SECTION 11 67 23

SHOOTING RANGE EQUIPMENT

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\*\* NOTE TO SPECIFIER \*\* InVeris Training Solutions; shooting range and firearms training equipment.  
This section is based on the products of InVeris Training Solutions, which is located at:296 Brogdon Rd.Suwanee, GA 30024Toll Free Tel: 800-813-9046Tel: 678-288-1090Fax: 678-288-1520Email: [request info (its-marketing@inveristraining.com)](https://arcat.com/rfi?action=email&company=InVeris%252BTraining%252BSolutions&message=RE%253A%2520Spec%2520Question%2520(11480ivt)%253A%2520&coid=31297&spec=11480ivt&rep=&fax=678-288-1520)  
Web: <https://inveristraining.com>   
 [ [Click Here](https://arcat.com/company/inveris-training-solutions-31297) ] for additional information.  
InVeris Training Solutions (formerly Meggitt Training Systems) is the leading supplier of integrated live-fire and virtual weapons training systems supporting defense forces, law enforcement agencies and commercial shooting range owners. InVeris and its legacy company, Caswell International, invented the modern-day shooting range. Literally. In 1926 we invented the world's first target carrier, followed by the world's first bullet trap, indoor ventilated range, wireless target carrier, and the list continues. Our shooting range innovations can be seen on the 15,000+ shooting ranges and 80,000 infantry targets fielded around the world.  
InVeris Training Solutions provides the shooting range design, equipment, and installation to meet your requirements. Headquartered in Suwanee, Ga. in a 235,000 square foot facility, InVeris Training Solutions employs more than 400 people at facilities in the United States, Australia, Canada, Netherlands, the Middle East Singapore, and the United Kingdom. With 24/7 customer service and exemplary warranty offerings, InVeris is ready to stand with you.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Shooting Range Equipment of the following types:
       1. Bullet Traps and Collection.
       2. Shooting Stalls.
       3. Baffles and Guards.
       4. Target Systems.
       5. Audio and Visual Communication Systems.
       6. Range Controls.
       7. Mobile Ranges.
       8. Shoot Houses.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
       1. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
       2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Materials.
    2. International Organization for Standardization (ISO):
       1. ISO 9001 - Quality Management.
       2. ISO 14001 - Environmental Management.
    3. Underwriters Laboratories (UL):
       1. UL 94 - Standard for Safety of Flammability of Plastic Materials for Parts in Devices and Appliances.
       2. UL 121.
       3. UL 752 - Standard for Bullet-Resisting Equipment.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Typical installation methods.
     3. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction. Include all electrical data and connection details. Coordinate all details on drawings of the exact locations for mechanical work
  2. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum 25 years documented experience.
     2. Supplier shall have a current and valid ISO 9001 Quality Management System and an ISO 14001 Environmental Management System.
     3. Installer Qualifications: Company specializing in performing Work of this section with Lead Supervisor / installer having a minimum two years documented experience with projects of similar scope and complexity.
        1. Installation shall be under the direct supervision of the Manufacturer.
     4. Source Limitations: Provide all products of this Section from a single manufacturing source to ensure compatibility and product performance capability.
  3. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  4. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
     2. Deliver all equipment boxed or crated to provide protection during transit and job storage.
     3. Inspect equipment upon delivery for damage. Minor damages may be repaired, provided the finish items are equal in all respects to new work and acceptable to the Owner and Architect; otherwise, remove and replace damaged items immediately.
     4. Store equipment at the site under cover in a secured place. Store equipment off the floor and in a manner to promote air circulation. Avoid the use of non-vented plastic or canvas shelters that could create a humidity chamber.
  5. PROJECT CONDITIONS
     1. Projects Prime Contractor to 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 recommended limits.
  6. WARRANTY
     1. Manufacturer's Warranty: Provide manufacturer's standard limited warranty for defects in workmanship and materials for a period of one year from the date of substantial completion.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: InVeris Training Solutions, which is located at:296 Brogdon Rd.Suwanee, GA 30024Toll Free Tel: 800-813-9046Tel: 678-288-1090Fax: 678-288-1520Email: [request info (its-marketing@inveristraining.com)](https://arcat.com/rfi?action=email&company=InVeris%252BTraining%252BSolutions&message=RE%253A%2520Spec%2520Question%2520(11480ivt)%253A%2520&coid=31297&spec=11480ivt&rep=&fax=678-288-1520);Web: <https://inveristraining.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Delete Articles not required.

* 1. BULLET TRAPS AND COLLECTION

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: GranTrap, Model LE7500-OT; as manufactured and supplied by InVeris Training Solutions.
       1. Performance and Design Requirements
          1. Maximum Bullet Velocity: 3600 ft per sec (1097 m per sec).
          2. Maximum Bullet Energy: 3600 ft-lbs (4881 Nm).
       2. Description: Designed for all small arms including handguns, shotguns, and rifles. Utilizes specialty treated rubber granulate made from recycled materials, that safely stops bullets and maintains their basic original shape, thus minimizing broken up lead particles released into the atmosphere. Allows recovery of largely intact spent rounds.
       3. Depth: Minimum 12 ft 4 inches (3759 mm).

\*\* NOTE TO SPECIFIER \*\* Delete height options not required.

* + - 1. Height: 9 ft (2743 mm). Standard.
      2. Height: 12 ft (3658 mm).
      3. Height: 8 ft (2438 mm). Use for low ceiling situations.
      4. Front Surface: Slopped.
      5. Construction: Stepped steel bedplate, steel box tube support frame.
         1. Self-supporting.
         2. Mechanically fastened.
         3. Upper holding bins shall be part of frame support assembly and not require overhead or rear wall support.
         4. Upper frame shall support the armor plate upper slope sheet and extend no less than 5 ft (1524 mm) from the rear side of the trap assembly.
      6. Upper Hopper Bin: Angled 3/8 inch (9.5 mm) AR500 armor plate slope sheet. Filled with replenishment rubber granulate (GranTex).

\*\* NOTE TO SPECIFIER \*\* Delete plate thicknesses not required.

* + - 1. Bullet Trap Sidewalls: 3/8-inch (9.5 mm) AR500 armor plate.
         1. AR500 Armor Plate. (Rifle): 3/8 inch (9,5 mm),
         2. AR500 Armor Plate. (HD Pistol /Light Rifle use): 1/4 inch (6 mm).
         3. HRS (Pistol use): 1/4 inch (6 mm).
         4. Height: 8 ft (2438 mm).
         5. Depth: To match the depth of the bullet trap rubber.
         6. Seams: Vertical only.
      2. Rubber Granules: GranTex.
         1. Chopped rubber, predominately free of cording, threads, steel belting pieces and cotton fibers. Nominal Rubber Size: 7/8 inch (22 mm).
         2. Captures fired rounds with little or no fragmentation or back-splatter.
         3. Fire retardant treated with treatment that meets ASTM E108 Class A standards.
         4. Meets ASTM E84 Class A requirements for flame spread and smoke development.
      3. Bed Plate: 10-gauge steel, in a deep stepped configuration. Provides a safety barrier.
      4. Impact Area Step Depth: Minimum 24 inches (610 mm).
      5. Back-Up Safety Bin: Internal, separately enclosed, conveyor belt faced, rubber granule filled. Minimum 10 inches (254 mm) depth.
      6. Capacity:
         1. Primary Impact Area: Minimum 8 cu ft (227 liters) per section.
         2. Replenishment Bin: Minimum 19 cu ft (538 liters) per section.
         3. Back-Up Safety Bin: Minimum 10 cu ft (283 liters) per section.
      7. Finish: Primed and painted.
    1. Basis of Design: GranTrap, Model LE7500OT-OD, Outdoor as manufactured and supplied by InVeris Training Solutions.
       1. Performance and Design Requirements:
          1. Maximum Bullet Velocity: 3600 ft per sec (1097 m per sec).
          2. Maximum Bullet Energy: 3600 ft-lbs (4881 Nm).
       2. Description: Designed for all small arms including handguns, shotguns, and rifles. Utilizes specialty treated rubber granulate made from recycled materials, that safely stops bullets and maintains their basic original shape, thus minimizing broken up lead particles released into the atmosphere. Allows recovery of largely intact spent rounds.
       3. Depth: Minimum 12 ft 4 inches (3759 mm).

\*\* NOTE TO SPECIFIER \*\* Delete height option not required.

* + - 1. Height: 9 ft (2743 mm). Standard.
      2. Height: 12 ft (3658 mm)'
      3. Front Surface: Slopped.
      4. Construction: Stepped steel bedplate, galvanized steel box tube support frame.
         1. Self-supporting.
         2. Mechanically fastened.
         3. Upper holding bins shall be part of frame support assembly and not require overhead support structure.
         4. Upper frame shall support the armor plate upper slope sheet and extend no less than 5 ft (1524 mm) from the rear side of the trap assembly.
         5. Fasteners and Hardware: Galvanized steel or stainless steel.
         6. Incorporate weep and drainage holes to release rainwater and condensation.
      5. Upper Hopper Bin: Angled 3/8 inch (9.5 mm) AR500 armor plate slope sheet. Filled with replenishment rubber granules.
      6. Sidewalls: 10-gauge galvanized steel.
      7. Rubber Granules: GranTex.
         1. Chopped rubber, predominately free of cording, threads, steel belting pieces and cotton fibers. Nominal rubber size - 7/8 inch (22 mm).
         2. Captures fired rounds with little or no fragmentation or back-splatter.
         3. Fire retardant treated with treatment that meets ASTM E108 Class A standards.
         4. Meets ASTM E84 Class A requirements for flame spread and smoke development.
      8. Bed Plate: 10-gauge steel, in a deep stepped configuration. Provides a safety barrier.
      9. Impact Area Step Depth: Minimum 24 inches (610 mm).
      10. Back-Up Safety Bin: Internal, separately enclosed, conveyor belt faced, rubber granule filled. Minimum 10 inches (254 mm) depth.
      11. Capacity:
          1. Primary Impact Area: Minimum 8 cu ft (227 liters) per section.
          2. Replenishment Bin: Minimum 19 cu ft (538 liters) per section.
          3. Back-Up Safety Bin: Minimum 10 cu ft (283 liters) per section.
      12. Finish: Factory cleaned and coated with an inorganic zinc primer and then finish painted with marine multipurpose epoxy paint, White color.
    1. Basis of Design: GranTrap, Model LE7500-50 Cal as manufactured and supplied by InVeris Training Solutions.
       1. Performance and Design Requirements
          1. Maximum Bullet Velocity: 3600 ft per sec (1097 m per sec).
          2. Maximum Bullet Energy: 8100 ft-lbs (10982 Nm).
       2. Description: Designed for all small arms including handguns, shotguns, and rifles. Utilizes specialty treated rubber granulate made from recycled materials, that safely stops bullets and maintains their basic original shape, thus minimizing broken up lead particles released into the atmosphere. Allows recovery of largely intact spent rounds.
       3. Depth: Minimum 14 ft (4267 mm).

\*\* NOTE TO SPECIFIER \*\* Delete height options not required.

* + - 1. Height: 9 ft (2743 mm).
      2. Height: 12 ft (3658 mm).
      3. Front Surface: Slopped.
      4. Construction: Stepped steel bedplate, steel box tube support frame.
         1. Self-supporting.
         2. Mechanically fastened.
         3. Upper holding bins shall be part of frame support assembly and not require overhead support.
         4. Upper frame shall support the armor plate upper slope sheet and extend no less than 5 ft (1524 mm) from the rear side of the trap assembly.
      5. Upper Hopper Bin: Angled 3/8-inch (9.5 mm) AR500 armor plate slope sheet. Filled with replenishment rubber granulate (GranTex).

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sidewalls: 3/8inch (9.5 mm) AR500 armor plate.
         1. Height: 8 ft (2438 mm).
         2. Depth: To match the depth of the bullet trap rubber.
         3. Seams: Vertical only.
      2. Rubber Granules: GranTex.
         1. Chopped rubber, predominately free of cording, threads, steel belting pieces and cotton fibers.
         2. Captures fired rounds with little or no fragmentation or back-splatter.
         3. Fire retardant treated with treatment that meets ASTM E108 Class A standards.
         4. Meets ASTM E84 Class A requirements for flame spread and smoke development.
      3. Bed Plate: 10-gauge steel, in a deep stepped configuration. Provides a safety barrier.
      4. Impact Area Step Depth: Minimum 24 inches (610 mm).
      5. Rubber depth (Horizontal) No less than 56 inches (1422 mm)
      6. Back-Up Safety Bin: Internal, separately enclosed, conveyor belt faced, rubber granule filled. Minimum 10 inches (254 mm) depth.
      7. Capacity:
         1. Replenishment Bin: Minimum 19 cu ft (538 liters) per section.
         2. Back-Up Safety Bin: Minimum 10 cu ft (283 liters) per section.
      8. Finish: Primed and painted.
    1. Basis of Design: Venetian Blind Trap, Model LE2400 as manufactured and supplied by InVeris Training Solutions.
       1. Description: Designed for installations where range space is minimal.
       2. Maximum Bullet Velocity: 2000 ft per sec
       3. Depth: 30 inches (762 mm).
       4. Front Surface: Series of five angled 1/4 inch (6 mm) AR 500 baffles that direct bullets into a deceleration chamber.
       5. Leading Edge: 1/4 inch (6 mm) thick alloy to catch and contain back splatter.
       6. Spent lead particles drop into steel collection tray.
       7. Ceiling Slope Sheets, Sidewall Plates, and Wall Deflector Plates: 1/4 inch (6 mm) hot rolled steel.
       8. Impact Plates, Back Plates, Leading Edges, Floor Deflector Assemblies, and Deceleration Chamber: AR 500.
       9. Finish: Factory primed.
    2. Basis of Design: EscalatorSteel Bullet Trap, Model LE5000 as manufactured and supplied by InVeris Training Solutions.
       1. Description: Designed to stop all bullets fired from the firing line directly into the bullet trap. Designed for constant use with:
          1. Handgun ammunition including .22, .357, .38, .45, .44 magnum.
          2. Handgun or machine gun ammunition including 9 mm, 10 mm, and .40 caliber.
          3. Lead shotgun ammunition including 12-gauge lead slugs.
          4. Soft nose rifle ammunition with muzzle energies under 4,000 ft-lbs (5423 Nm) and velocity not exceeding 4,000 ft (1219 meters) per sec, including .308, 30 calibers, and .223.

\*\* NOTE TO SPECIFIER \*\* Offered in 1/2 inch (13AR500 Armor Plate impact plates.

* + - 1. Depth: 27 ft (8230 mm).
      2. Height: 9 ft (2743 mm).
      3. Impact Plates and Sidewalls: AR 500 steel.

\*\* NOTE TO SPECIFIER \*\* Delete thickness options not required.

* + - * 1. Thickness: 1/4 inch (6 mm).
        2. Thickness: 3/8 inch (9 mm).
        3. Thickness: 1/2 inch (13 mm).
      1. Interchangeable and reversible lower impact plates and over trap plates arranged to assure a multiplicity of impacts before the particles enter the deceleration chamber for collection.
      2. Frames: Special heat-treated steel. Stanchion supports at each firing lane, do not require tensioned cross cable supports.
      3. Asymmetrical geometry of trap allows running man systems, turning targets or pop-up targets to be utilized within the trap area and without interference with the trap.
      4. Angle: 15 degree angle.
      5. Scroll Assembly: Readily removable for inspection, cleaning, and replacement.
      6. Divided into spaces corresponding to shooting points. Targets approximately centered on respective impact plates and divisions between impact plates occur roughly midway between target centers.
      7. Recovery System: Spent lead sealed pails.

\*\* NOTE TO SPECIFIER \*\* Delete mechanical bullet / lead recovery system option if not required.

* + 1. Particle Recovery Conveyor System: (Belt) Lead collection conveyor system - moves particles into a sealed shipping container.
       1. Belt- type conveyor assembly designed to continuously move the lead to a centrally located sealed containers, reducing the exposure of range personnel to the hazards of lead and lead dust.
       2. The lead dust and particles are stored in DOT approved sealed containers. InVeris incorporates a specialized conveyor system which continuously mines the spent bullets, fragments, and dust, moving them to a central collection point.
    2. Particle Recovery Conveyor System: (Auger) Particle Conveyor System moves particles into a sealed shipping container.
       1. Lead collection system includes a screw-type conveyor and sealed collection drum in lieu of the manual buckets. Screw conveyor which attached directly to the bullet trap deceleration chamber.
          1. Auger Shaft: 2-7/16 inch (62 mm) with close clearance screw construction with a 5 HP, 20 RPM beltless drive package.
          2. Conveyor has 6 inch (152 mm) diameter screw conveyor, sealed in a U-trough enclosure running the full width of each of the bullet traps.
          3. Conveyor empties into a sealed storage/transport drum located outside the range or designated area behind the trap.
          4. Backed on -powder coat paint. Painted inside and outside for weather and corrosion resistance.

\*\* NOTE TO SPECIFIER \*\* Delete Dust Collection system option if not required.

* + 1. Basis of Design: Bullet Trap Dust Collection System, Model LE5000 DCS as manufactured and supplied by InVeris Training Solutions.
       1. Filtration System: Airborne particulate cartridge filtration system draws lead dust from the trap opening through the containment chamber and lead conveyor system into a series of low maintenance cartridge filters. Air passes through a HEPA assembly with inlet plenum to provide 99.97 percent cleaning efficiency on .30-micron particles before discharge.
       2. Finish: Factory primed.
       3. Captures lead particulates, fragments, and dust, reducing the potential exposure to range personnel. The high-power exhaust system maintains a negative pressure in the deceleration chamber and collection area.
          1. Exhaust system also acts as a dust collection system, terminating in multiple stages of filtration with HEPA final, to ensure dust containment and collection.
          2. Filter banks are automatically cleaned with a measured air pulse when the pressure drop across the filters reaches a preset level, ensuring long filter life and maximum effectiveness.
          3. System lets the lead particles leave the bullet trap via the supplied sealed container or the final HEPA filters for safe disposal, minimizing dangerous handling.
       4. Features:
          1. Filters have an expanded capacity due to the patented inner cone of filtration media.
          2. Inner cone provides uniform dispersion of back-pulsed air and opens up more useable space for airflow in the dust collector.
          3. All filter media offerings deliver a minimum of 99.99 percent separation efficiency down to 0.5 micron by weight.
          4. Channel baffles installed in the inlet protect the filters from incoming dust and separates the larger dust particles directly into the hopper, reducing the load on the filters.
          5. Filters are automatically back-flush cleaned with periodic pulses of compressed air.
          6. Vertical cartridges provide more efficient pulsing of dust, thus eliminating uneven dust loading associated with horizontally mounted cartridges.
          7. Powerful cleaning system delivers 100 percent more cleaning energy than horizontal filter designs. This includes 6 inch (152 mm) compressed air header, nuzzled purge pipes, diaphragms, and solenoid valves in NEMA 4 enclosure. Diaphragms are factory plumbed to the solenoids.
          8. Quick-open access doors to super-fast cartridge change-out system that does not require entry into the collector.
          9. Cam-operated clamp bars provide easy filter clamping and sealing.
    2. Basis of Design: Safe-N-Clear Handgun Clearing Trap, Model LE1213 as manufactured and supplied by InVeris Training Solutions.
       1. Performance and Design Requirements
          1. Maximum Bullet Velocity: 2000 ft per sec (610 m per sec).
          2. Maximum Bullet Energy: 2200 ft-lbs. (2983 Nm).
       2. Dimensions, HxWxD: 35 x 13 x 18 inches (889 x 330 x 457 mm).
       3. Description: Clearing trap designed to provide a safe and secure location to check, load, and unload a firearm.
       4. Features:
          1. Filled with a thick bed of granulated rubber material that safely deenergizes rounds.
          2. Reinforced rubber screen secured across the trap opening provides a slot for muzzle insertion and serves as a protective barrier against back splatter.
          3. In the event of a discharge, the round is captured virtually intact in the granulated rubber material and is securely contained.
          4. Floor model clearing trap does not require a stand or special mounting hardware to keep it stationary or secure.
    3. Basis of Design: Safe-N-Clear Rifle Clearing Trap, Model LE1216 as manufactured and supplied by InVeris Training Solutions.
       1. Performance and Design Requirements
          1. Maximum Bullet Velocity: 3600 ft per sec (1097 m per sec).
          2. Maximum Bullet Energy: 3600 ft-lbs. (4881 Nm).
       2. Dimensions, HxWxD: 31 x 13.5 x 23 inches (787 x 343 x 584 mm).
       3. Description: Clearing trap designed to provide a safe and secure location to check, load, and unload a firearm.
       4. Features:
          1. Filled with a thick bed of granulated rubber material that safely deenergizes rounds.
          2. Reinforced rubber screen secured across the trap opening provides a slot for muzzle insertion and serves as a protective barrier against back splatter.
          3. In the event of a discharge, the round is captured virtually intact in the granulated rubber material and is securely contained.
          4. Floor model clearing trap does not require a stand or special mounting hardware to keep it stationary or secure.
    4. Basis of Design: Ballistic Projectile Recovery System as manufactured and supplied by InVeris Training Solutions.
       1. Description: Provides a safe and reliable means for recovering spent bullets for forensic examinations.
       2. Dimensions, (HxWxD): 36 x 101.5 x 50.5 inches (914 x 2578 x 1283 mm).
       3. Material: : 10-gauge stainless steel.
       4. Features:
          1. Raised walkway on one end and side wall of the tank provides easy access when recovering projectiles.

Surface: Resilient, all-weather rubber coating.

* + - * 1. Filled with chlorinated water that is circulated and filtered by a pump.

Pump creates turbulence to break the surface tension and reduce the chance of bullets skipping over the surface.

The pump and filter only need to be operated during shooting or at least thirty minutes a week when the tank is not in use to keep the water free of algae growth.

* + - * 1. Ventilation ports allow lead, unburned powder, and gases to be vented externally.
        2. After firing into the tank, the operator can retrieve the round through an access door on the top of the tank.
        3. Interior light and specially designed tool allow a round to be located and easily retrieved.
  1. SHOOTING STALLS

\*\* NOTE TO SPECIFIER \*\* Select lane divider /stall appearance.

* + 1. Basis of Design: Model SafeZone Shooting Stalls as manufactured and supplied by InVeris Training Solutions.

\*\* NOTE TO SPECIFIER \*\* Specify top and lower Panel Color.

* + - * 1. Black.
        2. Blue.
        3. Gray.
        4. Red.
        5. Transparent upper panel.
        6. Logo: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* If Transparent upper panels are wanted - select available options.

* + - * 1. Transparent Upper Panel Custom etching.
        2. Owner /Buyer to Provide template with desired image / logo / lettering.
        3. Include Glass edge lighting with multicolor LED and a controller.
      1. Pistol Rated:
         1. Maximum Bullet Velocity: 1485 ft per sec (453 m per sec).
         2. Maximum Bullet Energy: 1175 ft-lbs. (1593 Nm).
         3. Ballistic Rating, UL 752: Level 3.
      2. Rifle Rated:
         1. Maximum Bullet Velocity: 3025 ft per sec (922 m per sec).
         2. Maximum Bullet Energy: 3048 ft-lbs. (4133 Nm).
         3. Ballistic Rating, UL 752: Level 8.
      3. Depth: 48 inches (1219 mm).
      4. Features:
         1. Swing down shooter's shelf with a resilient surface, raised edges to prevent accidental drop off, and a recessed tray area.
         2. Acoustical blast shield extends to further shelter adjacent shooters.
         3. Site light illuminates the stall interior.

\*\* NOTE TO SPECIFIER \*\* Delete options below not required.

* + - * 1. Audio and visual communication systems.
        2. Side shelf with accessory hooks.
        3. Red/blue light for law enforcement training.
        4. Wing gate barricade for standing strong and weak hand shooting.
        5. Full height gate barricade.
        6. Lighting: Recessed LED lights provide dimmable lighting for each stall.
        7. Blast Shield: adjacent shooter muzzle blast protection.
        8. Red/blue light for law enforcement training.
        9. Shooter's bench with hooks to keep personal items off the floor.
        10. ADA Compliant adjustable bench heights.
        11. Lane Marker: Illuminating each shooting lane with a lane marker and corresponding lane number.
  1. BAFFLES AND GUARDS

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Air-Space Baffle, Model CB4 and Containment Ceiling, Model SC12, Re-Directive Guard, Model RG as manufactured and supplied by InVeris Training Solutions.
       1. Description: Baffles and Ceilings are comprised of mixed layered panels strategically engineered to contain a misdirected round via the wood facing, containing them within the air space chamber after striking the steel backing plate. Re-guards are bare steel panels typically used at the bullet trap end of the range.

\*\* NOTE TO SPECIFIER \*\* Select plate thickness and Delete material options not required.

* + - 1. Material: 8-gauge mild steel.
      2. Material: 1/4 inch (6.4 mm) thick, AR500 steel.
      3. Material: 3/8 inch (9.5 mm) thick, AR500 steel.
      4. Material: 1/2 inch (13 mm) thick, AR500 steel.
      5. Features:
         1. Minimizes bullet splatter from exiting the panel or returning to the open range area.
         2. Ceiling, lights, ducts, pipes, and range equipment are protected downrange by a series of angled air- space baffles.
         3. Shelters the ceiling area and redirects rounds toward the bullet trap.
         4. Suspended the ceiling, at prescribed angles to the floor, starting at the firing line and extending downrange at the distance and locations as indicated on the drawings.

\*\* NOTE TO SPECIFIER \*\* Delete rating options not required.

* + - 1. Pistol Rated.
      2. Rifle Rated.

\*\* NOTE TO SPECIFIER \*\* Delete guard options not required.

* + - 1. Rubber Air-Space Enclosure Guard: Model EG, utilized for the furthest downrange panels nearest the rubber bullet trap.
      2. Steel Re-directive Guard: Model RG, utilized for the furthest downrange panels nearest the rubber bullet trap.
      3. Baffles and ceiling panels utilizing internal lumber frames and wooden 1/2 inch (013 mm) facings to be Fire Rated, Treated lumber.

\*\* NOTE TO SPECIFIER \*\* Specify type / brand of acoustical finish wanted or Delete if not required.

* + - 1. Acoustic Material: Acoustical material applied to the panel surfaces to assist in noise reduction.
      2. Approved Products: Troy Board / Sonex / PEPP - Flame Spread - 5 or less (ASTM E84) / Smoke -0 (ASTM E84)
    1. Basis of Design: Steel Light Cove Guard, Model JR7 as manufactured and supplied by InVeris Training Solutions.
       1. Description: Utilized for ranges that have a smooth, flush concrete ceiling structure. Protects the light fixtures, pipes, columns, and other ceiling obstructions.

\*\* NOTE TO SPECIFIER \*\* Select plate thickness and Delete material options not required.

* + - 1. Material: 10-gauge steel.
      2. Material: 1/4 inch (6.4 mm) thick, AR500 steel.
      3. Material: 3/8 inch (9.5 mm) thick, AR500 steel.
      4. Material: 1/2 inch (13 mm) thick, AR500 steel.
  1. TARGET SYSTEMS

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: AA2 Single Turning Target System as manufactured and supplied by InVeris Training Solutions.
       1. Description: 360 Degree Turning target for random and concealed placements throughout an indoor or outdoor live-fire range.
       2. Actuations and Hit Modes: Expose, conceal, 90 degree, and rotation up to 360 degrees.
       3. Expose or Conceal Time: 0.5 sec.
       4. Turn Time 90 degrees: 0.33 sec.
       5. Max Target Weight: 10 lbs. (4.5 kg).
       6. Target Size: Holds multiple target types.
       7. Power Supply: AC Power, 115 VAC/230, VAC 50 Hz.
       8. Weight of Unit: 48 lbs. (21.8 kg).
       9. Target Shaft Length: 2 to 4 ft (610 to 1219 mm).
       10. Actuator Enclosure Size: 8 x 8 x 24 inches (203 x 203 x 610 mm).
       11. Features:
           1. Advanced target identification, threat, no threat target engagements.
           2. Collective or individual target control. All targets can be controlled in unison or individually controlled.
           3. Qualifications, and advanced training scenarios can be authored stored and accessed any time using the RM 9K/10K Software and wireless tablet.
           4. Quiet electronic turning motor, eliminating student's audible identification of pneumatic turning targets.
           5. Eliminates maintenance associated with airlines and humidity, and pneumatic component failures with robust turning target motor.
           6. Supports multiple target heads available to support existing customer target frames.
    2. Basis of Design: Delta Turning Target System as manufactured and supplied by InVeris Training Solutions.
       1. Description: A series of target stands linked by connecting tie rods to a single drive unit, ensuring the targets expose and conceal in unison.
       2. Features:
          1. Suitable for both indoor and outdoor ranges, the Delta Turning Targets are secured to a concrete pad or suitable foundation and may be sheltered by a berm or other ballistic guard.
          2. Timed target turning is controlled by the Model EC16 range timer that selectively controls the target functions.
          3. Range timer is portable or can be permanently located in a control room or tower.
          4. Target expose, conceal, cycles and pre-course delay times are set in one second increments from zero to 999 seconds. The course may be programmed to repeat up to 999 times.
          5. Once activated, the range timer loads a preset training course from the internal memory, displaying LCD current course settings.
          6. The LCD display provides operator prompts to assist in each programming step, and targets may be exposed and concealed manually from the range timer when no course is running.
          7. Systems available with up to 10 or 24 target stands per drive unit.
          8. Target stands are available with a variety of target frames, pending the type of targets utilized.
    3. Basis of Design: DP29 Running Man Target System as manufactured and supplied by InVeris Training Solutions.
       1. Description: The target carrier and drive components slide onto the track for easy set up and dismantling, making it ideal for training situations where dedicated range space is not obtainable or at unsecured ranges.
       2. Features:
          1. For permanent range installations, the track can be secured to a concrete pad, mounted to a ballistic wall, or suspended from the ceiling at the target line.
          2. Hand-held range control unit operates on AC power, and allows the operator to control target speed, direction, and start and stop functions.
          3. Target speed can be set from 0 to 100 percent, and direction of travel can be changed at any time, whether the target is in motion or stationery.
          4. Comes with one target carrier and the option of a second carrier for tandem operation on a single drive unit.
          5. Runs two target carriers independently and simultaneously and can be integrated with other range equipment. Each target assembly has its own drive unit that mounts easily to the end of the beam track.
          6. Dynamic braking.
          7. 30 ft (9144 mm) I-beam track included and can be extended to 100 ft (30480 mm).
          8. Power: 120 second -volt AC.

\*\* NOTE TO SPECIFIER \*\* Delete mounting options not required.

* + - 1. Mounting: Ground-mounted.
      2. Mounting: Wall-mounted.
      3. Mounting: Suspended from ceiling. Requires protective coverage via a ceiling panel.
    1. Basis of Design: DP65 Pursuit Moving Target System as manufactured and supplied by InVeris Training Solutions.
       1. Description: The target carrier and drive components slide onto the track for easy set up and dismantling, making it ideal for training situations where dedicated range space is not obtainable or at unsecured ranges.
       2. Features:
          1. For permanent range installations, the track can be secured to a concrete pad, mounted to a ballistic wall, or suspended from the ceiling at the target line.
          2. Hand-held range control unit operates on AC power, and allows the operator to control target speed, direction, and start and stop functions.
          3. Target speed can be set from 0 to 100 percent, and direction of travel can be changed at any time, whether the target is in motion or stationery.
          4. Comes with one target carrier and the option of a second carrier for tandem operation on a single drive unit.
          5. Runs two target carriers independently and simultaneously and can be integrated with other range equipment. Each target assembly has its own drive unit that mounts easily to the end of the beam track.
          6. Dynamic braking.
          7. 30 ft (9144 mm) I-beam track included and can be extended to 100 ft (30480 mm).
          8. Power: 120 Volt AC.
    2. Basis of Design: XWT Wireless Monorail retrievable Target Carrier as manufactured and supplied by InVeris Training Solutions.
       1. Description: The next level of innovative range products available from InVeris Training Solutions. The quiet, smooth, low maintenance wireless carrier is easily operated and programmable, essential for successful training and usability.
       2. Features:
          1. Easily programmable through a wireless controller, allowing uncomplicated intuitive screen operation.
          2. Targets are locally controlled using the Lane Controller or from a control room area using the Primary Master Control Computer.
          3. Programmable maneuvers and scenarios for skill set development and effective training.
          4. Speed control options provide Advance and Retreat training exercises.
          5. Basic and advanced user interfaces support the operator's preferred courses of fire.
          6. Moves along a rail system, powered by an internal direct drive, dual motor system, with anti-static wheels for quieter, smoother operation.
          7. Unique closed track design provides smooth target transportation.
          8. Does not collect lead fragments, casings, and other debris.
          9. No drive cables or pulleys to break or replace.
          10. No bulky and noisy drive motors above the shooters head.
          11. No track mounted power feed rails or wires to be impacted and damaged.
          12. Closed track design so brass and debris does not interfere with target operation.
          13. Includes 3/8 inch (9.5 mm) AR500 Front Armor Plate Prow.
          14. Uses batteries with a positive locking battery connection and ergonomic battery placement and replacement.
          15. New charging and docking system improved contact design for faster and more reliable charging.
          16. Programmable distraction lighting integrates red, blue, and white LED target lighting, with muzzle flash simulation.
          17. Chassis features a side cover designed for wheel overhead protection and the prevention of brass drivetrain damage.
          18. Anti-static wheels eliminate the need for grounding hardware and reduces ESD challenges.
    3. Basis of Design: XCT Monorail /Non-Turning Target Retrieval System as manufactured and supplied by InVeris Training Solutions.
       1. Description: Operates on an overhead monorail track, allowing smooth and rapid transport of the target up or down range in increments of feet, yards, or meters.
       2. Carrier Size (LxWxH): 21 x 6 x 7.25 inches (533 x 152 x 184 mm).
       3. Prow Angle: 30 degrees, ensures long life.
       4. Power Source: 120 VAC 60 HZ, 3 AMP, steady state.
       5. Drive Motor: 115/230 VAC 60 HZ, 1725 rpm, 1/4 HP.
       6. Carrier Speed: 5 ft (1524 mm) per second
       7. Resistive Touch Screen Control Panel: 4.3 inch (109 mm), resolution 480 x 272 pixels.
       8. Features:
          1. Operated via touchscreen controller at the firing line.
          2. Target carrier may be stopped at any distance from the firing line through the tablet by one of two control methods.
          3. Formed steel monorail track provides a stable platform for target transport.
          4. Durable, low profile target carrier with armored front plate made with 3/8 inch (9.5 mm) AR500 steel facing the shooter to limit damage from bullet impacts.
          5. Enclosed drive unit offers easy accessibility to motor components.
          6. Target holders attached to the target carrier for interchangeable offhand, kneeling, and prone shooting, and differing types of targets.
          7. Suitable for handguns, submachine guns, and shotguns to allow a full spectrum of training and usage by customers.
          8. Capable of holding bull's eye to full-size police silhouette targets.
  1. AUDIO AND VISUAL COMMUNICATION SYSTEMS

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Digital Audio / Video Remote Station as manufactured and supplied by InVeris Training Solutions.
       1. Description: Allows the range operator to call, listen, and converse with an individual shooter, a select group, or all shooters in unison by simply pressing the selector button on the master station. The operator can view the shooter via a video feed, allowing real-time feedback and response time for calls to master control.
       2. Master Station Console: Contains a video monitor, multi-channel selection panel, a talk or listen release switch, and an all-call button and volume controls for outgoing and incoming communications.

\*\* NOTE TO SPECIFIER \*\* Delete audio options not required.

* + - 1. Audio: Open voice speaker.
      2. Audio: Handset to provide listening privacy and diminish background noise.
      3. Video: Terminal is mounted to the stall for receipt and transmission of visual and voice communications.
         1. Casing: Stainless steel.
         2. Video Eye: 180-degree video projection.
      4. Call tone alerts the shooter of a transmission from the range operator, and the shooter responds simply by speaking.
      5. Shooter momentarily depresses the call button on the terminal to contact the range operator.
      6. Features:
         1. Ability to mix and match up to 11 components to create a customized communication solution.
         2. Viewing visitors with CCTV cameras while speaking through the intercom.
         3. Hands-free communication and push-to-talk operation for ease and simplicity.
         4. LED lights and call tones at the master station specify which door or sub-station is calling.
         5. Option to call one station at a time or call all stations at once.
         6. Announcements can be heard throughout your facility with installation of indoor or outdoor speakers.
    1. Basis of Design: Remote Audio Communication as manufactured and supplied by InVeris Training Solutions.
       1. Description: Allows the range operator to call, listen, and converse with an individual shooter, a select group, or all shooters in unison by simply pressing the selector button on the master station. The operator can view the shooter via a video feed, allowing real-time feedback and response time for calls to master control.
       2. Master Station Console: Contains a channel selection panel, a talk or listen release switch, and an all-call button and volume controls for outgoing and incoming communications.

\*\* NOTE TO SPECIFIER \*\* Delete audio options not required.

* + - 1. Audio: Open voice speaker.
      2. Audio: Handset to provide listening privacy and diminish background noise.
      3. Call tone alerts the shooter of a transmission from the range operator, and the shooter responds simply by speaking.
      4. Shooter momentarily depresses the call button on the terminal to contact the range operator.
      5. Channels: 10/20/30/40
      6. Features:
         1. Ability to mix and match up to 11 components to create a customized communication solution.
         2. Viewing visitors with CCTV cameras while speaking through the intercom.
         3. Hands-free communication and push-to-talk operation for ease and simplicity.
         4. LED lights and call tones at the master station specify which door or sub-station is calling.
         5. Option to call one station at a time or call all stations at once.
         6. Announcements can be heard throughout your facility with installation of indoor or outdoor speakers.
  1. RANGE CONTROLS

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: RangeMaster 9000, RM9K as manufactured and supplied by InVeris Training Solutions.
       1. Description: An easy to use range control system offering instructors and range personnel the ability to write, store and run training scenarios. These scenarios can also be downloaded to the individual control units at the firing line or to another controller.
       2. Features:
          1. Scenario files are easily retrieved and launched, with vivid display of real time range target conditions.
          2. Targets are directed to initiate a command to travel, conceal, expose, or edge.
          3. Displays all target locations, presentations, and other optional features via icons of changing colors and images on the computer screen.
          4. Targets are shown in increments of feet, yards, or meters.
          5. Can control any, all, or a combination of lanes with the simple click of the mouse with our Lane Manager software.
          6. Displays the status of all lane ICU batteries on a single page and delivers a pop-up on the browser if the lane battery gets low.
          7. Sets a time limit on the lane ICU. A configurable countdown timer flashes when remaining time drops below five minutes.
          8. Displays a pop-up on the Lane Manager page when lane time drops below the five-minute limit.
          9. Triggers the ICU into lock-down mode when time runs out, only allowing the carrier to come home.
          10. Displays a Help button on the ICU, enabling a pop-up notification display. The Help notification can be enabled or disabled.
          11. Turns on a light above the shooter's booth when the Help button is enabled. This light is controlled via a Wi-Fi enabled smart switch.
          12. Works in administrative mode, allowing the range operator to reboot the ICU's individually or all ICU's simultaneously and upgrade the ICU firmware individually or all ICU's simultaneously.
    2. Basis of Design: RangeMaster 10K, RM10K as manufactured and supplied by InVeris Training Solutions.
       1. Description: Combines advanced wireless and touch screen technologies for convenience and flexibility in range control operations.
       2. Features:
          1. Complete system control is managed through portable tablet computers, allowing personnel to leave the control room while maintaining complete control of the range.
          2. The control and portability equate to increased productivity, as range instructors devote attention to firearms instruction rather than range management from the confines of a control room.
          3. Touchscreen controller utilizes the latest technology in an intuitive, easy-to-navigate manner.
          4. Range personnel may choose from multiple options on one screen, including the menu bar, target commands and arrangement.
          5. Accepted commands include friend, foe, and edge.
          6. Random commands direct the target to present a complete, unexpected turn to the right or left, in increments of up to 360 degrees, allowing for real life scenarios and enhanced target training.
  1. MOBILE RANGES

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: Road Range as manufactured and supplied by InVeris Training Solutions.
       1. Description: A self-contained mobile firearms training facility that integrates live-fire and virtual simulation capabilities to provide a total weapons training solution in a transportable environment.
       2. Trailer:

\*\* NOTE TO SPECIFIER \*\* Delete configuration options not required.

* + - * 1. Configuration: Three-lane shooting range built inside an over-the-road 53 ft trailer that is USDOT certified for use on all unrestricted roads.
        2. Configuration: Side-by-side, six shooting lanes; operates as one range or as two separate, three-position ranges.
        3. Configuration: End-to-end, three shooting lanes; units combined end-to-end; 75 ft distance.
        4. Power: Standard electrical connections
        5. Power: Built-in generator.
        6. Interior: Designed with a range-control room separated from the shooting range, creating an airlock entrance vestibule between the shooting range and the exterior of the trailer to help maintain range ventilation
        7. Each area has independent HVAC and lighting systems.
        8. Dividing wall has the same ballistic capabilities as the shooting range.
      1. Bullet Trap: GranTrap.
      2. Shooting Stalls: Clear-View Shooting Stalls.
      3. Security System: Photoelectric system for indiscriminate movement forward of the line. A violation will trigger an alarm to alert all range occupants of the intrusion and automatically edge the targets and halt further target movement.
      4. Target System: XWT Gen 4.
      5. Range Control: RangeMaster 9000.
      6. Control Room: Allows range operator full control of the Road Range and all components.
         1. An audio system allows the range operator to communicate with the shooters and the ballistic glass window provides the operator with a visual view of the firing line and range.
         2. Controls for the target system, firing line security system, target and general lighting, ventilation systems, and generator are all easily accessible to the range operator.
         3. A heating and cooling unit in the control room provides a comfortable climate-controlled environment for the range operator.
      7. Ventilation System: 100 percent outside air system.
         1. Outside air is drawn in and transformed into laminar airflow to produce an average 75 fpm (0.38 mps) airflow across the firing line.
         2. The exhaust air is filtered through two stages of filtration with a final stage of 99.97 percent HEPA filtration before being safely discharged.
      8. Electrical System:

\*\* NOTE TO SPECIFIER \*\* Delete power options not required.

* + - * 1. Power: Standard electrical connections
        2. Power: Built-in generator, 20 KW power supply with fuel capacity for 30 hours of run time.
        3. Input Power: 208 60 Hz 3 phase.
        4. Input Power: 220 V single phase, 60 Hz.
        5. Input Power: 220 V 50 Hz.
        6. Lighting includes switched fixtures for general and service lighting at the firing line and target areas, and dimmable fixtures for target lighting arranged in banks for target exposure distance.
        7. Operator room has both general lighting and dimmable track-lighting fixtures, and an exterior fixture above the stairs at the trailer entrance.
      1. Ballistics: Wall and floor lining performance:

\*\* NOTE TO SPECIFIER \*\* Delete performance options not required.

* + - * 1. Maximum Bullet Velocity: 2000 ft per sec (610 m per sec).
        2. Maximum Bullet Velocity: 3600 ft per sec (1097 m per sec).
        3. Maximum Bullet Energy: 2200 ft-lbs (2983 Nm).
        4. Maximum Bullet Energy: 3600 ft-lbs (4881 Nm).
      1. Acoustic Material:
         1. Compliant with ASTM E-84 Class 1 flammability requirements and UL 1715 corner burn test
         2. Passes UL 94.
         3. Passes ASTM G 21 for fungus resistance and UL 121 for microbial growth.
         4. Sound Absorption Coefficients per ASTM C423.
      2. Floor Material:
         1. Density: 50 lbs per cu ft (80 kg per cu meter).
         2. Tensile Strength: 160 psi (1103 kPa).
         3. Elongation: Greater than 160 percent.
         4. Complies with ASTM D 2859 flammability requirements and has a flash point greater than 650 degrees F (343 degrees C).
      3. Included Optional Systems:

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

* + - * 1. Power generator.
        2. HVAC recirculation system.
        3. Infrared heaters.
        4. Split jacks.
        5. HEPA vacuum system.
      1. Features:
         1. Ballistically secure trailer range is equipped with systems and components to produce a three position, state-of- the-art, live-fire range.
         2. Can be customized to provide training for less lethal and non-lethal options such as verbal commands, baton, chemical spray, and TASER.
         3. Provides a comprehensive solution for marksmanship, sustainment and judgmental training including force escalation/de-escalation, use of force and shoot/no shoot training.
  1. SHOOT HOUSES

\*\* NOTE TO SPECIFIER \*\* Delete basis of design options not required.

* + 1. Basis of Design: SHOTT House as manufactured and supplied by InVeris Training Solutions.
       1. Description: Provides a tactical environment for critical skills training.
       2. Users can experience forced entry, room navigation, dynamic and covert clearing, team tactics and judgmental shoot or do not shoot engagements.

\*\* NOTE TO SPECIFIER \*\* Delete configuration options not required.

* + - 1. Configuration: Fixed.
      2. Configuration: Modular.
      3. Ballistics: Realistic 5 inch (127 mm) thick shoot house walls create authentic house dimensions and doorways similar to real world construction.
         1. Ballistic rubber facing eliminates ricochet, splatter, bounce back, and filters dust, creating a cleaner and safer shooting environment.
         2. Facing tiles can be individually replaced anywhere in the wall in approximately 15 minutes, with no need to remove timeworn adhesive or wait for new adhesive to cure.
         3. Ballistic rubber panels are molded to overlap at the seams, eliminating gaps between rubber panels that expose the AR steel plate behind.
      4. Features:
         1. Live-fire target systems.
         2. Virtual simulation.
         3. After action review.
         4. Lead dust and bullet fragments are captured and contained within the walls for later removal.
         5. Every wall has a removable lower panel for bullet fragment clean out, preventing lead bulge and build up, and aiding in fragment recycling efforts.
         6. Customized to meet the requirements of the user; fixed or modular construction allows for large or small rooms and a variety of room configurations.
         7. System is easily assembled on any flat, stable surface.
         8. Walls are constructed of AR 500 rated steel panels for maximum safety and long-term durability.
         9. Option of ballistic ceiling installation for additional security and protection.
         10. Closed-circuit cameras viewable in the master control room, allowing for fully reviewable, after action analysis.
      5. Prepares users for:
         1. Urban incidents.
         2. SWAT training.
         3. Individual and team tactics.
         4. Forced entry.
         5. Dynamic and covert clearing.
         6. Live-fire threat engagement.
         7. Hallway and stairway navigation.
         8. Low light or no light operations.
      6. Included Options:

\*\* NOTE TO SPECIFIER \*\* Delete options not required.

* + - * 1. Ballistic ceiling.
        2. Overhead catwalks for observation and evaluation of trainee capabilities.
        3. Live targetry.
        4. Virtual target systems.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until exterior locations, structure and installing surfaces have been properly prepared.
      2. Verify that all supports, and other adjoining conditions have been installed and prepared in accordance with the Drawings.
      3. If structure and installing surfaces preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   3. INSTALLATION
      1. Install all equipment in accordance with manufacturer's instructions.
      2. Equipment shall be assembled entirely by mechanical fasteners. No on-the-job cutting or welding is permitted.
      3. Equipment shall be mounted to the floor or suitable concrete surfaces as shown on the Drawings.
      4. All metal parts not otherwise finished shall be primed or painted.
   4. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
  1. ADJUSTING
     1. Test the functionality of all control systems, safety systems, target systems and control systems.
     2. Correct any deficiencies and replace any equipment not operating as required.
  2. CLEANING AND PROTECTION
     1. Clean products in accordance with the manufacturer's recommendations.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION