SECTION 07 72 00

ROOFTOP FALL PROTECTION AND ACCESSORIES

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\*\* NOTE TO SPECIFIER \*\* Kee Safety, Inc.; pipe railing fittings, safety railing systems, deadweight anchor systems, skylight fall protection, horizontal lifeline systems.  
This section is based on the products of Kee Safety, Inc., which is located at:  
100 Stradtman St.  
Buffalo, NY 14206  
Toll Free Tel: 800-851-5181  
Tel: 716-896-4949  
Fax: 716-896-5696  
Email: [request info (info@keesafety.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Kee+Safety,+Inc.&coid=33541&rep=&fax=716-896-5696&message=RE:%20Spec%20Question%20(07720ksi):%20%20&mf=)  
Web: <http://keesafety.com> | <http://keesafety.ca>   
 [ [Click Here](https://www.arcat.com/arcatcos/cos33/arc33541.html) ] for additional information.  
Kee Safety is the world's leading fall protection expert. We engineer, manufacture, supply and install Fall Protection Systems that safely separate people from hazards. Since 1934, Kee Safety has provided versatile, economical, and durable safety railing components and modular systems that consistently meet OSHA compliance on rooftop applications and ground-based installations. Kee Safety products are third-party tested and trusted to ensure consistent performance at the highest level.

1. GENERAL
   1. SECTION INCLUDES
      1. Steel safety rail components. (KEE KLAMP)
      2. Aluminum Safety Railings.(KEE LITE)
      3. Steel ADA Safety Railing Components. (KEE KLAMP ACCESS RAILING)
      4. Safety Railing Kits. (KEE KWIK)
      5. Free-standing rooftop fall protection systems. (KEE GUARD)
      6. Free-standing rooftop fall protection systems. (KEE GUARD CONTRACTOR)
      7. Fixed Rooftop Fall Protection Systems. (KEE GUARD TOPFIX)
      8. Rooftop hatch safety railing systems. (KEE HATCH)
      9. Collective free-standing skylight guardrail systems. (KEE DOME)
      10. Skylight protection screens. (KEE COVER)
      11. Safety gates. (KEE GATE)
      12. Pallet gates. (KEE PIVOT)
      13. Rooftop walkway systems. (KEE WALK)
      14. Rooftop safe access platform systems. (KEE STEP)
      15. Deadweight anchor systems. (KEE ANCHOR)
      16. Horizontal lifeline systems. (KEE LINE)
      17. Overhead track fall protection systems. (KEE TRACK)
      18. Single rigid anchors fall protection systems. (KEE POST)
      19. Free-standing warning line systems. (KEE MARK)
   2. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications.

\*\* NOTE TO SPECIFIER \*\* Roof Edge Protection and Roof Hatch protection only. Delete if not required.

* + 1. Section 07 42 00 - Wall Panels.
  1. REFERENCES

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

* + 1. Americans with Disabilities Act Accessibility Guidelines (ADA).
    2. American Society of Civil Engineer (ASCE):
       1. ASCE 7-16 - Minimum Loads and Associated Criteria for Buildings and Other Structures.
    3. ASTM International (ASTM):
       1. ASTM A47 - Standard Specification for Ferritic Malleable Iron Castings.
       2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
       3. ASTM A123 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
       4. ASTM A500 - Standard Specification for cold-formed welded and seamless carbon steel structural tubing.
       5. ASTM B221 - Standard Specification for Aluminum and Aluminum Alloy extruded bars, rods, wires, profiles, and tubes.
    4. Occupational Safety and Health Administration (OSHA):
       1. OSHA 1910.29 - Fall Protection systems and falling object protection.
       2. OSHA 1926.502 - Fall Protection systems criteria and practices.
    5. Underwriters Laboratories (UL): UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. 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.
     3. Shop Drawings: Including but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each system specified, two complete sets of color chips representing manufacturer's full range of available finishes.
    2. Verification Samples: For each system specified, two samples, minimum size 6 inches (150 mm) long, representing actual system components and finishes.
  1. QUALITY ASSURANCE

\*\* NOTE TO SPECIFIER \*\* For aluminum and steel railing systems. Delete if not required.

* + 1. Railings Structural Requirements:

\*\* NOTE TO SPECIFIER \*\* The following are typical structural requirements for rails. Modify the location of your project if required by code or other authorities.

* + - 1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 lbs (90,719 g) applied horizontally or vertically down at any point on the top rail.
      2. Handrail assemblies and guards shall be designed to resist a load of 50 lbs per linear ft (0.73 kN per m) applied in any direction at the top and to transfer this load through the supports to the structure.

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

* + - 1. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 lbs (90,719 g) applied to 1 sq ft (8165 g per sq m) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Install in areas designated by Architect.
       2. Do not proceed with remaining work until workmanship and installation are approved by the Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Deliver, Store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer.
        1. Materials to be delivered to the job site in good condition and adequately protected against damage as handrails are a finished product.
        2. Store products in manufacturer's unopened packaging until ready for installation.
        3. Protect finishes from damage.
  2. PROJECT CONDITIONS
     1. 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.
     2. Field Measurements: Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
        1. Where field measurements cannot be made without delaying the railing fabrication and delivery, obtain guaranteed dimensions in writing by the Contractor and proceed with fabrication of products to not delay fabrication, delivery, and installation.
     3. Coordinate fabrication and delivery schedule of handrails with construction progress and sequence to avoid delay of railing installation.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Kee Safety, Inc., which is located at: 100 Stradtman St.; Buffalo, NY 14206; Toll Free Tel: 800-851-5181; Tel: 716-896-4949; Fax: 716-896-5696; Email: [request info (info@keesafety.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Kee+Safety,+Inc.&coid=33541&rep=&fax=716-896-5696&message=RE:%20Spec%20Question%20(07720ksi):%20%20&mf=); Web: <http://keesafety.com> | <http://keesafety.ca>

\*\* 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 the provisions of Section 01 60 00 - Product Requirements.

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

* 1. SAFETY RAILINGS PERFORMANCEAND DESIGN REQUIREMENTS
     1. Performance and Design Requirements: Pipe and tube railing and guardrail design.
        1. Comply with the following:
           1. International Building Code/International Code Council.
           2. OSHA Standard Pipe Railing: 1910.29 Fall Protection systems and falling object protection.
           3. Local code requirements by authorities having jurisdiction.
        2. Delegated Design: Railing design is to be the responsibility of a professional engineer, licensed in the same location as the project. See Section 01 40 00 - Quality Requirements0 "Quality
        3. Requirements," for more detailed information.
        4. Structural Performance: Railings and Attachments: Withstand effects of gravity loads and the following loads as specified.
           1. Recommended Maximum Post Spacing: 72 inches (1829 mm).
           2. Minimum Height: 42 inches (1067 mm).
           3. Intermediate Rail Height: 21 inches (533 mm).
           4. Toe Board:

Height: 4 inches (102 mm). 1/4 inch (6 mm) or less above the floor.

Required wherever, beneath open sides, persons can pass, there is moving machinery, or there is equipment with which falling materials could create a hazard.

* + - * 1. Handrails and Top Rail of Railing Systems:

Uniform Load: 50 lbf per ft. (0.73 kN per m) in any direction.

Concentrated Load: 200 lbf (0.89 kN) in any direction.

Uniform and concentrated loads need not be assumed to act concurrently.

* + - * 1. Infill: Guarding for railing systems:

Concentrated Load: 50 lbf (0.22 kN) applied horizontally on an area of 1 sq ft (0.093 sq m).

Infill load and other loads need not be assumed to act concurrently.

Infill Height: IBC 1003.2.

Not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent seat board.

Openings Limitations: IBC 1015.4.

Open infill shall have balusters or ornamental patterns such that a 4-inch (102 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm).

From height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Where Required: IBC.

Infill: Along open-sided walking surfaces, mezzanines, industrial equipment platforms, stairways, ramps, and landings more than 30 inches (762 mm) above the floor or grade below.

Adequate in strength and attachment in accordance with Section 1607.9.

* + - 1. Allow expansion and contraction due to thermal movements caused by temperature changes.

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

* 1. STEEL SAFETY RAILINGS COMPONENTS - KEE KLAMP
     1. Basis of Design: KEE KLAMP Components and Pipe as manufactured by Kee Safety. Slip-on components to create versatile and rigid tubular system structures. The product line provides the versatility needed to achieve any structure configuration.
        1. Handrails and guardrails.
        2. Roof hatch guardrails.
        3. Safety barriers.
        4. Roof edge protection.
     2. Performance and Design Requirements: Safety Railing Components: KEE KLAMP.
        1. Fittings: Iron castings manufactured to ASTM A47-77-32510 Requirements.
           1. Hot Dipped Galvanized: ASTM A123.
        2. Fittings Range: Eight different pipe sizes from 1/4 to 2 inches (6 to 51 mm).
        3. Hexagon Set Screws; Firmly lock components to pipes.
           1. Case hardened steel and protected against corrosion.
           2. Corrosion Protection: KEE KOAT as manufactured by KEE SAFETY.
        4. Fittings Sizes 5 to 9:
           1. Axial Load: Supports 2000 lbs (907 kg) per set screw tightened to 29 ft-lbs (39.3 N-m) torque.

Safety factor of 2:1.

Required Torque: Normally obtained when set screws are tightened using a ratchet wrench.

* + 1. Components: KEE KLAMP.
       1. Fittings, Brackets, Flanges, and Anchors: Cast or formed metal of same material and finish as supported rails. Surfaces: Smooth. No seams, marks, trade names, or discolorations.
       2. Fittings by Function:
          1. Bases.
          2. Clips.
          3. Couplings.
          4. Crosses.
          5. Crossovers.
          6. Elbows.
          7. Flanges.
          8. Swivel Sockets.
          9. Tab Panels.
          10. Tees and Sockets.
          11. Plugs.
          12. Miscellaneous.
    2. Material for Posts and Railings: KEE KLAMP.
       1. Galvanized Steel Pipe or Tube: Nominal mill lengths of 21 feet (6.400 m). Galvanized steel tubing can be used, providing the outside diameter is compatible with Schedule 40 pipe. Pipe with a wall thickness of less than 1/8 inches (3.17 mm) can only be used in lightly loaded structures.
          1. Pipe: Schedule 40 ASTM A53.
          2. Pipe: Schedule 80 ASTM A53.
          3. Tubing: ASTM A500 or ASTM A513.
          4. Galvanizing: ASTM A123.
          5. Nominal Pipe Size: 1/4 inch (6 mm). Outside Dia: 0.54 inches (13.7 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 2.

* + - * 1. Nominal Pipe Size: 3/8 inch (10 mm). Outside Dia: 0.67 inches (17 mm).

Tubing Outside Dia: 0.688 inches (17.47 mm).

KEE Component Size: 3.

* + - * 1. Nominal Pipe Size: 1/2 inch (13 mm). Outside Dia: 0.84 inches (21.3 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 4.

* + - * 1. Nominal Pipe Size: 3/4 inch (19 mm). Outside Dia: 1.05 inches (26.7 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 5.

* + - * 1. Nominal Pipe Size: 1 inch (25 mm). Outside Dia: 1.31 inches (33.3 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 6.

* + - * 1. Nominal Pipe Size: 1-1/4 inch (32 mm). Outside Dia: 1.66 inches (42.2 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 7.

* + - * 1. Nominal Pipe Size: 1-1/2 inch (38 mm). Outside Dia: 1.90 inches (48 mm) .

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 8.

* + - * 1. Nominal Pipe Size: 2 inch (51 mm). Outside Dia: 2.37 inches (60.2 mm).

Tubing Outside Dia: 0.531 inches (13.49 mm).

KEE Component Size: 9.

* + - * 1. Finish: Powder Coating: Durable, corrosion preventing polyester coating applied to already galvanized or anodized products available in any RAL color.

Color: As determined by the Architect .

* + - * 1. Finish: Antimicrobial Powder Coating: Defends against the growth of potentially harmful invisible bacteria and fungi. Supplied in a wide range of RAL colors.

Color: As determined by the Architect.

* + 1. Accessories:
       1. Anti-theft Aluminum Drive Rivets.
       2. Toe Board.
       3. Safety Spring Gate.
       4. In-Fill Panels.
       5. Grip Tape.
       6. High Traction Covers.
       7. High Traction Stair Covers.
       8. High Traction Ladder Rung Covers.

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

* 1. ALUMINUM SAFETY RAILINGS COMPONENTS - KEE LITE
     1. Basis of Design: KEE LITE Components and Pipe as manufactured by Kee Safety. Slip-on components to create versatile and rigid tubular system structures. The product line is to provide the versatility needed to achieve any structure configuration.
        1. Handrails and guardrails.
        2. Roof hatch guardrails.
        3. Safety barriers.
        4. Roof edge protection.
     2. Performance and Design Requirements: Safety Railing Components: KEE LITE.
        1. Fittings: High grade Aluminum Silicon Magnesium Alloy Fittings or Castings conforming to ASTM A356 T-6.
        2. Fittings Range: Eight different pipe sizes from 3/4 to 2 inches (19 to 51 mm).
        3. Hexagon Set Screws; Firmly lock components to pipes.
        4. Fittings Sizes 5 to 9:
           1. Axial Load: Supports 2000 lbs (907 kg). per set screw tightened to 29 ft-lbs (39.3 N-m) torque.

Safety factor of 2:1.

Required Torque: Normally obtained when set screws are tightened using a ratchet wrench.

* + 1. Components: KEE LITE.
       1. Fittings, Brackets, Flanges, and Anchors: Cast or formed metal of same material and finish as supported rails. Surfaces: Smooth. No seams, marks, trade names, or discolorations.
       2. Fittings by Function:
          1. Bases.
          2. Couplings.
          3. Crosses.
          4. Crossovers.
          5. Elbows.
          6. Flanges.
          7. Handrail Wall Bracket.
          8. Plugs.
          9. Swivel Sockets.
          10. Tees and Sockets.
          11. Toe Board Kits.
          12. Miscellaneous.

\*\* NOTE TO SPECIFIER \*\* When Kee Lite fittings in sizes 7, 8, 9 are used to construct a inch (1067 mm) high guard railing, the railing will meet the requirements of the OSHA design standard of a single 200 lbs (90.7 kg) load applied at any location along the top rail when the correct specification of pipe is used, and the correct method of design is employed. The integrity of the structure to which the system is secured, and the hardware used will also need to be checked to ensure they are capable of meeting the imposed load requirements (reference OSHA 29 CFR 1910.23). Please contact Kee safety for design assistance.

* + 1. Material for Posts and Railings: KEE LITE.
       1. Aluminum Pipe: Alloy 6061-T6 conforming to ASTM B221.
          1. Nominal Mill Length: 12 feet (3.658 m).
          2. Nominal Mill Length: 24 ft (7.315 m).
          3. Pipe: Schedule 40 ASTM B221.
          4. Pipe: Schedule 80 ASTM B221.
          5. Finish: Anodized.

Color: As determined by the Architect.

* + - * 1. Nom. Pipe Size: 3/4 inch (19 mm). Outside Dia: 1.050 inches (26.67 mm).

KEE Component Size: 5.

* + - * 1. Nom. Pipe Size: 1 inch (25 mm). Outside Dia: 1.315 inches (33.40 mm).

KEE Component Size: 6.

* + - * 1. Nom. Pipe Size: 1-1/4 inch (32 mm). Outside Dia: 1.660 inches (42.26 mm).

KEE Component Size: 7.

* + - * 1. Nom. Pipe Size: 1-1/2 inch (38 mm). Outside Dia: 1.900 inches (48.26 mm).

KEE Component Size: 8.

* + - * 1. Nom. Pipe Size: 2 inch (51 mm). Outside Dia: 2.375 inches (60.32 mm).

KEE Component Size: 9.

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

* 1. STEEL ADA SAFETY RAILINGS COMPONENTS - KEE KLAMP ACCESS
     1. Basis of Design: KEE KLAMP Components and Pipe as manufactured by KEE Safety. Slip-on components to create versatile and rigid tubular system structures. The product line with handrail height of 34" - 38" and guardrail height of 42"is designed to satisfy the requirements of the Americans with Disabilities Act (ADA), as well as state and local building codes.
     2. Performance and Design Requirements: Safety Railing Components: KEE KLAMP.
        1. Fittings: Iron castings manufactured to ASTM A47 Requirements.
           1. Hot Dipped Galvanized: ASTM A123.
        2. Hexagon Set Screws; Firmly lock components to pipes.
           1. Case hardened steel and protected against corrosion.
           2. Corrosion Protection: KEE KOAT as manufactured by KEE SAFETY.
        3. Axial Load: Supports 2000 lbs (907 kg) per set screw tightened to 29 ft-lbs (39.3 N-m) torque.
           1. Safety factor of 2:1.
           2. Required Torque: Normally obtained when set screws are tightened using a ratchet wrench.
     3. Components: KEE KLAMP.
        1. Fittings, Brackets, Flanges, and Anchors: Cast or formed metal of same material and finish as supported rails. Surfaces: Smooth. No seams, marks, trade names, or discolorations.
        2. Fittings by Function:
           1. Couplings.
           2. Elbows.
           3. Flanges.
           4. Handrail Wall Bracket.
           5. Tees and Sockets.
     4. Material for Posts and Railings: KEE KLAMP.
        1. Galvanized Steel Pipe: Nominal mill lengths of 21 feet (6.4 m).
           1. Pipe: Schedule 40 ASTM A53.
           2. Nom. Pipe Size: 1-1/4 inch (32 mm). Outside Dia: 1.660 inches (42.16 mm).
           3. Finish: Powder Coating: Durable, corrosion preventing polyester coating applied to already galvanized or anodized products available in any RAL color.
           4. Finish: Antimicrobial Powder Coating: Defends against the growth of potentially harmful invisible bacteria and fungi. Supplied in a wide range of RAL colors.

Color: As determined by the Architect .

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

* 1. SAFETY RAILING KITS (KEE KWIK)
     1. Basis of Design: KEE KWIK KIT safety railing kits as manufactured by Kee Safety Inc.
        1. Provide components including but not limited to pipe, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
        2. Compliance: Safety barrier system with 42 inches (1067 mm) height to provide a pedestrian egress barrier to withstand a minimum load of 200 lbs (90.718 kg) in any direction to components per OSHA Regulation 29 CFR 1910.29.
        3. Fabrication: Preassembled upright modules.
        4. Pipe: 1.90 inches (48 mm) Outside Diameter.
        5. Rails and Posts: Safety yellow powder coated finish.
        6. Fittings: Galvanized malleable cast iron, ASTM A 47 with ASTM A123 galvanizing.
        7. Fasteners: Type 304 or 305 stainless steel.
        8. Post Spacing: 72 inches (1829 mm).

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

* + - 1. Type: Steel kit, Kwik SC Steel Corner Kit.
         1. Description: Contains 3 pre-assembled 42 inch (1067 mm) uprights and 4 horizontal rails; 3 standard railing base flanges, 2 ninety degree elbows, 2 single socket tees, 1 side outlet elbow, and 1 ninety degree side outlet tee.
      2. Type: Steel kit, Kwik SE Steel Extension Kit.
         1. Description: Contains 1 pre-assembled 42 inch (1067 mm) upright and 2 horizontal rails; 1 standard railing base flange, 1 three socket tee, and 1 two socket cross.
      3. Type: Steel kit, Kwik SS Steel Straight Kit.
         1. Description: Contains 3 pre-assembled 42 inch (1067 mm) upright and 2 horizontal rails; 1 standard railing base flange, 1 three socket tee, and 1 two socket cross.
      4. Type: Aluminum kit, Kwik AC Aluminum Corner Kit.
         1. Description: Contains 3 pre-assembled 42 inch (1067 mm) uprights and 4 horizontal rails; 3 standard railing base flanges, 2 ninety degree elbows, 2 single socket tees, 1 side outlet elbow, and 1 ninety degree side outlet tee.
      5. Type: Aluminum kit, Kwik AE Aluminum Extension Kit.
         1. Description: Contains 1 pre-assembled 42 inch (1067 mm) upright and 2 horizontal rails; 1 standard railing base flange, 1 three socket tee, and 1 two socket cross.
      6. Type: Aluminum kit, Kwik AS Aluminum Straight Kit.
         1. Description: Contains 3 pre-assembled 42 inch (1067 mm) upright and 2 horizontal rails; 1 standard railing base flange, 1 three socket tee, and 1 two socket cross.

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

* 1. FREE-STANDING ROOFTOP FALL PROTECTION SYSTEMS (KEE GUARD)
     1. Free-Standing Rooftop Edge Fall Protection Systems: Kee Guard as manufactured by Kee Safety Inc. Does not penetrate the roofing system. Systems do not require physical fixing into the roof's structure/membrane. The complete system's design, manufacture, testing and installation has been externally assessed.
        1. Permanent, modular, free-standing, roof edge fall protection railing system for areas where regular access for maintenance and inspection is required.
        2. Components include but are not limited to pipe railings, uprights, bases, counterweights, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
        3. Compliance:
           1. Testing and Certification:

OSHA Standard 29 CFR 1910.29 (B) (1); (B) (3).

42 inch (1067 mm) minimum height providing a pedestrian egress barrier on the roof , withstanding a load of 200 lb. (90719 g).

OSHA Standard 29 CFR 1926.501 (b) (1); (b) (2) (ii).

OSHA Standard 29 CFR 1926.502 (B) (1) - (B) (14).

Canadian National Building Code 4.1.5.14

Ontario Building Code Section 4.1.5.14

California Building Code 1710A.3.1; 24 hour 400 lbs (181 kg) point load.

California Code of Regulations Title 8 Sections 3209 and 3294.

NF E85-003.

EN ISO 14122: PT3.

EN 13374 Class A.

EN 1991-1-4.

BS 13700 Permanent counterweighted guardrail systems - Specification.

BS 6399; Part 2 Code of Practice for Wind Code.

* + - * 1. Work at Height Regulations:

HSG-33 Health and Safety in Roof Work.

HSE Sheet 21 "Working on Flat Roofs Protection Against Falls."

EU Directives and CDM Regulations.

* + - * 1. Wind Loading:

Installations are to be wind speed calculated to ASCE 7 - The American Society of Civil Engineers design standard: "Minimum Design Loads for Buildings and Other Structures."

* + - * 1. BGV A1: 2000, BGG 928 & BGR 184.
        2. Health, Safety and Welfare Regulation 13 "Falls or Falling Objects."
        3. TUV Tested.
      1. Materials:

\*\* NOTE TO SPECIFIER \*\* Gatorshield® manufactured by Allied Tube & Conduit is a patented triple layer Flo-Coat® rust and corrosion resistant product which has shown itself to be the best over the long haul versus all competitive product offerings.

* + - * 1. Tubing: Gatorshield.

Tubing Cut On Site: Zinc rich paint is applied to the cut end of the tube.

* + - * 1. Base Metal: ASTM A500 Carbon Steel.
        2. Zinc Spelter - ASTM B6 High Grade Special High Grade Zinc.
        3. Chemical Composition per ASTM A-500.
        4. Material Testing - ASTM 500 and ASTM E8.
        5. Top Guardrails and Intermediate Rails: Steel. 1.9 inch (48.3 mm) external diameter.

Wall Thickness: 0.109 inches (2.77 mm).

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

Supplied Length: 21 ft (6.401 m).

Supplied Length: 10 ft 6 inches (3.2 m).

Supplied Length: 7 ft (2.134 m).

* + - * 1. Vertical Support Legs: Steel. 1.9 inch (48.3 mm) external diameter.

Wall Thickness: 0.109 inches (2.77 mm).

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

Leg Type: Vertical.

Leg Type: Raked.

Leg Type: Radiused.

Leg Type: Bent.

* + - * 1. Cantilever Tubes: Steel. 1.66 inch (42.2 mm) external diameter

Wall Thickness: 0.109 inches (02.77 mm).

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

Supplied Length: 42.32 inches (1075 mm).

Supplied Length: 62 inches (1575 mm).

Supplied Length: 10.23 inches (260 mm).

* + - * 1. Cast Clamps Used to Join the Guardrail: Galvanized malleable cast iron produced to ASTM A47 and galvanized to ASTM A123.

Tapped Holes: Protected with Threadkoat; applied to all tapped holes.

Grub Screws: Carbon steel and have KEE KOAT protection applied to ensure minimal maintenance.

Fittings:

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

Base Foot.

Base Foot with Toe Board accommodation.

90 degree Elbow.

Three Socket Tee Connector.

Saddle Clamp.

Adjustable Side Outlet Tee Elbow.

Straight Coupling.

Wall / Ladder Clamp.

Anchor Bolts. Stainless steel.

Collar.

Two Socket Cross.

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

Finish: Galvanized.

Powder coating - from a wide range of RAL colors

Color: As determined by the Architect.

* + - * 1. Counter Weights: Recycled PVC. Weight: 29 lbs 5 oz (13.3 kg).

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

* + - * 1. Access Gates: Kee Gate Standard Self-Closing Safety Gates. OSHA complaint. Gate Width Range: 16.5 to 50 inches (419 to 1270 mm). Spring loaded to close automatically. Supplied with U-bolts and fastener packs for secure, quick assembly to existing structures and posts.

Safety tested to 50,000 actuations.

Gate Height: 19.69 inch (500 mm).

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

Gate Width: 18 inches (457 mm).

Adjusts: 16.5 to 20 inches (419 to 508 mm).

Gate Width: 21 inches (533 mm).

Adjusts: 19.5 to 23 inches (495 to 584 mm).

Gate Width: 24 inches (610 mm).

Adjusts: 22.5 to 26 inches (571 to 660 mm).

Gate Width: 27 inches (686 mm).

Adjusts: 25.5 to 29 inches (648 to 737 mm).

Gate Width: 30 inches (762 mm).

Adjusts: 28.5 to 32 inches (724 to 813 mm).

Gate Width: 33 inches (838 mm).

Adjusts: 31.5 to 35 inches (800 to 889 mm).

Gate Width: 36 inches (914 mm).

Adjusts: 34.5 to 38 inches (876 to 965 mm).

Gate Width: 40 inches (1016 mm).

Adjusts: 38.5 to 42 inches (979 to 1067 mm).

Gate Width: 48 inches (1219 mm).

Adjusts: 46.5 to 50 inches (1181 to 1270 mm).

Material: Galvanized steel.

\*\* NOTE TO SPECIFIER \*\* If powder coating the guard rails, Delete finish options not required. Delete the following four paragraphs if plain galvanized steel is acceptable.

Finish - Powder coating from a wide range of RAL colors

Color: As determined by the Architect.

* + - * 1. Metal components in contact with the roof membrane are covered with 0.118 inch (3 mm) rubber.

\*\* NOTE TO SPECIFIER \*\* Delete option for toe boards if not required.

* + - * 1. Toe boards: No drilling required; upright hardware and splice kits for corners and straight sections as required for complete installation.
        2. Fasteners: Galvanized.
      1. Layout:
         1. Guardrail Height: 42 inches (1067 mm)/
         2. Vertical Support Spacing. A maximum 8 ft (2.438 m) Center-to-center depending on the system.
         3. Recycled PVC Counter Weights: Attached to each vertical leg set at no more than 8 ft (2.438 m) center-to-center.

Corner Support Legs: There is no need for a PVC Counter Weight to be connected.

* + - * 1. Stop Ends: Are appropriately counter weighted according to roof pitch and membrane or supported by way of a wall/ladder clamp.

\*\* NOTE TO SPECIFIER \*\* Delete system design not required.

* + - 1. System Design: Designed for applications with flat or low slope roofs up to 5 degrees.

\*\* NOTE TO SPECIFIER \*\* Delete roof type options not required, then delete slope options not required.

* + - * 1. Roof Type: Mineral Roof Grade:

Counterbalances: With one fixing collar per counterbalance.

For slopes up to 5 degrees:

End Counter Balance: CB7 - Seven Weight Counterbalance.

End Bay Length: 8 ft (2.438 m).

Second Vertical Leg Counter Balance: CB1 - One Weight Counterbalance.

Subsequent Counter Balances: CB1 - One Weight Counterbalance.

Subsequent Bay Length: 8 ft (2.438 m).

For slopes up to 5 degrees:

End Counter Balance: CB4 - Four Weight Counterbalance.

End Bay Length: 3 ft 3 inches (1 m).

Second Vertical Leg Counter Balance: CB3 - Three Weight Counterbalance.

Subsequent Counter Balances: CB1 - One Weight Counterbalance.

Subsequent Bay Length: 8 ft (2.438 m).

* + - * 1. Roof Type: TPO - Single Ply Membrane and EPDM - Single Ply Membrane.

Counterbalances: With one fixing collar per counterbalance.

For slopes up to 5 degrees:

End Counter Balance: CB7 - Seven Weight Counterbalance.

End Bay Length: 8 ft (2.438 m).

Second Vertical Leg Counter Balance: CB1 - One Weight Counterbalance.

Subsequent Counter Balances: CB1 - One Weight Counterbalance.

Subsequent Bay Length: 8 ft (2.438 m).

* + - 1. System Design: Designed for standing seam metal roof applications.
         1. Four S5 clamps depending on seam type bolted to galvanized steel baseplate and attached to standing seams with set screws without puncturing metal roof.
         2. Kee Klamp Type 62 base fitting affixes to metal baseplates to support uprights.
         3. Horizontal baseplates are custom fabricated to for standing seam metal roofs.

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

* + - * 1. Kee Klamp Type 69 fitting to accommodate a toe board.

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

* + - 1. System Configuration: As indicated on Drawings.
      2. System Configuration: KeeGuard 13 ft (3.962 m) Straight Guardrail Run.
      3. System Configuration: KeeGuard 16 ft 4 inch (4.978 m) Straight Guardrail Run.
      4. System Configuration: KeeGuard 21 ft (6.401 m) Straight Guardrail Run.
      5. System Configuration: KeeGuard 29 ft 4 inch (8.915 m) Straight Guardrail Run.
      6. System Configuration: KeeGuard 9 ft 10 inch (2.997 m) Straight Guardrail Run.
      7. System Configuration: Radiused System, length as indicated.

\*\* NOTE TO SPECIFIER \*\* Delete option for components not required.

* + - 1. Components: As scheduled and indicated on Drawings, as required to match design indicated on Drawings and as required to provide complete installation.
      2. Components:

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

* + - * 1. Upright Assembly: Type KGU135.
        2. Upright Assembly: Type KGU45.
        3. Counterweight Levers: Galvanized tube, 12 gauge, 1-1/4 inch (32 mm) nominal size.
        4. Mounting Bases: Galvanized steel with rubber pad on underside.

\*\* NOTE TO SPECIFIER \*\* Delete option for in-fill panels if not required.

* + - 1. In-fill Panels: Welded wire mesh; up to 48 inches (1219 mm) wide by 72 inches (1829 mm) long.

\*\* NOTE TO SPECIFIER \*\* Delete options for material, finish not required.

* + - * 1. Materials, Finish: Steel with galvanized finish.
        2. Materials, Finish: Steel with powder coated finish.

\*\* NOTE TO SPECIFIER \*\* Fill in blank below with RAL color designation as applicable. Delete options for color not required.

Color: \_\_\_\_\_\_\_\_\_\_\_\_.

Color: To match guardrail system.

Color: As indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete options for welded wire mesh size not required.

* + - * 1. Mesh Openings: Standard, 4 inches x 4 inches (102 mm x 102 mm).
        2. Mesh Openings: 2 x 2 inches (51 x 51 mm).
        3. Mesh Openings: 1 x 1 inches (25 x 25 mm).

\*\* NOTE TO SPECIFIER \*\* Delete option for in-fill panels if not required.

* + - 1. In-fill Panels: Custom materials, size and finish as indicated on Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete option for toe boards if not required.

* + - 1. Toe boards: No drilling required; upright hardware and splice kits for corners and straight sections as required for complete installation.

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

* 1. FREE-STANDING ROOFTOP FALL PROTECTION SYSTEMS (KEE GUARD CONTRACTOR)
     1. Free-Standing Rooftop Fall Protection Systems: KeeGuard Contractor as manufactured by Kee Safety Inc.
        1. Description: Portable, modular, free-standing, roof edge railing system that does not penetrate the roofing system.
        2. Provide components including but not limited to pipe railings, uprights, bases, weights, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
        3. Compliance:
           1. OSHA Standard 29 CFR 1910.29 (B) (1); (B) (3).

42 inch (1067 mm) minimum height to provide a pedestrian egress barrier on the roof to withstand a minimum load of 200 lbs (90719 g) in any direction to the top rail.

* + - * 1. OSHA Standard 29 CFR 1926.501 (b) (1); (b) (2) (ii).
        2. OSHA Standard 29 CFR 1926.502 (B) (1) - (B) (14).
        3. Canadian National Building Code 4.1.5.14
        4. Ontario Building Code Section 4.1.5.14
        5. Wind Loading: All installations are wind speed calculated to ASCE 7 - The American Society of Civil Engineers design standard: "Minimum Design Loads for Buildings and Other Structures."

\*\* NOTE TO SPECIFIER \*\* Delete system design not required.

* + - 1. System Design: Designed for applications with flat or low slope roofs up to 5 degrees.
         1. Bases: Produced in two halves.

Materials: 100 percent recycled PVC.

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

Weights: As indicated on Drawings.

Weights: Four in first bay and return.

* + - 1. System Configuration: As indicated on Drawings.
      2. Height of Guardrail: 42 inches (1067 mm).
      3. Vertical Supports: Set at maximum 10 ft centers.
      4. Each vertical support is inserted into the PVC Base. The leg is secured in place by tightening the collar inserted within the mold. All stop ends have returns or triple counter weighted, using standard KeeGuard components or supported by way of a wall/ladder clamp.
      5. Gatorshield Tubing:
      6. Base Metal: ASTM A500 Carbon Steel.
      7. Zinc Spelter - ASTM B6 High Grade Special High Grade Zinc.
      8. Chemical Composition - ASTM A500.
      9. Material Testing - ASTM-A500 and ASTM E8.
      10. Guardrail top and intermediate rails: 1.9 inch (48.3 mm) external diameter.
          1. Wall Thickness: 0.109 inches (2.77 mm).
      11. Vertical Support Legs: 1.9 inch (48.3 mm) external diameter.
          1. Wall Thickness: 0.109 inches (2.77 mm).
      12. Bases: Recycled PVC. Produced in two halves.
      13. Cast Clamps: Galvanized malleable cast iron produced to ASTM A47.
      14. Threadkoat applied to all tapped holes.
      15. Grub screws are carbon steel and have Keekoat protection applied to ensure minimal maintenance.
      16. When Tubing is Cut On Site: Apply zinc rich paint to the cut end of the tube.
      17. Safety Gates: Spring Loaded, self-closing safety gate for North America. Each model can be adjusted on site without need for cutting or welding. Complete with fixing pack.
          1. Material : Galvanized steel to ASTM A53.
          2. Finish: Powder coating from a wide range of RAL colors as specified by Architect
          3. Gate Width: 18 inches (457 mm).
          4. Gate Width: 21 inches (533 mm).
          5. Gate Width: 24 inches (610 mm).
          6. Gate Width: 27 inches (686 mm).
          7. Gate Width: 30 inches (762 mm).
          8. Gate Width: 33 inches (838 mm).
          9. Gate Width: 36 inches (914 mm).
          10. Gate Width: 40 inches (1016 mm).
          11. Gate Width: 48 inches (1219 mm).

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

* 1. FIXED ROOFTOP FALL PROTECTION SYSTEMS (KEE GUARD TOPFIX)
     1. Fixed Rooftop Fall Protection Systems: Kee Guard Topfix as manufactured by Kee Safety Inc.
        1. Description: Fixed, modular, free standing roof edge railing system for metal profile and standing seam roofs up to 45 degree pitch.
        2. Provide components including but not limited to pipe railings, uprights, bases, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.

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

* + - 1. Material: Galvanized steel.
      2. Material: Aluminum.
      3. Compliance:
         1. EN 14122 PT.3.
         2. EN 13374 CLASS A.
         3. BS 13700.
         4. OSHA Standard 29 CFR 1910.23.

42 inch (1067 mm) minimum height to provide a pedestrian egress barrier on the roof to withstand a minimum load of 200 lbs (90719 g).

* + - * 1. OSHA Standard 29 CFR 1926.501.
        2. OSHA Standard 29 CFR 1926.502.
        3. Canadian National Building Code 4.1.5.14
        4. Ontario Building Code Section 4.1.5.14
        5. California Building Code 1710A.3.1.
        6. California Code of Regulations Title 8 Sections 3209 and 3294.
      1. Materials:
         1. Gatorshield Tubing:

Base Metal: ASTM A500 Carbon Steel.

Zinc Spelter - ASTM B6 High Grade Special High Grade Zinc.

Chemical Composition - ASTM A500.

Material Testing -ASTM500 and ASTM E8.

Tubing Cut on Site: Apply zinc rich paint to the cut end of the tube.

* + - * 1. Cast Clamps: Threadkoat applied to tapped holes. Grub screws are carbon steel and have Keekoat protection applied to ensure minimal maintenance.
        2. Cast Clamps Used to Join the Guardrail: Galvanized malleable cast iron produced to ASTM A47.
        3. Base Plate Metal Roofs: Galvanized steel to ASTM A53 and ASTM A123.
        4. Metal Roof Panels: Minimum steel thickness 0.0275 inches (0.698 mm) require 2 rivets per corner.

Butyl Sealing Strips: Maintain the roof's integrity (TA-SEAL 49 ft roll)

Fixing Centers: 16, 18, 20.86, and 24 inches (406, 457, 530, and 610 mm). Composite roof panels with minimum steel thickness 0.0197 inches (0.500 mm) thick require 4 rivets per corner. Includes butyl sealing strip to maintain roof's integrity (TA-SEAL 49 ft (15 m) roll) Fixing centers: 12 or 14.56 inches (305 or 370 mm).

\*\* NOTE TO SPECIFIER \*\* Delete system design not required.

* + - 1. System Design: Designed for applications with flat or slope roof up to 45 degrees.
         1. Maximum Bay Centers for slopes up to 10 degrees:

First or End Bay Length: 8 inches (203 mm).

Subsequent Bay Lengths: 8 feet (2438 mm).

* + - * 1. Maximum Bay Centers for slopes up to 5 degrees:

First or End Bay Length: 3 feet 3 inches (991 mm).

Subsequent Bay Lengths: 6 feet 6 inches (1981 mm).

* + - * 1. Guardrail Height: 42 inches (1067 mm).
      1. Top and Intermediate Rails and Vertical Support Rails: 1.9 inch (48.3 mm) external diameter.
         1. Wall Thickness: 0.109 inches (2.77 mm).
      2. Cantilever Tubes: 1.66 inches (42 mm) outside diameter.
         1. Wall thickness: 0.109 inches (2.77 mm).
      3. Attachment:

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

* + - * 1. Base Plate: Riveted to roof.
        2. Non-penetrating WFP6 galvanized steel clamps to clamp on to standing seam.
      1. Fittings: Galvanized malleable cast iron, ASTM A47 with ASTM A123 galvanizing.
      2. Fasteners: Type 304 or 305 stainless steel.
      3. Components: As scheduled and indicated on Drawings, as required to match design indicated on Drawings and as required to provide complete installation.

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

* 1. ROOFTOP HATCH SAFETY RAILING SYSTEMS (KEE HATCH)
     1. Basis of Design: KEEHATCH as manufactured by Kee Safety Inc.
        1. Description: Safety railing system designed for safe egress/ingress through roof access hatches and protection while hatch open; integrates with existing openings and ladderways.
        2. Components include but are not limited to gate subassemblies, tubing, fittings, and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
        3. Compliance:
           1. ANSI A21.1 - Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
           2. ANSI A14.3 - 2008 Ladders-fixed-safety requirement.
           3. ANSI A1264.1-2007 Safety requirement for workplace walking / working surfaces and their access.
           4. ANSI A58.1 - Minimum Design Loads in Buildings and Other Structures.
           5. OSHA Standard 29 CFR 1910.29.
           6. OSHA Standard 29 CFR 1910.28.
           7. OSHA Standard 29 CFR 1926.501.
           8. OSHA Standard 29 CFR 1926.502.
           9. Canadian National Building Code 4.1.5.14
           10. HSG-33 Health and Safety in Roof Work.
           11. HSE Specialist Report No 15.
           12. HSE Sheet 21 "Working on Flat Roofs Protection Against Falls."
           13. EU Directives and CDM Regulations.
           14. International building code 2018.
           15. BGV A1: 2000, BGG 928 and BGR 184.
           16. Health, Safety and Welfare Regulation 13 "Falls or Falling Objects."
           17. EN 13374 Class A.
           18. TUV Tested.
           19. Lifecycle testing - BC 6375-2:2009 Clause 6.5 - Opening and closing of Gate through 90 degrees.
           20. Salt Spray Testing - ASTM B117-11-55 over 200 hours to assess performance of coating to resist corrosion.

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

* + - 1. Modular and adjustable on System Configuration: Type RHSR-SS-3630 - Standard System; for roof hatches 30 inches (762 mm) by 36 inches (914 mm) with hatchway ladder mounted on 30-inch (762 mm) side of hatch opposite of hatch lid hinge.
      2. System Configuration: Type RHSR-O-3636 - Offset Hatch; for roof hatches with hatchway ladder or stairway mounted opposite of hatch lid hinge and hatch dimension on mounting side exceeds 30 inches (762 mm). Grab handles not to exceed 36 inches (914 mm) spread.
      3. System Configuration: Type RHSR-O-4848 - Offset Hatch; for roof hatches with hatchway ladder or stairway mounted opposite of hatch lid hinge and hatch dimension on mounting side exceeds 30 inches (762 mm). Grab handles not to exceed 36 inches (914 mm) spread.
      4. System Configuration: Type RHSR-FB-3054 - Forward Barrier Hatch; for roof hatches with hatchway ladder or stairway mounted to exit on side of hatch.
      5. System Configuration: Type RHSR-FB-48144 - Forward Barrier Hatch; for roof hatches with hatchway ladder or stairway mounted to exit on side of hatch.
      6. System Configuration: Type RHSR-FB-4854 - Forward Barrier Hatch; for roof hatches with hatchway ladder or stairway mounted to exit on side of hatch.
      7. System Configuration: Type RHSR-FB-4896 - Forward Barrier Hatch; for roof hatches with hatchway ladder or stairway mounted to exit on side of hatch.
      8. System Configuration: Type RHSR-DL-4860 - Double Leaf Hatch.
      9. System Configuration: Type RHSR-DL-6060 - Double Leaf Hatch.
      10. System Configuration: Type FH-KK62-36X36 - Floor Hatch; for safe egress and ingress through access hatches and protection of opening.
          1. Provide lag bolts and lag shields to fix railing bases (Type 62) in place.
      11. System Configuration: Type FH-KK62-48X48 - Floor Hatch; for safe egress and ingress through access hatches and protection of opening.
          1. Provide lag bolts and lag shields to fix railing bases (Type 62) in place.
      12. System Configuration: Type FH-KK62-60X60 - Floor Hatch; for safe egress and ingress through access hatches and protection of opening.
          1. Provide lag bolts and lag shields to fix railing bases (Type 62) in place.
      13. System Configuration: Type FH-KK66-36X36 - Floor Hatch; use ground socket fittings (Type 66) that are installed flush with concrete for removable system.
      14. System Configuration: Type FH-KK66-40X40 - Floor Hatch; use ground socket fittings (Type 66) that are installed flush with concrete for removable system.
      15. System Configuration: Type FH-KK66-60X60 - Floor Hatch; use ground socket fittings (Type 66) that are installed flush with concrete for removable system.

\*\* NOTE TO SPECIFIER \*\* Delete option for toe boards if not required.

* + - 1. Toe boards: No drilling required; upright hardware and splice kits for corners and straight sections as required for complete installation.
      2. Safety Gates: Included.
      3. Nominal Pipe Size: 1-1/4 inch (32 mm).
      4. Steel Pipe: ASTM A53.
      5. Fittings: Galvanized cast iron, ASTM A47 with ASTM A123 galvanizing.
      6. Powder coating - from a wide range of RAL colors as specified by Architect
      7. Components: As scheduled and indicated on Drawings, as required to match design indicated on Drawings and as required to provide complete installation.

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

* 1. COLLECTIVE FREE-STANDING SKYLIGHT GUARDRAIL SYSTEMS (KEE DOME)
     1. Basis of Design: KEE DOME as manufactured by Kee Safety Inc.
        1. Description: Collective, free-standing, non-penetrating, modular fall-protection solution for use around skylights, roof lights and dome lights up to 78-3/4 x 78-3/4 inches (2 x 2 m) in size and on roofs with a maximum pitch of 5 degrees.
        2. Components conforming to EN 13374 and EN 14122-3: Including but not limited to vertical posts, hand, and knee rail tubing, 90 degree corner fittings, and recycled PVC feet with clamping rings as indicated or required to match design indicated on Drawings and to provide complete installation.
        3. Dome Tubing Components - North America:
           1. Tubing Lengths for Horizontal Railings: 4 ft (1219 mm), 5 ft (1524 mm), 6 ft (1829 mm), 6 ft 6 inches (1981 mm), and 10 ft 6 inches (3200 mm).
           2. Tubing Length for Vertical Posts: 2 ft (610 mm), 3 ft 7 inches (1092 mm).
           3. Tubing: 1.9 inch (48.3 mm) external diameter.

Wall thickness: 0.126 inches (3.20 mm).

* + - * 1. Tubing Material: Galvanized steel per ASTM A53.
      1. Dome Mini Tubing Components:
         1. Primary Tubing: 4 ft (1219 mm), 6 ft (1829 mm).
         2. Secondary Tubing: 4 ft 1 inch (1245 mm), 6 ft 1 inch (1854 mm),
         3. Vertical Standing Tubing: 2 ft (610 mm).
         4. Tubing Outside Diameter: 1.32 inches (33.5 mm).

Wall Thickness: 0.169 inches (4.29 mm).

* + - * 1. Material: Galvanized steel per ASTM A53.
      1. Mesh Panel for Mini Dome: 2 x 2 x 0.13 inches (51 x 51 x 3.3 mm) galvanized steel per ASTM A52.
         1. Lays on top of secondary tubing and attaches on two sides to primary tubing via Single Sided Clips.
      2. Modularity: Can be taken down, moved and re-erected.
      3. Fittings: Kee Klamp fittings galvanized to ASTM A123.
      4. Compliance:
         1. EN 14122.
         2. OSHA Standard 29 CFR 1910.23.
         3. Maximum Permissible Horizontal Load: 225 lbs (102 kg).
      5. Finish: Galvanized to BS EN ISO 1461. Hot Dip Galvanized Coatings. Specification and Testing Methods, giving an average coating of 40 microns.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required or delete basis of design options not required.

* 1. SKYLIGHT PROTECTION SCREENS (KEE COVER)
     1. Basis of Design: Model SCS - Corrugated Metal Roof Skylight Screen as manufactured by Kee Safety Inc.
        1. A metal screen system that is attached to the metal rib/corrugated building structure over a skylight panel to protect against injuries or death from accidental falls through the lens of the skylight. Attached to the building structural member using two support channels centered on the skylight.
        2. Performance: Comply with OSHA General Industry Standard 1910.28(b)(3)(i).
        3. Screen Material: 0.187 inch ( mm) galvanized carbon steel wire in a welded 4 x 4 inch (102 x 102 mm) grid, flat with an overall size of 40 x 128 inches (1016 x 3251 mm).
        4. Support Channels: 128 inch ( 3251 mm) in length are formed to fit over standard ribbed or corrugated profiles; for 10 ft (3048 mm) skylights. Channels rest on two of the skylight panel major ribs and are positioned lengthwise beyond the ends of the installed skylight and are attached through the roof to the steel or wood building purlins with supplied fasteners. The screen is attached at the same time using metal clips included in the kit.
     2. Basis of Design: Model SRS - Saf-T-Screen Fall Protection for Domed Skylights as manufactured by Kee Safety Inc.
        1. A metal screen system for commercial skylights to protect against injuries or death from accidental falls through the lens of the skylight. The screen rests on the roof surface and is engineered to transfer an impact load directly to the roof and not to the skylight curb. The screen is attached to the skylight frame with vinyl coated stainless steel straps wrapped around the vertical wire grid. Self-tapping screws fasten the screen to the skylight frame.
        2. Performance: The SRS skylight screen is designed to withstand a 400 lbs (181.4 kg) load and comply with Cal-OSHA General Industry Standard 1910.28 (b)(3)(i)
        3. Screen Material: 0.312-inch (7.92 mm) diameter 304 stainless steel or galvanized carbon steel wire in a 4 x 4-inch (102 x 102 mm) grid. The screen rests on the roof surface and is attached to the skylight frame with vinyl coated stainless steel straps mounted on the vertical wire grid.
     3. Basis of Design: Model SSS - Saf-T-Screen Fall Protection for Standing Seam Skylights as manufactured by Kee Safety Inc.
        1. A metal screen system that is attached to the standing seam roof over a skylight panel to protect against injuries or death from accidental falls through the lens of the skylight. The installation uses clamps that attach to the standing seam instead of using penetrating fasteners.
        2. Performance: Saf-T-Screen is designed and tested to comply with OSHA General Industry Standard 1910.28(b)(3)(i).
        3. Screen Material: 0.187 and/or 0.250 inch (4.75 and/or 6.35 mm) diameter 304 stainless steel wire in a 4 x 4 inch (102 x 102 mm) grid. The larger wire diameter may be used in screens designed to fit skylights of more than 25 inch (635 mm) width.
        4. Standing Seam Clamp: The unique S-5 Utility Clamp and stainless steel straps. All materials are stainless steel or aluminum.
     4. Basis of Design: Model STS - Skylight Fall Protection Screens for Domed Skylights as manufactured by Kee Safety Inc.
        1. A metal screen system that is attached to the outer frame of curb-mounted commercial skylights to protect against injuries or death from accidental falls through the lens of the skylight. A patented, non-penetrating compression installation that eliminates the use of fasteners and tapes to hold it in place on most installations. This also precludes the possibility of leaks that could be caused by fastening the screen to the skylight frame.
        2. Performance: Designed and tested to comply with OSHA General Industry Standard 1910.28(b)(3)(i).
        3. Mounting Frame: Two extruded 6005-T6 aluminum rails that rest on the outside frame of the skylight on its long sides.
        4. Frame Installation: Aluminum frame is connected with two 5/16 inch ( mm) cold rolled, zinc plated threaded rods installed on the short sides of the skylight with nylon insert lock nuts and zinc-plated washers.
        5. Screen Material: 0.187 and 0.250 inch (4.75 and 6.35 mm) diameter 304 stainless steel or galvanized carbon steel wire in a 4 x 4 inch (102 x 102 mm) grid.
        6. Screen Installation: Screens are positioned in the channel of the aluminum frame and then locked into place with 1 inch (25 mm) aluminum clips attached to the frame using 1/2 inch stainless steel hex head screws.

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

* 1. SAFETY GATES (KEE SAFETY GATES)
     1. Basis of Design: KEE SAFETY GATES, Single, Full Height, and Double as manufactured by Kee Safety Inc.
        1. A complete range of safety gates providing permanent hazard protection for internal or external applications. For any openings, ladder/stair access points, roof hatches and restricted areas. May be retrofit to existing fixed structures. The U-bolt connection allows each gate to be connected to posts from 1 to 1.5 inch (24 to 38 mm).
        2. Fully Adjustable: Single Gate: Openings 18 to 48 inches (457 to 1219 mm).
           1. Fully Adjustable: Double Gate: Openings to 81 inches (2057 mm).
        3. Gate Mounting: To the supporting structure, post, stringer with U-bolt. Can provide connection around any flat, square, or tubular stringer from 1 to 1.5 inch (24 to 38 mm).
     2. Standards Compliance:
        1. EN 13374 Class A.
        2. EN ISO 14122 Part 3 and Part 4.
        3. OSHA:
           1. Load Applied to Top Rail of Gate: 200 lbs (889.6 N).
           2. Load Applies on the Mid-Rail of the Gate: 150 lbs (667 N).
        4. ANSI: Gate must comply with the same loading requirements as the structure to which it is attached.
        5. IBC: Designed to resist linear load of 50 lbs per ft (0.73 kN per m).
        6. Ontario Building Code, NBC, and British Columbia Building Code: Handrails and any building element that could be used as handrail shall be designed and attached in such a manner to resist:
           1. Concentrated loads at any point of not less than 202 lbs (0.9 kN)
           2. Uniformly distributed load of 48 lbs per ft (0.7 kN/m).
        7. OBC and NBC: State all other guards Support:
           1. Distributed Load: 52 lbs per ft (0.75 kN per m) applied at any point on top of the guard.
           2. Concentrated Load: 225 lbs (1.0 kN) applied at any point on top of the guard.
           3. Evenly distributed vertical load on top of the guard: 103 lbs per ft (1.5 kN/m).
        8. Ontario Building Code, NBC, and British Columbia Building Code.
        9. Canadian Standards Association: 202 lbs (0.9 kN), 48 lbs per ft (0.7 kN per m). Guard: A protective barrier around an opening in a floor or at the open side of stairs, a landing, balcony, mezzanine, gallery, raised walkway or other location; used to prevent accidental falls from one level to another; such a barrier may or may not have openings through it.
        10. Canada Occupational Health and Safety:
            1. Applied Load Along Top Rail: 200 lbs (890 N).
        11. Life Cycle Testing: BS 6375-2:2009 Clause 6.5 - Opening and closing of Gate through 90 degrees.
        12. Salt Spray Testing: ASTM B117 - 11 - 55 over 200 hours to assess performance of coating to resist corrosion.
     3. Single Gate:
        1. Recommended Installed Height: 42 inches (1067 mm) but dependent on the structure it is fixed to and National Regulations. Gates can be adjusted on site.
        2. Internal Gap; Between Top and Bottom Guardrail: 18.35 inches (466 mm).
        3. Guardrail Center to Center: 19.69 inches (500 mm).
        4. Gate Widths: 18 inches (457 mm).
        5. Gate Widths: 21 inches (533 mm).
        6. Gate Widths: 24 inches (610 mm).
        7. Gate Widths: 27 inches (686 mm).
        8. Gate Widths: 30 inches (762 mm).
        9. Gate Widths: 33 inches (838 mm).
        10. Gate Widths: 36 inches (914 mm).
        11. Gate Widths: 40 inches (1016 mm).
        12. Gate Widths: 48 inches (1219 mm).
     4. Double Gate:
        1. Recommended Installed Height: 42 inches (1067 mm) but dependent on the structure it is fixed to and National Regulations. Gates can be adjusted on site.
        2. Internal Gap; Between Top and Bottom Guardrail: 18.35 inches (466 mm).
     5. Full Height Gate:
        1. Recommended Installed Height: 42 inches (1067 mm) but dependent on the structure it is fixed to.
        2. Standard Gate Width: 39.75 inches (1010 mm).
        3. Top and Bottom Guardrail Center to Center: 40.55 inches (1030 mm).
     6. Materials:
        1. Steel Tubing: EN 10255. Diameter: 1.33 inches (33.7 mm). Wall Thickness: 0.125 inches (3.2 mm).
        2. Cast Clamps: Threadkoat applied to all tapped holes. All grub screws are carbon steel and have Keekoat protection applied to ensure minimal maintenance.
        3. Where tubing is cut on site zinc rich paint is applied to the cut end of the tube.
        4. Powder Coating to EN 13438.
     7. Finishes:
        1. Hot Dipped Galvanized Steel: Components are supplied with a galvanized finish to BS EN ISO 1461 and ASTM A53. An average coating of between 55-100 microns.
        2. Aluminum: Components are supplied to Grade 6082 T6, and T4, Anodized,
        3. Stainless Steel: Components are supplied to Grade 316.
        4. Powder coating - from a wide range of RAL colors as specified by Architect.

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

* 1. PALLET GATES (KEE PIVOT)
     1. Basis of Design: KEE PIVOT. A range of pallet/mezzanine gates designed specifically to provide permanent hazard protection when moving goods between different working levels. Provide permanent protection for any openings where material/pallet access is required. The gates have been specifically designed to provide a "retrofit" solution to existing guardrails where opening protection is required.
     2. Models:
        1. Type A: Standard Gate is balanced for a positive open and close action.
           1. Pallet Size: Up to 4 ft 6 inches x 5 ft (1372 x 1524 mm).
           2. Height Capacity: 5 ft 3 inches (1600 mm).
           3. Toe-Board: Mounted on mezzanine edge side to protect workers below.
           4. Material: Gatorshied ASTM A500 steel tube and T6061-T6 Aluminum pipe.

Tube Diameter: 1.90 inches (48 mm).

Tube Wall Thickness: 0.109 inch (2.77 mm).

Tube Outside Diameter: 1.32 inch (33.5 mm).

Tube Wall Thickness: 0.125 inch (3.17 mm).

* + - * 1. Net Weight: 201 lbs (91 kg).
      1. Type B: Narrow Frame Gate is balanced for a positive open and close action.
         1. Pallet Size: Up to 4 ft 6 inches x 7 ft (1372 x 2134 mm).
         2. Height Capacity: 5 ft 3 inches (1600 mm).
         3. Toe-board: Mounted on mezzanine edge side to protect workers below.
         4. Material: Gatorshied ASTM A500 steel tube and T6061-T6 Aluminum pipe.

Tube Diameter: 1.90 inches (48 mm).

Tube Wall Thickness: 0.109 inch (2.77 mm).

Tube Outside Diameter: 1.32 inch (33.5 mm).

Tube Wall Thickness: 0.125 inch (3.17 mm).

* + - * 1. Net Weight: 188 lbs (85 kg).
      1. Type C: Tall Pallet Gate is balanced for a positive open and close action.
         1. Pallet Size: Up to 4 ft 6 inches x 8 ft (1372 x 2438 mm).
         2. Height Capacity: 7 ft 6 inches (2286 mm).
         3. Toe-board: Mounted on mezzanine edge side to protect workers below.
         4. Material: Gatorshied ASTM A500 steel tube and T6061-T6 Aluminum pipe.

Tube Diameter: 1.90 inches (48 mm).

Tube Wall Thickness: 0.109 inch (2.77 mm).

Tube Outside Diameter: 1.32 inch (33.5 mm).

Tube Wall Thickness: 0.125 inch (3.17 mm).

* + - * 1. Net Weight: 275 lbs (125 kg).
      1. Type D: Premium Wide Pallet Gate is balanced for a positive open and close action.
         1. Pallet Size: Up to 7 x 7 ft (2134 x 2134 mm).
         2. Height Capacity: 6 ft 6 inches (1981 mm).
         3. Toe-board: Mounted on mezzanine edge side to protect workers below.
         4. Material: Gatorshield ASTM A-500 steel tube and T6061-T6 Aluminum pipe.

Outside Tube Diameter: 1.90 inches (48 mm).

Tube Wall Thickness: 0.109 inch (2.77 mm).

* + - * 1. Net Weight: 170 lbs (77 kg).
    1. Testing and Certification: Tested in accordance with the following.
       1. EN ISO 14122 Part 3 and Part 4.
       2. OSHA: 200 lbs (890 N) applied to the top rail of the gate and 150 lbs (667 N) on the mid-rail of the gate.
       3. ANSI: The gate must comply with the same loading requirements as the structure to which it is attached.
       4. Canada Occupational Health and Safety: 200 lbf (890 N) applied along top rail.
       5. Life Cycle: BS 6375-2:2009 Clause 6.5: Opening and closing of the hinge mechanism.
       6. Salt Spray: ASTM B117 - 11 - 55 over 200 hours to assess performance of coating to resist corrosion.
       7. Layout:
          1. Recommended installed height of KEE PALLET GATE is 42" in the USA depending on the structure it is fixed to and National Regulations.
          2. Standard Type A, B and C gate width is 63 inches (1.6 m), Type D gate features 71 inches (1.8 m) opening. The internal gap between top and bottom guardrails is 18.35 inches (466 mm).
       8. Material:
          1. All steel components galvanized steel to ASTM A53.
          2. All fixings are hot dipped galvanized to ASTM A53.
          3. Powder coating - from a wide range of RAL colors as specified by Architect
          4. All Aluminum pipe conforming to ASTM B221.

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

* 1. ROOFTOP WALKWAY SYSTEMS (KEE WALK)
     1. Basis of Design: KEE WALK as manufactured by Kee Safety Inc.
        1. Description: Modular walkway system to provide anti-slip, level surface for demarcated route on roof, uniformly distributes pedestrian load; designed for roof types including metal profile standing seam, and membrane. KeeWalk can accommodate flat, barrel, and pitched roofs and is also field-adjustable for sloping roofs up to 35 degrees.
        2. Provide components including but not limited to clips, brackets, walkway modules and accessories with appropriate fasteners as indicated or required to match design indicated on Drawings and to provide complete installation.
        3. Compliance:
           1. Fire rated to class HB of UL 94 (harmonized with ISO 9772).
           2. Slip Resistance:

OSHA Standard 29 CFR 1910.22.

British Standard BS 4592.

* + - 1. Bearer Bars: Aluminum.
      2. Treads: Fiberglass reinforced nylon; open tread design to allow water drainage.
         1. UV Resistant and fire rates to Class HB of UL94.
         2. Sections: 59 or 118 inches (1.5 or 3 m).

\*\* NOTE TO SPECIFIER \*\* Delete system configuration options not required, then delete modules options not required.

* + - 1. System Configuration: As indicated on Drawings.
      2. System Configuration: Traverse; level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.

\*\* NOTE TO SPECIFIER \*\* Delete option for modules not required.

* + - * 1. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
        2. Modules: WW701ASSY 10 ft (3 m)Traverse, Up to 5 Degree Slopes.
        3. Modules: WW702ASSY 5 ft (1.5 m)Traverse, Up to 5 Degree Slopes.
        4. Modules: WW703ASSY 10 ft (3 m) Traverse, 5 to 10 Degree Slopes.
        5. Modules: WW704ASSY 5 ft (1.5 m) Traverse, 5 to 10 Degree Slopes.
        6. Modules: WW705ASSY 10 ft (3 m) ,Traverse, 10 to 15 Degree Slopes.
        7. Modules: WW706ASSY 5 ft (1.5 m) Traverse, 10 to 15 Degree Slopes.
        8. Modules: WW707ASSY 10 ft (3 m) Traverse, 15 to 35 Degree Slopes.
        9. Modules: WW708ASSY 5 ft (1.5 m) Traverse, 15 to 35 Degree Slopes.
        10. Modules: WW723ASSY 10 ft (3.0) Raised Traverse, Up to 5 Degree Slopes.
        11. Modules: WW724ASSY 5 ft (1.5 m) Raised Traverse, Up to 5 Degree Slopes.
        12. Modules: WW725ASSY 5 ft (0.92 m) Traverse, Up to 5 Degree Slopes.
      1. System Configuration: Longitudinal; f level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.
         1. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
         2. Modules: WW709ASSY 10 ft (3 m) Longitudinal, Up to 5 Degree Slopes.
         3. Modules: WW710ASSY 5 ft (1.5 m) Longitudinal, Up to 5 Degree Slopes.

\*\* NOTE TO SPECIFIER \*\* The following module has nylon tread.

* + - * 1. Modules: WW909ASSY 10 ft (3 m) Longitudinal, Up to 5 Degree Slopes.
      1. System Configuration: Steps; level walking surface mounted onto sub-frame fixed to roof. Two sections joined with hinged brackets at rear of assembly, rotating arms at front to level walking surface.
         1. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
         2. Modules: WW711ASSY 10 ft (3 m) Steps, 5 to 10 Degree Slopes.
         3. Modules: WW712ASSY 5 ft (1.5 m) Steps, 5 to 10 Degree Slopes.
         4. Modules: WW713ASSY 10 ft (3 m) Steps, 10 to 15 Degree Slopes.
         5. Modules: WW714ASSY 5 ft (1.5 m) Steps, 10 to 15 Degree Slopes.
         6. Modules: WW715ASSY 10 ft (3 m) Steps, 15 to 25 Degree Slopes.
         7. Modules: WW716ASSY 5 ft (1.5 m) Steps, 15 to 25 Degree Slopes.
         8. Modules: WW717ASSY 10 ft (3 m) Steps, 25 to 35 Degree Slopes.
         9. Modules: WW718ASSY 5 ft (1.5 m) Steps, 25 to 35 Degree Slopes.
      2. System Configuration: Free standing; can only be used when angle of roof surface is less than 5 degrees; held in place with the KeeGuard 100 percent recycled PVC counterbalances, does not penetrate the roof surface.

\*\* NOTE TO SPECIFIER \*\* Delete option for modules not required.

* + - * 1. Modules: As scheduled and indicated on Drawings, as required to match design indicated on the Drawings and as required to provide complete installation.
        2. Modules: WW719ASSY 10 ft (3 m) Free Standing 0 to 5 Degree Slopes; 75 mph wind.
        3. Modules: WW720ASSY 10 ft (3 m) Free Standing 0 to 5 Degree Slopes; 95 mph wind.
        4. Modules: WW721ASSY 5 ft (1.5 m) Free Standing 0 to 5 Degree Slopes; 75 mph wind.
        5. Modules: WW722ASSY 5 ft (1.5 m) Free Standing 0 to 5 Degree Slopes; 95 mph wind.

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

* 1. ROOFTOP HATCH SAFETY RAILING SYSTEMS (KEE STEP)
     1. Basis of Design: KEE STEP as manufactured by Kee Safety Inc. A safe means of access up and over obstructions present in a designated walkway as part of a safe roof access system or as a standalone item used internally (I.e. warehousing) when access is required. Can be combined with KeeWalk, or as a standalone item when accessor or egress is required over an obstruction. Provides a demarcation route for flat roofs not accessible to the public but to which access is required for the purpose of carrying out repairs and maintenance alongside use within a warehousing or internal application where access up and over plant or equipment is required in order to provide safe passage from point to point.
        1. Performance and Design Requirements:
           1. Designed as a permanently installed system. Dismantling and reconstruction at a different location is permissible under certain circumstances.
           2. The Step Over system is only regarded as being used for its intended use if all the following conditions are met:
           3. The Step Over system is governed by various workplace Regulations and Guidelines.

HSG-33 - Health and Safety in Roof work.

HSE INDG 284 - Working on Flat Roofs.

OSHA 1910.28 - Duty to have fall protection and falling object protection.

OSHA 1910.25 - Stairways.

ASCE 7-16 - minimum design loads and associated criteria for buildings and other structures.

* + - * 1. Load-Bearing Capacity: For the roof, or area in which the system is to be installed must correspond to the total weight of the system plus potential personnel.
        2. System must be linked to the building's lightning protection system if possible, or earth bonded if used internally.
        3. External Use: Additional securing is necessary when the wind speed is 17mph or greater, and gusting at 26 mph. or greater.
        4. Use of Walkway system should cease when the average (mean) wind speed reaches 23 mph or gusting to 35 mph or over.
        5. The installed surface must be free from algae, stones, oil, grease, water accumulation and loose debris.
      1. Materials: Cast Iron, Galvanized steel, aluminum alloy, and high grade nylon, galvanized and aluminum serrated bar grating.
      2. Product: SAP-S-1-NS-8.
         1. Clearance (H): 13.5 inches (343 mm).
      3. Product: SAP-S-2-NS-8.
         1. Clearance (H): 22.25 inches (565 mm).
      4. Product: SAP-S-3-NS-8.
         1. Clearance (H): 31 inches (7897 mm).
      5. Product: SAP-S-4-NS-8.
         1. Clearance (H): 39.75 inches (1010 mm).
      6. Product: SAP-S-5-NS-8.
         1. Clearance (H): 48.5 inches (1232 mm).
      7. Product: SAP-S-6-NS-8.
         1. Clearance (H): 57.25 inches (1454 mm).
      8. Product: SAP-S-7-NS-8.
         1. Clearance (H): 66 inches (1676 mm).
      9. Product: SAP-S-8-NS-8.
         1. Clearance (H): 74.75 inches (1898 mm).
      10. Product: SAP-S-9-NS-8.
          1. Clearance (H): 83.5 inches (2121 mm).
      11. Product: SAP-S-10-NS-8.
          1. Clearance (H): 92.25 inches (2343 mm).
      12. Product: SAP-S-11-NS-8.
          1. Clearance (H): 101 inches (2565 mm).
      13. Product: SAP-S-12-NS-8.
          1. Clearance (H): 109.75 inches (2788 mm).
      14. Product: SAP-B-1-NS-8.
          1. Clearance (L): 8 inches (203 mm).
      15. Product: SAP-B-2-NS-8.
          1. Clearance (L): 17.75 inches (451 mm).
      16. Product: SAP-B-3-NS-8.
          1. Clearance (L): 27.5 inches (698 mm).
      17. 17. Product: SAP-B-4-NS-8.
          1. Clearance (L): 37.25 inches (946 mm).
      18. 18. Product: SAP-B-5-NS-8.
          1. Clearance (L): 47 inches (1194 mm).
      19. Product: SAP-B-6-NS-8.
          1. Clearance (L): 56.75 inches (1441 mm).
      20. Product: SAP-B-7-NS-8.
          1. Clearance (L): 66.5 inches (1689 mm).
    1. Step Over Kits:
       1. Designed in accordance with EN 14122-3 for assured safe operation.
       2. Clearance Heights Available: 24, 31-1/2, 39-3/8, 47-1/4, and 55-1/8 inches (600, 800, 1000, 1200, 1400 mm).
       3. Landing: 39-3/8 inches (1 m).
       4. Delivered pre-assembled.
       5. Includes double handrail.
       6. Product: STMFX43: Fixed Step Over 400.
          1. Clearance (HxL): 16.34 x 16.73 inches (415 x 425 mm).
       7. Product: STMFX44: Fixed Step Over 400.
          1. Clearance (HxL): 16.34 x 26.57 inches (415 x 675 mm).
       8. Product: STMFX45: Fixed Step Over 400.
          1. Clearance (HxL): 6.34 x 36.42 inches (415 x 925 mm).
       9. Fixed Step over 400:
          1. STMFX43: Clearance (HxL): 16.33 x 16.73 inches (415 x 425 mm).
          2. STMFX44: Clearance (HxL): 16.33 x 26.57 inches (415 x 675 mm).
          3. STMFX45: Clearance (HxL): 16.33 x 36.42 inches (415 x 925 mm).
       10. Fixed Step Over 380.
           1. STMFX4SP6: Clearance (HxL): 14.96 x 46.46 inches (380 x 1180 mm).
           2. STMFX4SP7: Clearance (HxL): 14.96 x 56.30 inches (380 x 1430 mm).
           3. STMFX4SP8: Clearance (HxL): 14.96 x 66.14 inches(380 x 1680 mm).
           4. STMFX4SP9: Clearance (HxL): 14.96 x 75.98 inches (380 x 1930 mm).
       11. Fixed Step Over 200.
           1. STMFX23: Clearance (HxL): 7.87 x 16.73 inches (200 x 425 mm).
           2. STMFX24: Clearance (HxL): 7.87 x 26.57 inches (200 x 675 mm).
           3. STMFX25: Clearance (HxL): 7.87 x 36.42 inches (200 x 925 mm).
       12. Fixed Step Over 166.
           1. STMFX2SP6: Clearance (HxL): 6.53 x 46.46 inches (166 x 1180 mm).
           2. STMFX2SP7: Clearance (HxL): 6.53 x 56.30 inches (166 x 1430 mm).
           3. STMFX2SP8: Clearance (HxL): 6.53 x 66.14 inches (166 x 1680 mm).
           4. STMFX2SP9: Clearance (HxL): 6.53 x 75.98 inches (166 x 1680 mm).
       13. Freestanding Step Over 400:
           1. STMFS43: Clearance (HxL): 16.33 x 16.73 inches (415 x 425 mm).
           2. STMFS44: Clearance (HxL): 16.33 x 26.57 inches (415 x 675 mm).
           3. STMFS45: Clearance (HxL): 16.33 x 36.42 inches (415 x 925 mm).
       14. Freestanding Step Over 380:
           1. STMFS4SP6: Clearance (HxL): 14.96 x 46.46 inches (380 x 1180 mm).
           2. STMFS4SP7: Clearance (HxL): 14.96 x 56.30 inches (380 x 1430 mm).
           3. STMFS4SP8: Clearance (HxL): 14.96 x 66.14 inches(380 x 1680 mm).
           4. STMFX4SP9: Clearance (HxL): 14.96 x 75.98 inches (380 x 1930 mm).
       15. Freestanding Step Over 200:
           1. STMFS23: Clearance (HxL): 8.62 x 11.02 inches (219 x 280 mm).
           2. STMFS24: Clearance (HxL): 8.62 x 20.87 inches (219 x 530 mm).
           3. STMFS25: Clearance (HxL): 8.62 x 30.71 inches (219 x 780 mm).

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

* 1. DEADWEIGHT ANCHOR SYSTEMS (KEE ANCHOR)
     1. Basis of Design: KEE ANCHOR as manufactured by Kee Safety Inc. A CE approved non-penetrating, mobile, modular, deadweight anchor system for use on roofs with up to a 15 degree pitch, for use with personal protection equipment.
        1. Components and accessories as indicated or required to match design indicated on Drawings and to provide complete installation.
        2. Permitted Number of Users: Fall restraint for up to 2 workers providing they cannot get to less than 20 inches (508 mm) from the edge or other opening.
        3. Field Fabrication: No on-site welding, bending, or threading required; installed with hand tools.
        4. Finish: Galvanized to BS EN ISO 1461.
        5. Rubber Weights: Molded base weights with over 100 suction cups molded into each rubber bonded weight.
        6. Central Pedestal: Raised attachment point to reduce distance of travel during fall arrest event.

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

* + - 1. System Configuration: As indicated on Drawings.
      2. System Configuration: Standard, with 4 rubber molded weights, 6 hot dip galvanized weights; overall weight of 550 lbs (250 kg).
      3. System Configuration: Designed for single ply membrane with a smooth flat surface, with 4 rubber molded weights, 8 hot dip galvanized weights; overall weight of 660 lbs (300 kg).

\*\* NOTE TO SPECIFIER \*\* Delete optional accessory below if not required.

* + - 1. Accessory: Provide optional protective cover.

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

* 1. HORIZONTAL LIFELINE SYSTEMS (KEE LINE)
     1. Basis of Design: KEE LINE as manufactured by Kee Safety Inc.
        1. Description: Horizontal safety line system providing continuous worker attachment, accommodating up to 3 users in fall restraint and 2 users fall arrest situations.
        2. Components and accessories as indicated or required to match the design indicated on Drawings and to provide complete installation.
        3. Standards Compliance:
           1. ANSI Z359all Protection Code most current edition.
           2. CSA Z259.
           3. AS/NZS 1891.2.
           4. OSHA 1926.502 Fall Prevention Systems and Criteria and Practices most current edition.
           5. OSHA 1910.140 Personal Fall Protection Systems.
           6. State Administrative Code Safety Standards for Fall Restraint and Fall Arrest.
           7. International Building Code.
           8. AWS structural specification D1.1.
           9. ASTM A 36-05a: Standard Specification for Carbon Structural Steel.
        4. Wire: 5/16 inch (8 mm), grade 316 stainless steel wire 7 x 7 structure. Breaking Resistance: Greater than 8318 lbs (37 kN). The system is pre-tensioned to 180 lbsf (800 N).
        5. Material:
           1. Primary Components Connecting to the Cable: 316 Grade Stainless Steel.
           2. Secondary Components: Steel to A283D A529 Gr.D.

Hot dipped galvanized to ASTM A53 and A123.

All fixings are A2 Grade Stainless Steel.

* + - 1. Hardware: 316 stainless steel electro-polished brackets, 316 stainless steel detachable travelers and powder coated anchors; system incorporates inline shock absorbers.

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

* + - 1. System Configuration: As indicated on Drawings.
      2. System Configuration: For use with KEE ANCHOR; non-penetrating.
      3. System Configuration: KeeLine for Structures.
         1. Provide components including but not limited to extremity brackets, absorbers, line swages, 316 stainless steel extended intermediates and standard intermediate brackets and swage assemblies.
         2. Brackets: Fix directly to steel, concrete, brick, or stonework; suitable for horizontal or side-mounted applications.
      4. System Configuration: KeeLine for Roofs; with ' see through' top mount posts.
         1. E1: Extremity Assembly (start of system): Upright post, energy absorber, tension indicator and swage assembly.
         2. E2: Extremity Assembly (end of system): Upright post, energy absorber and swage assembly.
         3. EI: Extended Intermediate Assembly: Includes upright post and 316 stainless steel intermediate bracket (adjustable up to 15 degrees either side).
         4. I: Intermediate Assembly: Includes upright post and extended 316 stainless steel intermediate bracket.
         5. C: Corner Assembly, 90 degrees: Includes upright post and 316 stainless steel corner bracket.
         6. C: Corner Assembly 135 degrees: Includes upright post and 316 stainless steel corner bracket.

\*\* NOTE TO SPECIFIER \*\* Delete options for base plates not required.

* + - * 1. Base Plates: As indicated on Drawings.
        2. Base Plates: For metal profiled roofs; attached with rivets, iso-butyl sealing strip to maintain roof integrity, pre-drilled hole centers.
        3. Base Plates: For standing seam roofs; fixed with non-penetrating S5 clamps, pre-drilled hole centers.
        4. Base Plates: For membrane roofs with metal deck; top mounted with toggle bolts and toggle guides to suit range of standard deck profiles.
        5. Base Plates: For membrane roofs with concrete deck; top mounted with resin or mechanical anchors.
      1. System Configuration: KeeLine for Roofs; with Kee Rigid Anchor posts. When the KeeLine system is required to be mounted directly to the building structure.
         1. E1 Extremity Assembly (start of system): Upright post, energy absorber, tension indicator and swage assembly.
         2. E2 Extremity Assembly (end of system): Upright post, energy absorber and swage assembly.
         3. EI Extended Intermediate Assembly: Upright post and 316 stainless steel intermediate bracket (adjustable up to 15 degrees either side).
         4. I Intermediate assembly: Upright post and extended intermediate bracket.
         5. C Corner Assembly, 90 Degrees: Upright post and 316 stainless steel corner bracket.
         6. C Corner Assembly 135 Degrees: Upright post and 316 stainless steel corner bracket.
         7. Posts: Fixed anchor points to be installed directly to the building supporting structure.
         8. Attachment: As indicated on Drawings.
         9. Post Finish: Galvanized in accordance with ASTM A123.

\*\* NOTE TO SPECIFIER \*\* Fill in blank below as applicable. Delete options for attachment not required.

* + - * 1. Height Above Beam: \_\_\_\_\_\_\_\_\_\_\_\_.
        2. Height Above Beam: As indicated on Drawings.

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

* 1. OVERHEAD TRACK FALL PROTECTION SYSTEM (KEE TRACK)
     1. Basis of Design: KEE TRACK fall protection systems as manufactured by Kee Safety Inc. A rigid rail overhead track system. Offers the safety of short fall arrest distances, with modular installation.
        1. Lightweight Trolley with Sealed Bearings: Allows complete hands-free movement throughout the system.
        2. Number of Active Users: Up to 4 subject to configuration and site conditions.
        3. Mounting: The system can be made secure to internal roof structures such as beams, trusses, and concrete.
           1. Where necessary, bespoke connectors can be supplied.
           2. Primary and secondary steelwork: Works with the columns, rafters, and bracing.
           3. Secondary steelwork: Works with the purlins.
        4. Restrictions: System is configured in straight lines.
           1. The 600 Series Trolley: Single person use only. Each user is to have their own 600 Series trolley.
           2. Operators must be connected via a lanyard or retractable lanyard.

Free Fall Limit: Less than 2 ft (610 mm).

Lanyard Angle Offset: 30 degrees or less from vertical.

Offset beyond 30 degrees may cause PPE to malfunction or cause severe pendulum resulting in injury or death.

Retractable Lanyard: Positioned at least 2 ft (610 mm) above operator's head to ensure correct fall arrest action.

* + - * 1. Not to be used for tethering or lifting machinery or equipment.
        2. Safety System: Must be recertified by a competent height safety inspector.

Non corrosive/mild environment: Every 12 months.

Corrosive/harsh environment: Every 6 months; more frequent inspection may be required.

* + - 1. Performance and Design Requirements:
         1. Maximum Impact Force: 1349 lbsf (6 kN). System is to be used with PPE that includes a means of dissipating energy that limits the
      2. Certifications Compliance: Certified to one or more of the following:
         1. EN 360 - Self retractable type fall arresters (EN 360:2016).
         2. EN 355 - Personal protective equipment against falls from a height - Energy absorbers.
         3. ANSI Z359.14-2014 - Safety Requirements for Self-Retracting Devices for Personal Fall Arrest And Rescue Systems.
         4. ANSI Z359.13-2013 - Personal Energy Absorbers and Energy Absorbing Lanyards.
         5. CSA Z259.2.2-17 - Self-Retracting Devices.
         6. CSA Z259.11-17- Personal energy absorbers and lanyards.
      3. Material: Galvanized steel.
      4. Full Body Harness: Certified by one or more of the following.
         1. Certification: EN 361.
         2. Certification: OSHA 1926.502 (d) (18).
         3. Certification: ANSI Z359.11.
         4. Certification: CSA Z259.10.
      5. Self-Retractable Fall Arresters: Certified by one or more of the following.
         1. Certification: OSHA 1926.502 (d) (12).
         2. Certification: ANSI Z359.14.
         3. Certification: ANSI Z359.2.2-17.

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

* 1. SINGLE RIGID ANCHOR FALL PROTECTION SYSTEM (KEE POST)
     1. Kee Rigid Anchor - Bolt Around. Bolts to concrete or existing beams.
        1. Beam height or Concrete Thickness: 12 inches (305 mm) maximum.
        2. Standards Compliance:
           1. ANSI/AISC 360-16 "Specification for Structural Steel Buildings."
           2. AISC Manual of Steel Construction (14th Edition).
           3. AISC Design Guide 1, 2nd Edition - Base Plate and Anchor Rod Design.
           4. ANSI Z359.6 "Design of Active Fall Protection."
           5. OSHA 1910.140 (d).
           6. IBC 2018.
           7. ASCE 7-16.
           8. IWCA I-14.1-2001 "Window Cleaning Safety."
        3. Each installation shall be approved by a qualified engineer to local standards and regulations.
        4. Horizontal Load and Reaction Any Direction: 5000 lbs (22.24 kN).
        5. Moment Reaction: 125000 in-lbs (14123 N-m).
        6. Overall Height: 25 inches (635 mm).
        7. Post Height: 20 inches (508 mm).
        8. Post Height: \_\_\_ inches (\_\_\_ mm).
        9. Materials:
           1. All fabrication shall be performed in compliance with the AWS Code by AWS Certified Welders.
           2. Steel material shall conform to the following unless noted otherwise:

Hollow Structural Sections: ASTM A500 grade C, min yield strength 46 ksi.

Plates: ASTM A572 Grade 50, min yield strength 50 ksi.

Top attachment point:

Forged D-ring: ASTM A105.

Stainless steel u-bar: ASTM A276 Type 304 Condition A Cold Finished, min yield strength 70 ksi.

Tapped hole:

Bolts: DIN EN ISO 3506-1:2009: Designation A4-70.

Nuts: DIN EN ISO 3506-2 :2009: Designation A4-70.

Washers: DIN EN ISO 3506-2 :2009: Designation A4-70.

Base connection to existing structure:

Threaded rods: ASTM A193 Grade B7.

Nuts: ASTM A194 Grade 2H.

Washers: ASTM F436.

* + - * 1. Structural Steel Connections:

All welding to conform to the revisions of the American welding society code.

AWS D1.1 electrodes must match base metals as specified in the AISC manual.

All welds shown on the drawings should be shop weld.

Welded connection shall have a minimum of 1/4 inch (6 mm) fillet weld uno.

Weld size shown on the design drawings are considered effective weld size and shall be increased in accordance with AWS as required by gaps or skews between components.

* + - * 1. Paint and Coatings: All anchor components (excluding fasteners) shall be hot dipped galvanized in accordance with ASTM A123.
    1. Kee Rigid Anchor - Weld On.
       1. Beam Width Minimum: 2-1/16 inches (52 mm).
       2. Standards Compliance:
          1. ANSI/AISC 360-16 "Specification for Structural Steel Buildings."
          2. AISC Manual of Steel Construction (14th Edition).
          3. AISC Design Guide 1, 2nd Edition - Base Plate and Anchor Rod Design.
          4. ANSI Z359.6 "Design of Active Fall Protection."
          5. OSHA 1910.140 (d).
          6. IBC 2018.
          7. ASCE 7-16.
          8. IWCA I-14.1-2001 "Window Cleaning Safety."
       3. Each installation shall be approved by a qualified engineer to local standards and regulations.
       4. Horizontal Load and Reaction Any Direction: 5000 lbs (22.24 kN).
       5. Moment Reaction: 125000 in-lbs (14123 N-m).
       6. Overall Height: 25 inches (635 mm).
       7. Post Height: 20 inches (508 mm).
       8. Post Height: \_\_\_ inches (\_\_\_ mm).
       9. Materials:
          1. All fabrication shall be performed in compliance with the AWS Code by AWS Certified Welders.
          2. Steel material shall conform to the following unless noted otherwise:

Hollow Structural Sections: ASTM A500 grade C, min yield strength 46ksi.

Plates: ASTM A572 Grade 50, min yield strength 50 ksi.

Top attachment point:

Forged D-ring: ASTM A105.

Stainless steel u-bar: ASTM A276 Type 304 Condition A Cold Finished, min yield strength 70 ksi.

Weld electrodes: (E70XX) for steel, (309 L) for stainless.

* + - * 1. Structural steel connections:

All welding shall conform to the revisions of the American welding society code.

AWS D1.1 electrodes shall match base metals as specified in AISC manual.

All welds shown on the drawings should be shop weld.

Welded connection shall have a minimum of 1/4 inch (6 mm) fillet weld.

Weld size shown on the design drawings are considered effective weld size and shall be increased in accordance with AWS as required by gaps or skews between components.

* + - * 1. Paint and Coatings: All anchor components (excluding fasteners) shall be hot dipped galvanized in accordance with ASTM A123.
    1. Kee Rigid Anchor: Cast in Place.
       1. Concrete Thickness Minimum: 7 inches (178 mm).
       2. Standards Compliance:
          1. ANSI/AISC 360-16 "Specification for Structural Steel Buildings."
          2. AISC Manual of Steel Construction (14th Edition).
          3. AISC Design Guide 1, 2nd Edition - Base Plate and Anchor Rod Design.
          4. ANSI Z359.6 "Design of Active Fall Protection."
          5. OSHA 1910.140 (d).
          6. IBC 2018.
          7. ASCE 7-16.
          8. IWCA I-14.1-2001 "Window Cleaning Safety."
       3. Each installation shall be approved by a qualified engineer to local standards and regulations.
       4. Horizontal Load and Reaction Any Direction: 5000 lbs (22.24 kN).
       5. Moment Reaction: 125000 in-lbs (14123 N-m).
       6. Overall Height: 25 inches (635 mm).
       7. Post Height: 20 inches (508 mm).
       8. Post Height: \_\_\_ inches (\_\_\_ mm).
       9. Materials:
          1. All fabrication shall be performed in compliance with the AWS Code by AWS Certified Welders.
          2. Steel material shall conform to the following unless noted otherwise:

Hollow Structural Sections: ASTM A500 grade C, min yield strength 46ksi.

Plates: ASTM A572 Grade 50, min yield strength 50 ksi.

Top Attachment Point:

Forged D-ring: ASTM A105.

Stainless steel u-bar: ASTM A276 Type 304 Condition A Cold Finished, min yield strength 70 ksi.

Tapped Hole:

Bolts: DIN EN ISO 3506-1:2009: Designation A4-70.

Nuts: DIN EN ISO 3506-2 :2009: Designation A4-70.

Washers: DIN EN ISO 3506-2 :2009: Designation A4-70.

Base Connection to Existing Structure:

Threaded Rods: ASTM A193 Grade B7.

Nuts: ASTM A194 Grade 2H.

Washers: ASTM F436.

* + - * 1. Structural Steel Connections:

Welding is to conform to the revisions of the American Welding Society Code.

AWS D1.1 electrodes shall match base metals as specified in AISC manual.

All welds shown on the drawings should be shop welds.

Welded connection is to have a minimum of 1/4 inch (6 mm) fillet weld.

Weld size shown on the design drawings are considered effective weld size and shall be increased in accordance with AWS as required by gaps or skews between components.

* + - * 1. Paint and Coatings: All anchor components (excluding fasteners) shall be hot dipped galvanized in accordance with ASTM A123.
    1. Kee Rigid Anchor - Epoxy Adhesive:
       1. Concrete Thickness Minimum: 8 inches (203 mm).
       2. Standards Compliance:
          1. ANSI/AISC 360-16 "Specification for Structural Steel Buildings."
          2. AISC Manual of Steel Construction (14th Edition).
          3. AISC Design Guide 1, 2nd Edition - Base Plate and Anchor Rod Design.
          4. ANSI Z359.6 "Design of Active Fall Protection."
          5. OSHA 1910.140 (d).
          6. IBC 2018.
          7. ASCE 7-16.
          8. IWCA I-14.1-2001 "Window Cleaning Safety."
       3. Each installation shall be approved by a qualified engineer to local standards and regulations.
       4. Horizontal Load and Reaction Any Direction: 5000 lbs (22.24 kN).
       5. Moment Reaction: 125000 in-lbs (14123 N-m).
       6. Overall Height: 25 inches (635 mm).
       7. Post Height: 20 inches (508 mm).
       8. Post Height: \_\_\_ inches (\_\_\_ mm).
       9. Materials:
          1. All fabrication shall be performed in compliance with the AWS Code by AWS Certified Welders.
          2. Steel material shall conform to the following unless noted otherwise:

Hollow Structural Sections: ASTM A500 grade C, min yield strength 46 ksi.

Plates: ASTM A572 Grade 50, min yield strength 50 ksi.

Top attachment point:

Forged D-ring: ASTM A105.

Stainless steel u-bar: ASTM A276 Type 304 Condition A Cold Finished, min yield strength 70 ksi.

Tapped hole:

Bolts: DIN EN ISO 3506-1:2009: Designation A4-70.

Nuts: DIN EN ISO 3506-2 :2009: Designation A4-70.

Washers: DIN EN ISO 3506-2 :2009: Designation A4-70.

Base connection to existing structure:

Threaded rods: ASTM A193 Grade B7.

Nuts: ASTM A194 Grade 2H.

Washers: ASTM F436.

* + - * 1. Structural steel connections:

All welding shall conform to the revisions of the American welding society code.

AWS D1.1 electrodes shall match base metals as specified in AISC manual.

All welds shown on the drawings should be shop weld.

Welded connection shall have a minimum of 1/4 inches (6 mm) fillet weld uno.

Weld size shown on the design drawings are considered effective weld size and shall be increased in accordance with AWS as required by gaps or skews between components.

* + - * 1. Paint and Coatings: All anchor components (excluding fasteners) shall be hot dipped galvanized in accordance with ASTM A123.
    1. Kee Rigid Anchor - Bolt On:
       1. Beam Width Minimum: 4-1/4 inches (108 mm).
       2. Standards Compliance:
          1. ANSI/AISC 360-16 "Specification for Structural Steel Buildings."
          2. AISC Manual of Steel Construction (14th Edition).
          3. AISC Design Guide 1, 2nd Edition - Base Plate and Anchor Rod Design.
          4. ANSI Z359.6 "Design of Active Fall Protection."
          5. OSHA 1910.140 (d).
          6. IBC 2018.
          7. ASCE 7-16.
          8. IWCA I-14.1-2001 "Window Cleaning Safety."
       3. Each installation shall be approved by a qualified engineer to local standards and regulations.
       4. Horizontal Load and Reaction Any Direction: 5000 lbs (22.24 kN).
       5. Moment Reaction: 125000 in-lbs (14123 N-m).
       6. Overall Height: 25 inches (635 mm).
       7. Post Height: 20 inches (508 mm).
       8. Post Height: \_\_\_ inches (\_\_\_ mm).
       9. Materials:
          1. All fabrication shall be performed in compliance with the AWS Code by AWS Certified Welders.
          2. Steel material shall conform to the following unless noted otherwise:

Hollow Structural Sections: ASTM A500 grade C, min yield strength 46ksi.

Plates: ASTM A572 Grade 50, min yield strength 50 ksi.

Top attachment point:

Forged D-ring: ASTM A105.

Stainless steel u-bar: ASTM A276 Type 304 Condition A Cold Finished, min yield strength 70 ksi.

Tapped hole:

Bolts: DIN EN ISO 3506-1:2009: Designation A4-70.

Nuts: DIN EN ISO 3506-2 :2009: Designation A4-70.

Washers: DIN EN ISO 3506-2 :2009: Designation A4-70.

Base connection to existing structure:

Threaded rods: ASTM A193 Grade B7.

Nuts: ASTM A194 Grade 2H.

Washers: ASTM F436.

* + - * 1. Structural steel connections:

All welding shall conform to the revisions of the American welding society code.

AWS D1.1 electrodes shall match base metals as specified in AISC manual.

All welds shown on the drawings should be shop weld.

Welded connection shall have a minimum of 1/4 inch (6 mm) fillet weld.

Weld size shown on the design drawings are considered effective weld size and shall be increased in accordance with AWS as required by gaps or skews between components.

* + - * 1. Paint and Coatings: All anchor components (excluding fasteners) shall be hot dipped galvanized in accordance with ASTM A123.

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

* 1. FREE-STANDING WARNING LINE SYSTEMS (KEE MARK)
     1. Basis of Design: KEE MARK as manufactured by Kee Safety Inc.
        1. Description: Modular, free-standing demarcation/warning line system composed of steel uprights and rubber bases. Perfect for immediate needs and quick setups.
        2. Compliance: OSHA Code 1926.502(f)(2)(iii); erected not less than 6 feet (1.8 m) from the roof edge. resists, without tipping over, a force of at least 16 lbs (71 N) applied horizontally against the stanchion.
        3. Fittings: Kee Klamp fittings galvanized to ASTM A123.
        4. Flags: Heavy-duty nylon mesh flags.

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

* + - * 1. Color: As indicated on Drawings.
        2. Color: Orange.
        3. Color: Yellow.
      1. Wire Cable: Stainless steel wire cable, connected to the uprights with stainless steel shackles.
      2. Removable Bases: Solid, heavy-duty recycled rubber.
      3. Kit Description:

\*\* NOTE TO SPECIFIER \*\* If the application requires just a 20 ft (6.1 m) run, the Kee Mark Base Kit can be used by itself. To cover bigger areas, add as many extension kits to the base kit as needed. Delete options for color not required.

* + - * 1. Kit: KMWL20 Kee Mark Warning Line Base 20 feet (6.1 m) Long Kit.
        2. Kit: KMWL20E Kee Mark Warning Lane Extension 20 feet (6.1 m) Long Kit.
  1. FABRlCATlON
     1. Comply with design and specified requirements.
     2. Fit and shop assemble components in largest practical sizes for delivery to site.
        1. Provide weep holes where water may accumulate.
        2. No welded connections.
        3. Cap exposed railing ends.
     3. Upright tops shall be plugged with weather and light resistant material.
     4. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

1. EXECUTION
   1. EXAMINATION
      1. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      2. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
      3. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as sleeves, concrete inserts, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete and masonry construction.
         1. Coordinate delivery of anchorages to project site.
         2. Coordinate that blocking is in place for all mounting fasteners.
   2. INSTALLATION
      1. Install in accordance with manufacturer's instructions including the following:
         1. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 ft-lbs (39.3 N-m) of torque.
         2. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails and accurately in location, alignment, and elevation, measured from established lines and levels.
         3. Set posts plumb within a tolerance of 1/8 inch (3 mm).
   3. PROTECTION
      1. Protect installed products until completion of project.
      2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION