

SECTION 11486 or 11 67 23

SHOOTING RANGE EQUIPMENT

PART 1 GENERAL

- 1.1 SECTION INCLUDES
 - A. Commercial, Law Enforcement and Military Range Equipment.
 - B. Turn-key Design and Construction Services:
 - 1. Bullet Traps.
 - 2. Target Systems
 - 3. Knee wall
 - 4. Ballistic Rubber.

1.2 RELATED SECTIONS

- A. Section 02300 Earthwork.
- B. Section 03150 Concrete Accessories: Concrete anchors
- C. Section 03300 Cast-In-Place Concrete.
- D. Section 05100 Structural Metal Framing.
- E. Section 05500 Metal Fabrications.

1.3 REFERENCES

- A. ASTM E 84 Test method for the Surface Burning Characteristics of Building Materials.
- B. American Welding Society (AWS) D1.1 Structural Welding Code Steel.
- C. ASTM A514/A514M Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding.
- D. ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- E. ASTM C136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- F. Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
- G. National Rifle Association (NRA) of America The NRA Range Source Book.
- H. Environmental Protection Agency (EPA) Best Management Practices for Lead at Outdoor Shooting Ranges.

- I. Public Law: Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.
- J. Test Report: Ballistic Standards by Product, dated December 31, 2008 by Range Systems.
- K. ASTM E90 Laboratory Sound Transmission Class
- L. CEHNC 1110-1-23, USACE Design Manual for Ranges http://www.hnd.usace.army.mil/rdg/InterTemplate.aspx.
- M. TC 25-8, Army Training Ranges, 05 April 2004 https://atiam.train.army.mil/soldierPortal/atia/adlsc/view/public/7465-1/TC/258/TOC.HTM.
- N. US Army Study (Picatinny Arsenal) ballistic rubber capabilities and performance testing. Acceptable penetration and stopping power with specific use of 7.62 mm (M80 Ball) and 5.56 mm (M855 Ball). Field-test shows minimal ricochet at limited incidence of angle with specific use of 7.62 mm (M80 Ball), 5.56 mm (M855 Ball and M193 Ball) from M14 rifle, M16A2, M16A1, and the M4A1 carbine.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit shop drawings prepared by the manufacturer showing plans, sections, elevations, layouts, profiles, and product component locations, including anchorage, bracing, fasteners, accessories, and finishes.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Closeout Submittals: Provide manufacturer's maintenance and operation instructions that include recommendations for periodic checking and adjustment of systems and maintenance of all components. One year warranty on manufacturing defects.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of 5 years manufacturing similar equipment in CONUS LE applications and be a certified contract holder for the General Services Administration (GSA) with a current license.
- B. Installer Qualifications: Minimum 5 years' experience installing similar LE CONUS equipment and acceptable to the equipment manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solventbased materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials protected from exposure to rain, snow or other harmful weather conditions

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: RANGE SYSTEMS which is located at: 5121 Winnetka Ave. N.; New Hope, MN 55428; Toll Free Tel: 888-999-1217; Tel: 763-533-9200; Fax: 763-537-6657; Email: <u>request info (briang@range-systems.com)</u>; Web: <u>www.range-systems.com</u>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SYSTEM DESIGN AND INSTALLATION SERVICES

- A. Provide the following services in connection with the delivery of ballistic range systems:
 - 1. Sales and Customer Support: Provide knowledgeable customer service and sales staff familiar with the requirements of live fire shooting environments.
 - 2. Design: Provide design staff experienced in designing live fire environments, and the products used in those environments.
 - a. Design/Engineering/Architectural Services.
 - b. Environmental Control (HVAC Systems).
 - 3. Technical Support: Technical personnel shall have the experience and knowledge to provide equipment installation, on-site technical support, new equipment training, and operations and maintenance guidance.
 - a. Installation.
 - b. On-site Technical Support.
 - c. Maintenance Programs.
 - 4. Equipment shall be assembled entirely by mechanical fasteners. No on the job cutting or welding is permitted.

2.3 RANGE DESIGN CRITERIA:

- A. Bullet Traps:
 - Encapsulator[™] Grantrap as manufactured by Range Systems for capturing jacketed, semi-jacketed and non-jacketed, shot and slug projectiles with velocities 600 feet per second (FPS) (183 meters) to .308/7.62 mm grade, certified up to 3600 foot-pounds (4881 joules) of impact. Encapsulator[™] Grantrap captures projectiles fired from oblique angles and point-blank range without back-splatter or ricochet. Tracer or incendiary rounds are NOT permitted.
 - a. Trap Assembly includes a support frame inclined relative to the direction of incoming projectiles.
 - b. Support frame includes an inclined support surface fabricated from 10 gauge steel and supported by a steel truss structure arranged and configured to properly support the granular rubber media.
 - c. Rubber granulate material fills the area within the support frame.
 - d. Dura-Bloc[™] ballistic rubber forms the front edge of the trap assembly to contain the rubber granulate fill and capture, rather than redirect,

errant rounds.

- e. A hopper located above the target region of the trap provides a supplemental volume of rubber granulate to maintain a constant depth of material. The front facing of the hopper is constructed of AR 500 steel and covered with 2 inch (51 mm) thick Dura-Panel[™] rubber to provide ballistic protection and capture errant shots. To accommodate lower ceiling height, trap assembly will be complete without hopper components.
- f. An optional self-healing rubber membrane cover reduces migration of rubber granulate material.
- g. Trap can be configured in 10ft. or 12ft configurations.
- h. Trap can have granular rubber depth of 18" (.308), 24" (.338) or 32" (50Cal) to account for different highest allowable calibers.
- B. Target Systems: Placement as indicated on Drawings.
 - The Pro-Turn 360 is a fixed/stationary target mechanism with full 360° turning capabilities. Pro-Turn 360 is capable of running preprogrammed scenarios and has optional hit sensing and programmable hit reaction capabilities. (optional Hit sensing for Ground Mount only)
 - 2. Full-turning face/edge/back for shoot/don't shoot training
 - 3. All electric 120VAC Powered, (battery powers option available)
 - 4. For use as firearms qualification & tactical training aids
 - 5. Flexible and versatile for use with any cardboard, paper, or plastic target
 - 6. Standard 600-meter, with an optional 2,000-meter wireless range
 - 7. Hit reactive for dynamic training or scoring. Reacts to all simulated munitions and airsoft, as well as standard Live Fire rounds.
 - 8. The Pro-Turn 360 can either be ground mounted for outdoor or indoor applications or overhead mounted for indoor or outdoor applications.
 - 9. The Pro-Turn 360 turning target turns up to 360°, as programmed by the user, to show a friend/foe image to force the shooter to make a shoot/ no-shoot decision. The target system is programmable to run simple and complex scenarios, and will randomly turn the targets to edge, friend, and foe after a preset amount of time. The actuators are all uniquely addressed, so while the operator is running only one program, each target will be performing the unique functions it was programmed to perform.
 - 10. Each Pro-Turn 360 has hit sensing capability to enhance training. The system counts and reports the number of hits each target has received and the target will react as programmed in response to hits.
 - 11. For example a programmed scenario could read:
 - a. After two bullet strikes against the target, the system will register a kill and turn the target to edge, then;
 - b. After three seconds the target will present friend, then;
 - c. After 5 seconds it will present foe/and require three shots to kill.

Master Control: Placement as indicated on Drawings.

- 12. Master control shall be furnished to provide manual and automatic (programmed) operation of the firing range.
- 13. The master control console shall consist of the necessary hardware and software components necessary to carry out the functions described in this specification.
- 14. Qty (1) Wireless Tablet interface controller with radio transmitter
- 15. Identification
- 16. The master control shall be either a desktop located Master Control Console, or handheld wireless control, or both.

- 17. Functional description
- 18. The master control console has the ability to provide the below listed functions, but shall be limited to the capabilities of the specific equipment outlined within this division of work:
- 19. Manually or automatically control has the full potential functions of all target types listed in the Bill of Material including face-left, face-right, random face, conceal, re-expose last face, and target movements such as downrange positioning and return for monorail target systems.
- 20. Allow entry, editing, permanent storage, retrieval, execution and deletion of conventional courses of fire (one shooter/one target) as well as advanced programs (one shooter/multiple targets).
- 21. Permit starting, stopping, pausing, continuing, and restarting programmed courses and scenarios.
- 22. Stop course in progress in the event of an emergency determined by the operator or automatically upon an encroachment into the secure area protected by the optional security system.
- 23. Allow the writing of programmed scenarios to perform automatic, timed target operation.
- 24. Sections of programs can be skipped, repeated and executed individually.
- C. Ballistic Knee Wall System: As shown on Drawings.
 - 1. Rifle rated ballistic tactical wall system as manufactured by Range Systems is modular to facilitate ease of installation.
 - Ballistic tactical wall system is constructed of 3/8 inch (9.5 mm) thick AR 500 steel plate backer and finished with a front covering of 2 inch thick (51 mm) Dura-Panel[™] ballistic rubber. Each ballistic rubber wall panel measures 2 feet by 2 feet by 2 inches (610 mm by 610 mm by 51 mm) and encapsulates up to 2,500 rounds per panel. Manufacturer's dimensional tolerance +/- 1/4 inch length and width.
 - 3. Knee wall is typically 36 inches high to allow protection of targets behind the wall mounted in front of bullet trap or berm.

2.4 BALLISTIC RUBBER PROTECTION MATERIAL

A. Product: Dura-Panel as manufactured by Range Systems. NSN: 9320-01-565-6156. Provides anti-ricochet protection at indoor and outdoor ranges when used as part of the Encapsulator system. Made of patented rubber composite. Each panel measures 24 inches by 24 inches by 2 inches (610 mm by 610 mm by 51 mm) and weighs 34 lb (15.4 kg). Dura-Panel™ is designed to prevent ricochet and splatter of standard pistol and rifle rounds up to .308 / 7.62 mm. Dura-Panel can be applied directly to steel, concrete or plywood using an industrial adhesive. Each panel will take approximately 2200 rounds before replacement is required depending on bullet type and distribution of wear.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until exterior locations, structure and installing surfaces have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION