

RF Screening Applications



High Performance
Composite Solutions

Fibergrate has led the way in the development, manufacture and application of fiberglass reinforced plastic (FRP) structural products. Combining strength, corrosion resistance, maintenance free long life and integral safety characteristics, these advanced composite products have proven superior to maintenance intensive metallic structures. The Fibergrate product line is further strengthened through on-going product development and is value enhanced by the company's singular commitment to exceptional customer support for more than 35 years.

Fibergrate
Composite Structures
TELECOMMUNICATIONS

***RF Transparent • BTS Support Structures
Safety & Access Equipment***

Fibergrate[®] High Performance RF Screening Solutions

- ▶ More than 30 years experience in design manufacture and fabrication of fiberglass structures
- ▶ Engineering and Estimating team dedicated to the Telecommunications Market
- ▶ Nationwide field support by technical personnel to assist on walk-throughs, material, texture and color selections
- ▶ Single source, single responsibility, design guaranteed and backed by Fibergrate Composite Structures Inc.
- ▶ Design solutions provided up-front to A&E firms for presentation to zoning/building departments
- ▶ All designs offered are sealed (stamped) by a locally registered Professional Engineer (PE)
- ▶ Standard and custom designed solutions
- ▶ 2 - 3 week delivery on all standard solutions
- ▶ Standard and custom textures; color match to any building surface
- ▶ Standard products and component shapes in stock

Fibergrate[®] Features & Benefits

- ▶ All Fiberglass Construction
 - ▣ RF Transparent

- ▶ Easy to Install
 - ▣ Average Screen - One day or 40 man-hours (Compared to 5-7 days for competitive systems)
 - ▣ Designed to be assembled on ground complete with antennas, and lifted in one pick

- ▶ Lightweight (1/3 the weight of similar steel systems)
 - ▣ Smaller or No Crane required

Understanding Your Business

The telecommunication industry is the most dynamic and rapidly expanding industry in the world. This industry consistently faces challenges associated with changes in technology, competition, installation, speed-to-market, zoning and the ever-increasing density of cell sites. These issues require unique and innovative solutions that allow service providers to bring new sites on line

quickly, economically and in an aesthetic and environmentally friendly manner. Providers, architects and engineers need a knowledgeable and experienced source to address these concerns with timely and unique solutions. Fibergrate has applied our knowledge and experience with fiberglass reinforced plastics (FRP) to the development of several standardized systems for transmission site construction. In addition we work to develop customized solutions for your specific problems. Fibergrate has resources worldwide dedicated to working directly with the customer. From specification and design to site inspections and installations, Fibergrate brings superior products and unparalleled field and technical service directly to you.

Fibergrate's products are engineered to provide long-term, aesthetically superior solutions for all areas in your facility.



Problems & Solutions



In the last 10 years the telecommunications market has progressed from basic analog technology to broadband Internet access and wireless handheld devices. This evolution in technology requires the rapid development and deployment of new equipment and new sites for providers to remain competitive.

The global demand for bandwidth requires an ever-increasing density of cellular transmission sites. Service providers are faced with the growing challenges, especially in urban area of where to locate these sites. Weight, size and appearance issues can mean the difference between securing a critical rooftop transmission site and leaving a hole in a provider coverage area.

Fibergrate's lightweight and electronically transparent platform systems are ideal for installing transmission stations in areas that were previously thought impossible due to weight or zoning.

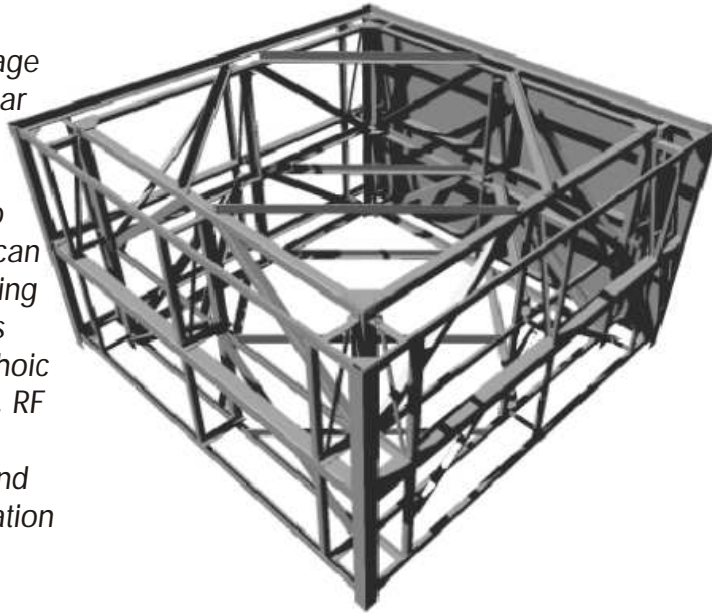
Our standardized and custom camouflage screening systems reduce visual impact of transmission antennas in urban and rural environments. These lightweight systems can be fabricated to match any building facade.

Fibergrate is committed to working closely with service providers, architects and engineers to provide the best solutions to this dynamic industry now and in the future.

RF Transparent Screening

Fibergrate has worked with the world's cellular providers to develop standardized camouflage screening systems for the cellular market.

Fibergrate's RF transparent systems are lightweight, easy to install, corrosion resistant and can be installed to match any building facade. Fibergrate RF materials have been fully tested by Anechoic Chamber 800 MHz-2200 Mhz, RF attenuation through computer modeling and extensive field and drive testing. Typical RF attenuation loss is less than 1 dB.



Equipment Access

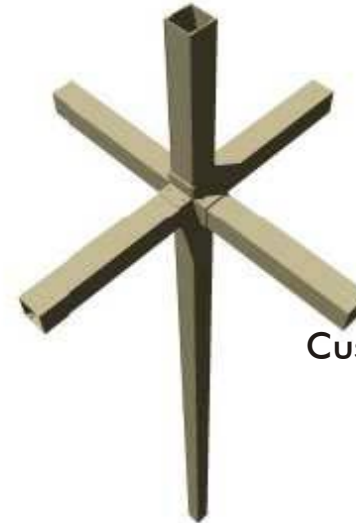
Fibergrate's handrail and safety ladder systems meet the need for long term durability, easy installation and worker safety. Our corrosion resistant, highly durable systems meet or exceed all OSHA requirements, are easily assembled on-site and are priced competitively with less durable conventional products.



BTS Support Platforms (Base Transmitter Stations)

Whether installing new 3G networks or upgrading existing networks, rooftop transmitter stations are a necessity.

Fibergrate's BTS support platforms are one-third the weight of steel and can be installed by hand, eliminating cranes, permits and restricted installation hours. A typical Fibergrate BTS can be installed in hours, instead of the days needed for a steel structure. Any modifications or on-site fabrications can be done using simple hand tools.



Custom Solutions

Whether you are looking for new, lightweight, RF transparent solutions for antenna supports or upgrading an existing cell site that is not designed for the additional loading, Fibergrate has a team of engineers dedicated to working with you to provide site-specific solutions that address your needs.

Fabrication Services



Fibergrate combines engineering skills with an unmatched knowledge of the application of composite materials. Staffed by professional engineers, experienced fabricators and project managers, Fibergrate's fabrication group is well equipped to provide turnkey solutions to a wide range of projects - from design and estimating to fabrication, final construction and installation. Fibergrate's experienced engineering group maximizes utilization of composite components while meeting OSHA, BOCA, NFPA and other applicable building codes to accommodate seismic, geographic or topographic considerations. As the leader in the use of fiberglass composites in construction, Fibergrate offers a number of related services including:

- Conceptual design
- Final engineered drawings
- Engineering specifications
- Customer design

As a measure of experience, Fibergrate has over 35 years in the engineering, design and fabrication of FRP structures and over 30,000 successful installations worldwide. Projects range from simple catwalks and stairways to engineered platforms, RF screening, antenna and equipment support structures and other ancillary elements for cellular rollouts.

Fibergrate has developed both standard and custom RF screening solutions, compliant with all building codes and certified by a Registered Professional Engineer. Fibergrate's standardized designs allow for the elimination of lengthy site design and fabrication, and give the confidence of a certified structure to ensure an on air, on time rollout in the most cost-effective manner.

Fibergrate® 17' Standard 4-Sector Screen

All Fiberglass Design RF Screen Assembly with Integral Antenna Mounting, RF Transparent, One Vendor - Eliminate Interface Conflicts!

(4' antenna separation per sector, 13° mechanical down-tilt)



Assembly time for this complete fiberglass structure with antennas and RF screening was 40 man-hours. Assembly was performed on the ground and hoisted onto the rooftop with one lift. There was no need for welding of steel structure. The installation contractor stated that this was by far, “The easiest screen to assemble and the best design he had seen.” Sound and proven structural design with stamped drawings and calculations per UBC code, typically designed for 100 mph wind @ 100' elevation.



Note flexible design and available down-tilt for antennas - azimuths can be adjusted up to 20° to either side. All mounting pipes and U-bolts for antennas are provided by Fibergrate®.

Assembly is available as a 5' tall upper cabinet with up to 10' overall height above roofline. Simply changing the leg extension kits from 5' to 10' heights (available in 1' increments) alters the standard assembly to any desired height. Easy to stock kits vary the ultimate configuration depending onsite-specific requirements.



Fibergrate® provides all downward reactions and loading for local A&E firms to design rooftop support structures. Base plate mounting hardware is provided.



All hardware behind antennas is standard 316SS or galvanized steel. Any hardware in front of antennas where RF transparency is a concern is 100% fiberglass.

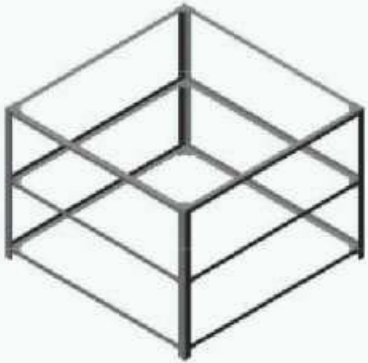
All structural calculations, RISA™ analysis and design drawings are sealed by a local state licensed PE, thus limiting the design liability for the A&E, structural engineering company and ultimately, the carrier. Fibergrate® assumes 100% of the RF screen design responsibility!

Fibergrate[®] RF Screening Design Features

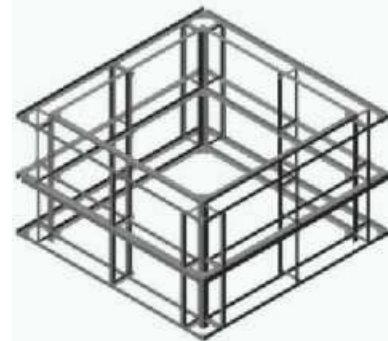
- ▶ 17' square design, 18' triangle design, 18' triangle inside of square design
- ▶ 4' separation, 13° mechanical down-tilt, 20° azimuth adjustment
- ▶ Complete design drawings and calculations provided to A&E firms for submittal to zoning and building departments - SEALED BY A LOCAL STATE REGISTERED ENGINEER
- ▶ Designed per UBC code: 100 mph @100' elevation
- ▶ 36" x 42" personnel access doors standard
- ▶ In-stock kits for all sizes and elevations
- ▶ Custom textures and colors available for more unique applications
- ▶ Custom designs also available for more unique applications
- ▶ Single material of construction - fiberglass, easy to assemble, simple hardware, field modifications with standard carpentry tools
- ▶ All parts are computer match numbered to the provided construction assembly drawing - cuts installation time to 25% of other designs
- ▶ All materials are fully tested for RF transparency, attenuation and VSWR losses
- ▶ Average ground assembly time: 40 man-hours
- ▶ Lifted onto rooftop in one-step after ground assembly
- ▶ All horizontal and vertical reactions are provided to local A&E engineering firm along with base-plate dimensions for inclusion in submittal drawings
- ▶ CUSTOM DESIGNS ARE ALSO PROVIDED - INCLUDING DETAILED DRAWINGS TO A&E FIRMS FOR INCLUSION IN ZONING SUBMITTALS!

Fibergrate® 17' Standard 4-Sector Screen

Solidworks™ 3D models illustrate the basic frame and leg extension kit, framing, cross bracing and RF fiberglass screen cladding

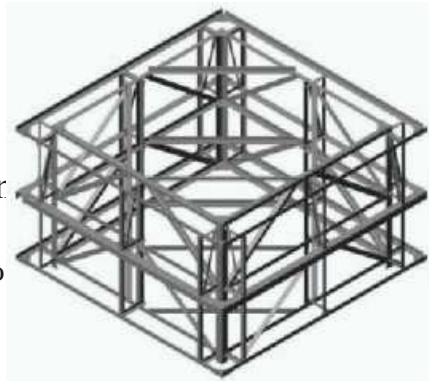


Basic Leg Frame - note (4) legs in corners. By simply changing these four elements, the basic upper 5' structure can be modified from 5' to 10' in 1' increments. Leg extension kits are available for all standard designs.

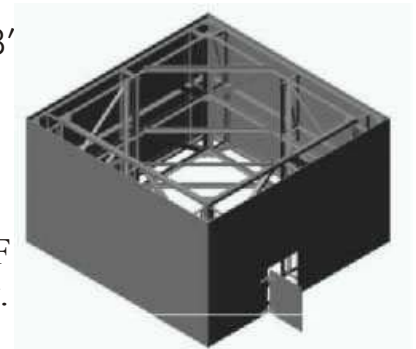


Additional Framing Support - structure showing framing for antenna mounting and RF plate supports. All structural members are fiberglass - lightweight and RF transparent.

Structural Cross-Bracing - Designed for 100-mph wind @100' elevation per UBC code requirements. Other conditions can easily be met with minor modifications. Materials are 100% fiberglass. construction.

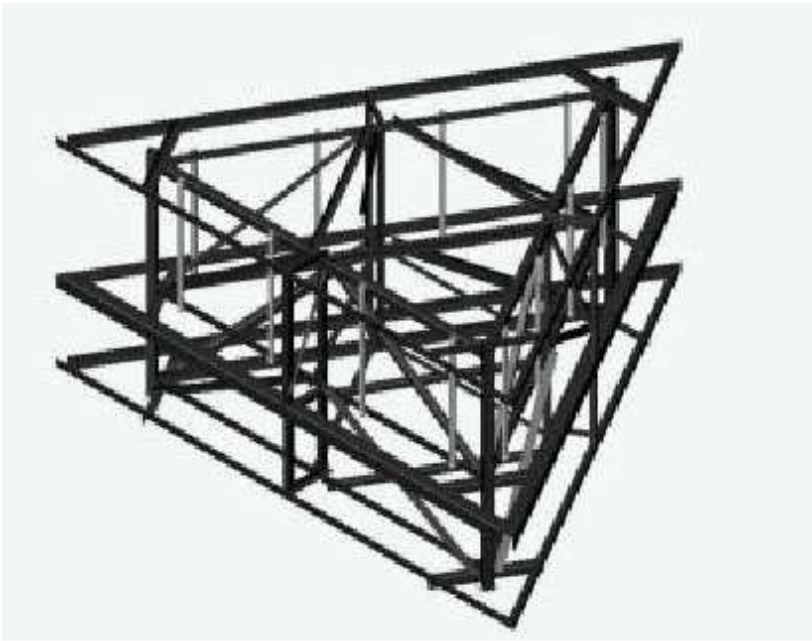


Completed Screen (Shown as 8' tall unit) - structural framing for antenna mounting and RF plate supports, cross-bracing and RF fiberglass cladding. All materials are fiberglass - lightweight and RF transparent, including access door.

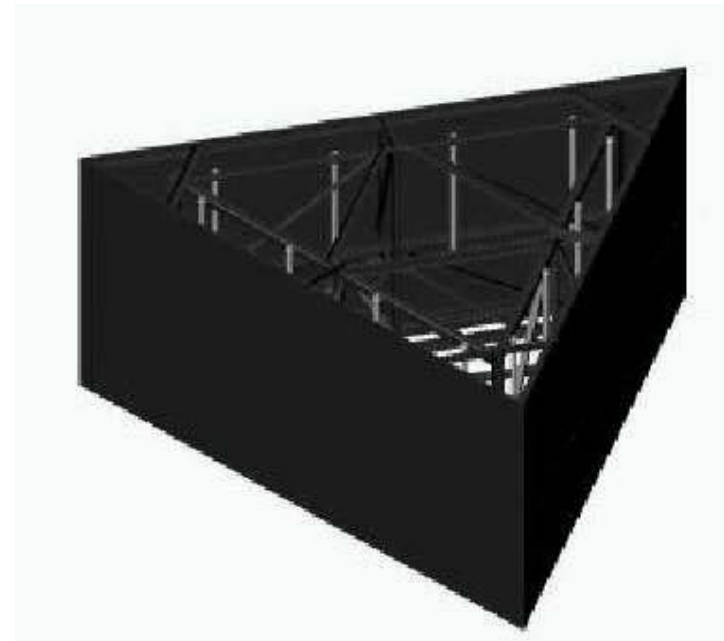


Fibergrate[®] 18' Standard Triangle 3-Sector Screen

Solidworks[™] 3D models illustrate the basic frame and leg extension kit, framing, cross bracing and complete RF fiberglass screen cladding.



Triangle Structure (including additional framing and cross-bracing) - note (3) legs in corners. By simply changing these three elements, the basic upper 5' structure can be modified from 5' to 10' in 1' increments. Leg extension kits are available for all standard designs. Note antenna mounting hardware pipes (2.5" galvanized steel) are included.



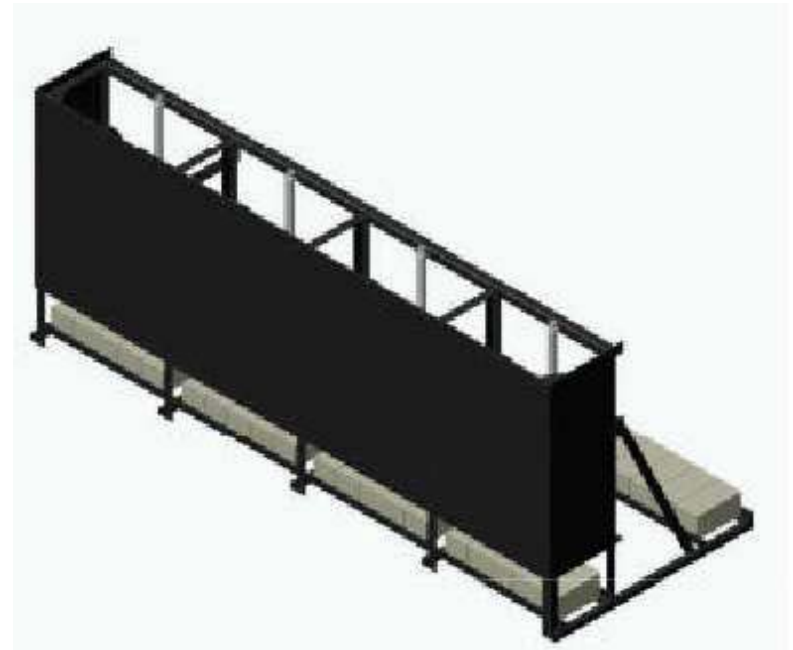
Completed Triangle RF Screen - structural framing for antenna mounting and RF plate supports, cross-bracing and RF fiberglass cladding. All materials are fiberglass - lightweight and RF transparent.

Fibergrate[®] Standard Single-Sector Screen - Various Dimensions

These Solidworks[™] 3D models are graphical representations of basic frame and leg extension kit, framing, cross bracing and RF fiberglass screen cladding



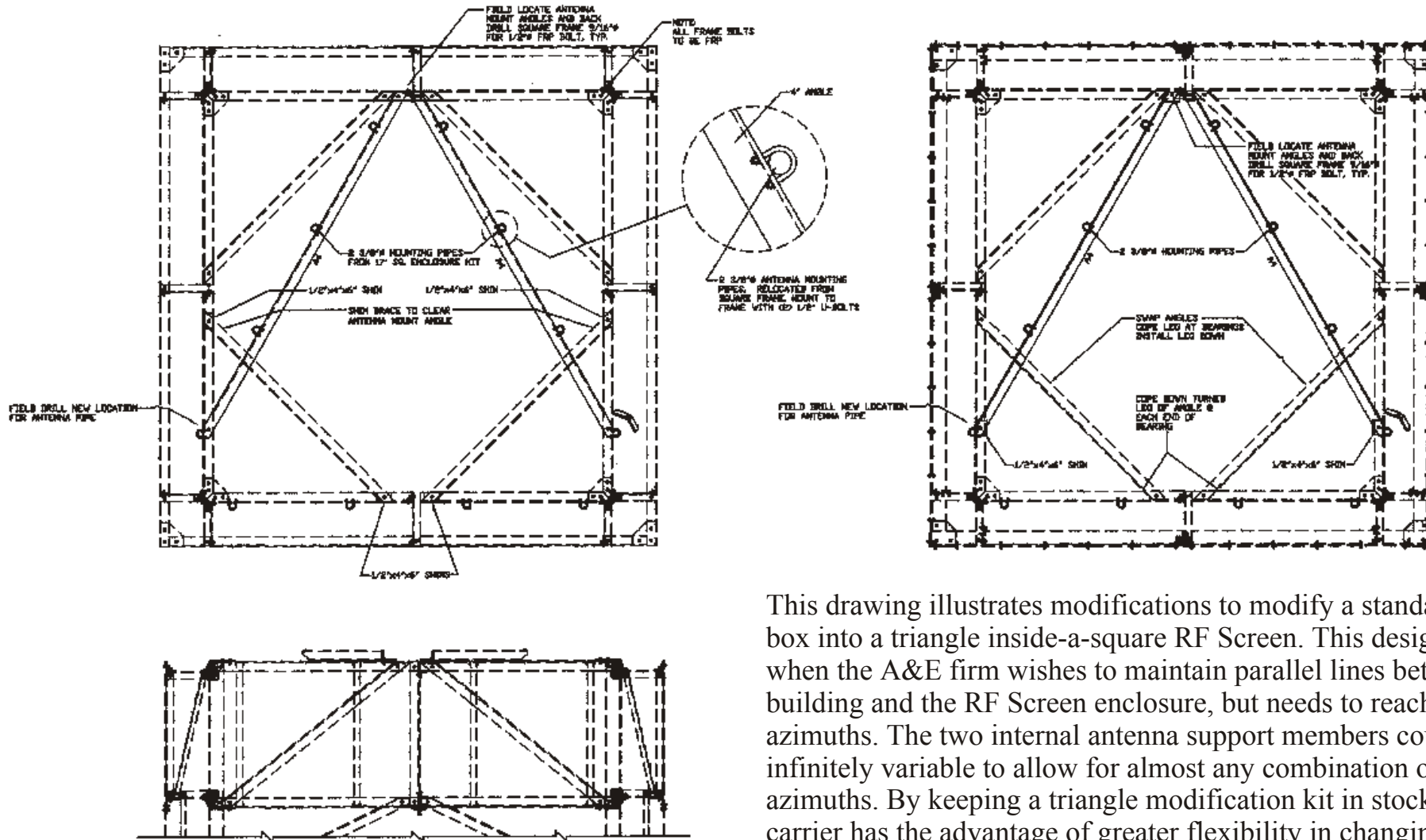
Single Sector (ballasted design) - Antenna mounting pipes are included (ballast weight is provided by others). Various dimensions are possible depending on number of antennas, separation required, etc.



Completed Single-Sector Screen - structural framing for antenna mounting and RF plate supports, cross-bracing and RF fiberglass cladding. All materials are fiberglass - lightweight and RF transparent.

Fibergrate® Standard Triangle Inside Square Design

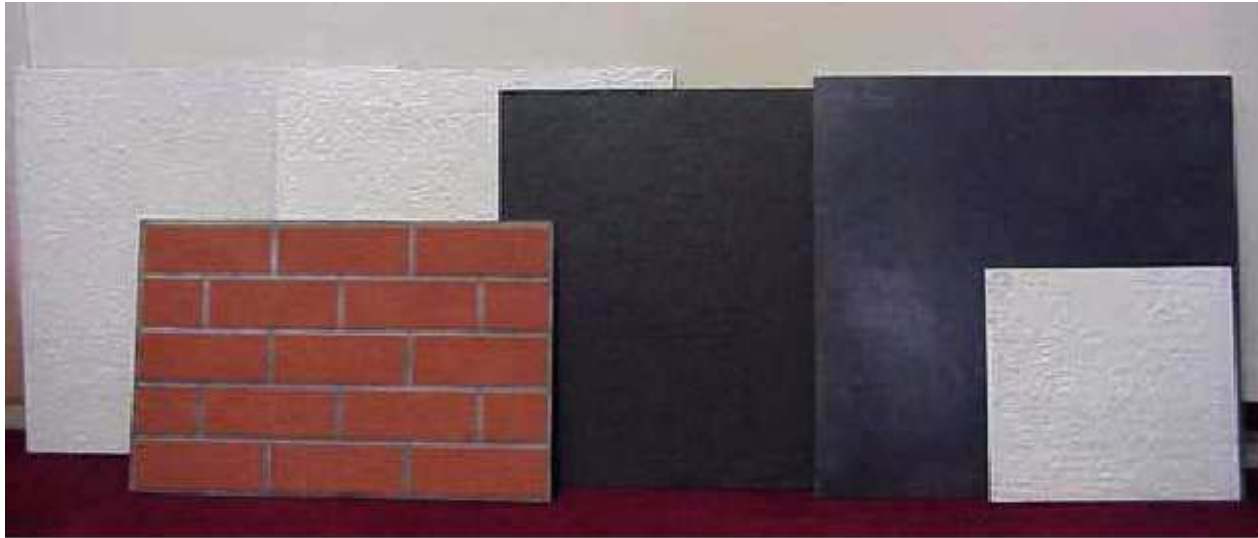
For Alternate Azimuth Requirements



This drawing illustrates modifications to modify a standard square box into a triangle inside-a-square RF Screen. This design is used when the A&E firm wishes to maintain parallel lines between the building and the RF Screen enclosure, but needs to reach difficult azimuths. The two internal antenna support members could be infinitely variable to allow for almost any combination of azimuths. By keeping a triangle modification kit in stock, the carrier has the advantage of greater flexibility in changing a standard square into a more useful and fitting design at a reasonable cost and with a very simple modification.

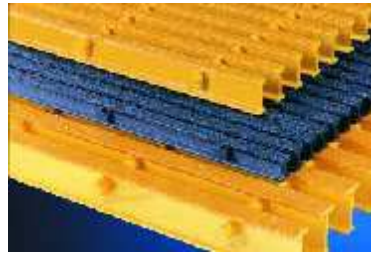
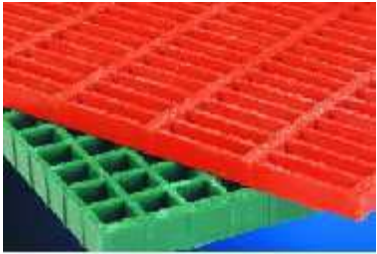
Fibergrate[®] Custom Texture and Color Matching Technology

Fibergrate[®] offers many standard textures available to match existing brick, stucco, CMU, or other common building materials. Custom textures are also available upon request. Fibergrate uses the highest quality polyurethane coatings to color match the outer textures to existing building surfaces. All that is required is a color number from standard coating chip sets or a sample of the building wall facade required to be matched.



Comprehensive sample kits are available upon request for use in the field by Site Acquisition zoning or architectural personnel.

Request Yours Today!



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