASSURANCE

- A. Climbing wall manufacturer shall be as specified and shall have a minimum of 10 years experience in the manufacturing of artificial climbing walls. No substitutions will be permitted.
- B. Fabricator/Installer shall be acceptable to the climbing wall manufacturer.
- C. Installer shall have a minimum of two years experience with manufacturer's materials or be supervised by manufacturer's representative.
- D. Fabrication shop visit: Notify Architect at on-set of fabrication.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of the Contract and General Conditions.
- B. Product data including climbing wall manufacturer's specifications, standard details and installation drawings.
- C. Submit 2 samples of climbing wall material, minimum 6 inches by 6 inches, showing color and finish.
- D. Shop drawings indicating layout of climbing wall, dimensions of materials and parts, fastening and anchoring methods, and detail and location of joints.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect products during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Protect climbing wall finish and edges in accordance with manufacture's recommendations.
- C. Store climbing wall components in accordance with manufacture's recommendations

1.7 WARRANTY

- A. Climbing wall manufacturer shall warrant to the original purchaser for one year from the date of completion that its products are free from defects in materials and workmanship.

1.8 COORDINATION

- A. Coordinate installation of climbing wall after primary support structure is installed and painted and before final finishes to climbing wall area have been performed.

1.9 PROJECT CONDITIONS

- A. Building shall be enclosed and capable of maintaining a minimum temperature of 55 degrees F. Climbing wall area shall be supplied with an artificial light source by the General Contractor for duration of climbing wall installation. Lighting shall be of sufficient quantity and brightness to perform detailed work.
- B. General Contractor shall provide multiple temporary power outlets (110V), at various locations around climbing wall area for operation of power tools.

PART 2 - PRODUCTS

2.1 CLIMBING WALL MANUFACTURER

- A. Entre Prises USA 20512 Nels Anderson Place, Bend, Oregon 97701 (541) 388-5463, (541) 388-3248 fax, or others as approved by Owner.

2.2 ARTIFICIAL CLIMBING WALL MATERIALS

- A. Modular curved IMPRINT climbing wall system as manufactured by Entre Prises USA or;
- B. FREEFORM sculpted climbing wall system as manufactured by Entre Prises USA.

2.3 CLIMBING WALL COMPONENTS

- A. Curved IMPRINT panels as manufactured by Entre Prises USA.
 - 1. Curved IMPRINT panels shall be made of fiber reinforced polymer concrete using a vacuum molding process.
 - 2. Panel system shall be compatible with modular structural support system (2.3C) and shall allow re-configuration of climbing surface topography.
 - 3. Panel system shall be attached to modular structural support system (2.3C) using four corner brackets per panel.
 - 4. Panel system must be modular and capable of achieving various panel orientations and configurations including overhangs, vertical faces, below vertical slabs, arêtes and dihedrals.
 - 5. Panel system shall incorporate the ability to achieve monolithic three-dimensional curvature of the finished surface.

6. Panel system shall provide integral molded climbing holds as well as modular climbing hold attachment locations compatible with 3/8"-16 threaded fasteners for surface mount.
 7. Thickness
 - a. Edge; 1/2" ± 1/8"
 - b. Field; 1/2" ± 1/4"
 8. Sculpted surface features; 1 to 2 inches, additional thickness from normal body at all flush mount climbing hold locations and at random locations.
 9. Finishes
 - a. Polymer concrete surface with micro surface relief climbing features occurring at random locations.
 - b. Color: Granite Gray Mix #8, from manufacturer's standard color selection.
- B. FREEFORM sculpted climbing wall system as manufactured by Entre Prises USA.
1. Freeform climbing wall system shall be made of fiber reinforced polymer concrete using a hand sculpted fiberglass composite lay-up process.
 2. Freeform climbing wall system shall be compatible with modular structural support system (2.3C), or steel frames.
 3. Freeform climbing wall system shall be attached to modular structural support system (2.3C) using corner attachment plates.
 4. Freeform climbing wall system must be capable of achieving various configurations including overhangs, vertical faces, below vertical slabs, arêtes and dihedrals.
 5. Freeform climbing wall system shall incorporate the ability to achieve monolithic three-dimensional curvature of the finished surface.
 6. Freeform climbing wall system shall provide integral molded climbing holds as well as modular climbing hold attachment locations compatible with 3/8"-16 threaded fasteners for surface mount.
 7. Thickness approx. 5/8"
- C. Integrated modular support structure
1. The support structure shall be modular in nature and capable of transferring all applied design loads back to the primary vertical support structure that lie parallel to the projected plane of the climbing surface.
 2. Integrated modular support structure shall be made of pinch pipe members capable of transferring all design loads from the climbing wall to the primary support structure via a linear attachment channel strut as manufactured by Unistrut, Globe or equal (supplied and installed by Steel Subcontractor).
 3. Major components of the modular support structure are as follows:
 - a. Pinch pipe members shall be fabricated from steel pipe, ASTM A53 Grade A, with both ends press formed.
 - b. Corner hardware shall be fabricated from steel. Corner hardware shall be attached to the climbing wall panels on the panel corner.
 - c. Pinch pipe to channel rail connections shall be connected with angle clips fabricated from 2-1/2" angle steel ASTM A36.
- D. Unistrut P1000. Include compatible channel nuts (supplied by Steel Subcontractor)
1. Strut shall be attached to primary support structure columns as shown in drawings by Entre Prises, USA.
 2. Finish on above strut shall be the following: (Architect to specify paint color)
 - a. Paint

- E. Primary support structure (supplied and installed by owner's Steel Subcontractor)
 - 1. Primary support members will be sized and detailed by engineering calculations carried out by an engineering consultant and supplied by Entre Prises, USA. The engineering calculations will outline the reactions generated by the climbing wall.
 - 2. Anchorage details for the primary support structure and floor anchors will be provided by Structural Consultants.
 - 3. Finish on above primary support structure shall be the following: (Architect to specify paint color)
 - a. Paint
- F. Steel Plates, Angle and Bars: ASTM A36

2.4 CLIMBING WALL FABRICATION

- A. Composition
 - 1. Curved IMPRINT
 - 2. Freeform
- B. Resins: Iso polyester resins / UV stabilized.
- C. Aggregate:
 - 1. Natural washed sands
 - 2. Colored sands
 - 3. Expanded silicates
 - 4. Other fillers
- D. Reinforcing:
 - 1. Chopped fiber added to polymer concrete for the Imprint System
 - 2. 2 oz. Chopped strand mat across back of panel for Imprint and 2 layers minimum of mat fiberglass for Freeform.
- E. Average weight = 5.8-9 lbs./sq. ft.
- F. Average pinch pipe support structure weight = 2.5 lbs./sq. ft.
- G. Projected Imprint panel size: 39 1/4" x 39 1/4".
Projected Freeform panel size: 39 1/4" X TBD based on design.

2.5 PRIMARY SUPPORT STRUCTURE FABRICATION

- A. General: All structural steel and structural steel work shall conform to the specifications for design, fabrication and erection of structural steel for buildings of the American Institute of Steel Construction (AISC) Code of Standard Practice, and to the requirements of local building codes.
 - 1. Material: Steel shall consist of A36, A500B for tube steel and Schedule 40, A53, Type S, Grade B for Standard weight structural pipe unless noted otherwise.
- B. Welding: All welding shall conform to the AISC and the American Welding Society (AWS) Standard Code for Arc and Gas Welding in Building Construction. All welding shall be performed by AWS certified welders. The technique of welding, the workmanship, appearance and quality of welds and the methods used in correcting nonconforming work shall be in accordance with "Section 3-Workmanship" and "Section 4-

Technique” of the AWS Structural Welding Code-Steel, D1.1. Minimum size of welds shall be 1/8”. Minimum return shall be 1”. All welds shall be executed using E70XX electrodes.

1. Field Welding: Shop paint on surfaces adjacent to welds shall be wire-brushed to reduce paint film to a minimum.
 2. Alignment: No permanent welding shall be performed until as much of the structure has been properly supported, to remove the dead load and thereby allow proper alignment.
 3. Surfaces Adjacent to Field Welds: Surfaces within 2” of any field weld location shall be free of materials that would prevent proper welding or produce toxic fumes during welding.
- C. Dimensions: Dimensions given in Drawings prepared by Entre Prises are final fabricated dimensions. Steel Subcontractor is responsible for allowances to member lengths to obtain these final dimensions. Dimensions tolerances for centerline of strut to strut are critical. Tolerances for member and plate dimensions shall not exceed 1/32”.
- D. Quality Control:
1. General: The Steel Subcontractor shall provide quality control procedures to the extent that he deems necessary to assure that all work is performed in accordance with Division 5, this Specification and Drawings provided by Entre Prises USA. In addition to the Steel Subcontractors quality control procedures, material and workmanship at all times may be subject to inspection by design engineers representing Entre Prises.
 2. Rejections: Material or workmanship not in reasonable conformance with the provisions of this Specification may be rejected at any time during the progress of work.

2.6 FASTENERS

A. Imprint Panel:

1. Concealed; shall be 1/2” –13, Grade 5 hex head bolts with 1/2” flat washers under head and hardened, Grade C locknuts.

B. Freeform:

2. Concealed; shall be 1/2” –13, Grade 5 hex head bolts with 1/2” flat washers under head and hardened, Grade C locknuts.

C. Modular Hand Hold:

1. Shall be 3/8” – 16 socket head cap screws or flat head cap screws of appropriate length as suggested by the manufacturer.

D. Modular Hand Hold attachment backer plates:

1. Shall be made of stainless steel nut welded to a 16 gauge (min.) stainless steel plate.

E. Climbing Protection/Anchors:

1. Lead Bolts:

- a. U.I.A.A. approved bolt hangers shall be attached through the panel into the corner hardware using, minimum, a 3/8” Grade-8 button head cap screw.
- b. The 3/8” button head cap screw shall be of sufficient length to extend through the corner hardware and through a backup locknut behind the hardware.

2. Belay Anchors:
 - a. Each belay anchor shall consist of two (2) U.I.A.A. approved bolt hangers attached to two horizontally adjacent corner brackets as per "Lead Bolts" above.
 - b. Minimum horizontal distance between bolt hangers shall be 6 inches.
3. Floor Anchors: (installed by Owner's Steel Subcontractor)
 - a. Each floor anchor shall consist of two Rawl expansion bolts & UIAA bolt hangers installed per manufacturer's specifications.
 - b. Location shall be as specified on Climbing Wall Drawings prepared by Entre Prises.

PART 3 - EXECUTION

3.1 PRE-INSTALLATION INSPECTION-OPTIONAL

- A. Verify that all surfaces are ready to receive work and are within specified tolerances.
- B. Beginning of installation means installer accepts conditions of existing surfaces.
- C. Verify that layout of the materials or equipment will not interfere with installed climbing wall.

3.2 INSTALLATION

- A. Erection of the climbing wall system shall be in accordance with manufacturer's recommendations.
- B. Erection shall be accomplished by a fully trained, factory authorized erector in accordance with Section 1.4.
- C. Complete wall shall comply with specified tolerances and shop drawing requirements.

3.3 TOLERANCES

A. Panel Tolerances

1. Panel bow: max. 0.8% of panel dimension in width and length.
2. Panel dimensions: All panel dimensions shall be $\pm 1/8$ " of dimensions shown on shop drawings.
3. Panel edges shall be sharp, true and vary less than $1/16$ " from a straight line.
4. Panels may show non-structural micro surface cracks, not greater than $1/32$ ".

B. Strut Tolerances

1. The face of the strut may be displaced no more than $1/8$ " from the flush face plane. Maximum displacement between extreme forward and aft displaced shall not exceed $1/4$ ".
2. Center to center spacing of strut shall be displaced no more than $1/8$ " from established dimensions shown on the drawings. Maximum displacement between extreme (outside) struts shall not vary more than $1/4$ " from established dimensions.

3.4 CLEAN-UP

- A. Clean area of debris from installation of climbing panels.

3.5 INSPECTION

- A. The completed climbing wall shall undergo a full complete final inspection by a duly trained representative of the manufacturer and shall be certified by the manufacturer that the finish product has been manufactured and erected in accordance with the manufacturer's approved installation drawings and these contract documents.
- B. The completed climbing wall shall undergo a full and complete final inspection by the Owner or Owners representative at the completion of climbing wall installation.

4.6 PROTECTION

- A. Protect climbing wall from damage during erection.
- B. General Contractor to provide final protection in a manner acceptable to the Owner or Owners representative that insures the climbing wall will be without damage or deterioration at time of substantial completion.

END OF SECTION