



SECTION 08880 (08 88 53)

SECURITY GLAZING

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**** NOTE TO SPECIFIER **** Riot Glass; security glazing, polycarbonate sheet.

This section is based on the products of Riot Glass, which is located at:

17941 Brookshire Lane
Huntington Beach, CA 92647
Toll Free: 800-580-2303
Email: info@riotglass.com
Web: www.riotglass.com

[Click Here](#) for additional information.

Riot Glass® is a reliable, cost-effective product line specifically designed to secure vulnerable entry points like glass doors and windows without sacrificing visual appeal.

Riot Glass® is a leading manufacturer of American-made security glass and door systems which can be utilized to protect stores, schools, commercial and government facilities, and homes from forced entry and ballistic threats.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Security glazing and framing for forced entry and ballistic protection.
- B. Compression window systems.
- C. Storefront security systems.

1.2 RELATED SECTIONS

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

- A. Section 08415 - Aluminum Entrances and Storefronts.
- B. Section 08500 - Metal Windows.
- C. Section 08800 - Glazing.

1.3 REFERENCES

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

- A. American National Standards Institute (ANSI): ANSI Z97.1 - Safety Glazing Materials Used in Buildings.

- B. ASTM International (ASTM):
1. ASTM D149 - Standard Test Method For Dielectric Breakdown Voltage And Dielectric Strength Of Solid Electrical Insulating Materials At Commercial Power Frequencies.
 2. ASTM D150 - Standard Test Methods For AC Loss Characteristics And Permittivity (Dielectric Constant) Of Solid Electrical Insulation.
 3. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
 4. ASTM D257 - Standard Test Methods for DC Resistance or Conductance of Insulating Materials.
 5. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
 6. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
 7. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
 8. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
 9. ASTM D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between minus 30 degrees C and 30 degrees C with a Vitreous Silica Dilatometer.
 10. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 11. ASTM D792 - Standard Test Methods For Density And Specific Gravity (Relative Density) Of Plastics By Displacement.
 12. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
 13. ASTM D1044 - Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser.
 14. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 15. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
 16. ASTM D3763 - Standard Test Method for High Speed Puncture Properties of Plastics Using Load and Displacement Sensors.
 17. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems.
 18. ASTM F1915 - Standard Test Methods for Glazing for Detention Facilities.
 19. ASTM F3038 - Standard Test Method for Timed Evaluation of Forced-Entry-Resistant Systems.
- C. H.P. White:
1. Test 5-aa 1 - Certification Standards for Retrofitting and Reinforcing of Standard Commercial Entry Systems, Windows, and Glazing.
 2. HPW-TP-0500.03 - Transparent Materials for Use in Forced Entry or Containment Barriers.
- D. Consumer Product Safety Commission (CPSC): CPSC 16CFR1201, Safety Standard for Architectural Glazing.
- E. Underwriters Laboratories LLC (UL):
1. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
 2. UL 972 - Standard for Burglary Resisting Glazing Material.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data:
1. Manufacturer's data sheets on each product to be used.

2. Preparation instructions and recommendations.
 3. Storage and handling requirements and recommendations.
 4. Typical installation methods.
- C. Shop Drawings: Including but not limited to details of materials, construction, finish, and relationship with adjacent construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of three years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
- C. Source Limitations: Each type of product from a single manufacturing source to ensure uniformity.

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

- D. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
1. The intent of the mock-up is to demonstrate quality of workmanship and visual appearance.
 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
 3. Retain mock-up during construction as standard for comparison with completed work.
 4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. If ambient conditions are not met at the time of delivery, the manufacturer reserves the right to void the warranty.

1.9 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Riot Glass which is located at: 17941 Brookshire Lane; Huntington Beach, CA 92647; Toll Free: 800-580-2303; Email: info@riotglass.com, Web: www.riotglass.com.

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

- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with the provisions of Section 01600.

**** NOTE TO SPECIFIER ** ArmorPlast® AR Polycarbonate Sheet is an abrasion and UV resistant sheet that offers glass-like surface hardness coupled with the impact strength of polycarbonate. Additionally, ArmorPlast AR Polycarbonate Sheet offers resistance from yellowing and hazing for longer service life in high profile applications. Typical applications for ArmorPlast include school, hospital, government, and retail store glazing. ArmorPlast is also used extensively in correctional and psychiatric facilities.**

Also ideal for retail smash and grab burglary protection, this nonballistic (containment grade) glazing shield product allows bullet penetration but won't break down or appreciably diminish in strength. Although a glazing shield does not stop bullets, it resists cracking or shattering. Even after being riddled with bullets, it remains a barrier to entry because it cannot be easily dislodged and a would-be intruder's hand is prevented from passing through to open the door, keeping intruders out of the building.

ArmorPlast® also comes in a full line of UL 752 ballistic rated options. Riot Glass® also has a full line of GCP (Glass Clad Polycarbonate) rated to UL 752 levels 1-7.

Riot Glass has a full line of retrofit framing available in clear and bronze anodize which can also be custom painted or powder coated. This is high security rated aluminum extrusions designed to withstand sustained attacks and can be installed in front of existing glazing (over glazing), behind existing glazing (back glazing), or in a conversion configurations allowing for existing single pane to be converted to security dual pane or ballistic infills.

2.2 SECURITY GLAZING

- A. Security Glass ArmorPlast AP25 Impact resistant as manufactured by Riot Glass.
1. Construction: Single layer polycarbonate sheet.
 2. Glass Thickness: Nominal 1/4 inch (6.4 mm) AR-1 sheet.
 3. Performance Requirements:
 - a. Consumer Product Safety Commission, CPSC 16CFR1201, ANSI Z97.1: Categories I and II.
 - b. General Properties:
 - 1) Thickness: 0.236 inches plus or minus 5 percent.
 - 2) Weight: 1.50 lbs per sq ft (67 Pa).
 - 3) Shading Coefficient: 0.97.
 - 4) U-Factor Winter: 0.85.
 - 5) U-Factor Summer: 0.92.
 - c. Forced Entry Testing:
 - 1) Tested in accordance with ASTM F1233.
 - 2) Listed with UL under UL 972.
 4. Standards and Code Compliance:
 - a. ASTM F1233-80.
 - b. ASTM F1914
 - c. HPW-TEST 5-aa 1.
 - d. HPW-TP-0500.03.
 - e. Miami-Dade TAS 201, 202, 203.

- f. Human Impact AAMA 501.8.
- g. UL 94 Propane Torch Test.
- h. UL 746C Suitability for Outdoor Use
- i. UL 972 Burglary Resistance.
- j. CPSC 16C FR1201 Glazing Safety Standards.
- k. ANSI Z97.1-1984 Safety Glazing.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the Manufacturer for more information.**

- 5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 7. Sheet Size: 60 x 120 inches (1524 x 3048 mm).
- 8. Sheet Size: 72 x 96 inches (1829 x 2438 mm).
- 9. Sheet Size: 72 x 120 inches (1829 x 3048 mm).
- 10. Sheet Size: ___ x ___ inches (___ x ___ mm).
- 11. Warranty: Seven years against breakage, yellowing, and hazing.
- 12. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected AR Series security are recommended.
 - b. Size panels to allow for a 1 inch (25 mm) edge engagement in the frame.
 - c. Use wet or dry sealants compatible with polycarbonates.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

B. Security Glass: ArmorPlast AP375. Forced entry and containment as manufactured by Riot Glass.

- 1. Construction: Laminates polycarbonate sheet.
- 2. Glass Thickness: 3/8 inch (9.5 mm) nominal two-ply laminate.
- 3. Properties:
 - a. Shading Coefficient: 0.92.
 - b. U-Value: 0.84.
 - c. Light Transmission: 88 percent.
 - d. Thickness: 0.375 inches (mm) plus or minus 5 percent.
 - e. Weight: 2.3 lbs per sq ft (Pa)
- 4. Security Ratings:
 - a. Forced Entry Containment.
 - b. UL 972 Burglary Resistant Glazing.
 - c. ASTM F 1915 Grade 3.
- 5. Code Compliance: Certifications.
 - a. ANSI Z97.1 Safety Glazing.
 - b. CPSC 16 CFR 1201 CAT I and II.
 - c. FBC High Velocity Hurricane Zone.
 - d. UL 746C: Sustainability for Outdoor Use.
 - e. AAMA 501.8: Resistance to Human Impact

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 6. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 7. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 8. Sheet Size: 60 x 120 inches (1524 x 3048 mm).
- 9. Sheet Size: 72 x 96 inches (1829 x 2438 mm).
- 10. Sheet Size: 72 x 120 inches (1829 x 3048 mm).
- 11. Sheet Size: ___ x ___ inches (___ x ___ mm).
- 12. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.

- b. Laminate should be cut to allow for a minimum of 3/4 inch (19 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
13. Warranty: Seven years against breakage, yellowing, and hazing.
- C. Security Glass: ArmorPlast AP375BR Ballistic and forced entry grade as manufactured by Riot Glass.
- 1. Construction: Laminates polycarbonate sheet.
 - 2. Glass Thickness: 3/8 inch three-ply laminate.
 - 3. Properties:
 - a. U-Value: 0.80.
 - b. Shading Coefficient: 0.92.
 - c. Light Transmission: 88 percent.
 - d. Thickness: 0.390 inches (13.26 mm) plus or minus 5 percent.
 - e. Weight: 2.4 lbs per sq ft (Pa).
 - 4. Performance Requirements:
 - a. Ballistic:
 - 1) ASTM F1233-08, Level HG1 .38 Special LRN
 - 2) HPW-TP 0500.03, Level A.
 - b. Forced Entry and Containment:
 - 1) ASTM F 1233.08:
 - a) Class 1.5 Contraband passage.
 - b) Class 3.2 Body passage.
 - 2) ASTM F1915.03 Grade 3.
 - 3) H.P. White TP 0500.03 Level 1 Sequence 15.
 - 4) WMFL Level III
- ** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**
- 5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
 - 6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
 - 7. Sheet Size: 72 x 96 inches (x 2438 mm).
 - 8. Sheet Size: ___ x ___ inches (___ x ___ mm).
 - 9. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. Laminate should be cut to allow for a minimum of 1 inch (25 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
 - 10. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.
- D. Security Glass: ArmorPlast AP50BR Forced entry and light ballistic grade as manufactured by Riot Glass.
- 1. Construction: Laminates polycarbonate sheet.
 - 2. Glass Thickness: 1/2 inch three-ply laminate.
 - 3. Properties:
 - a. U-Value: 0.74.
 - b. Shading Coefficient: 0.90.
 - c. Light Transmission: 83 percent.
 - d. Thickness: 0.522 inches (13.26 mm) plus or minus 5 percent.

- e. Weight: 3.3 lbs per sq ft (158 Pa).
- 4. Performance Requirements:
 - a. Ballistic:
 - 1) ASTM F1233-08, Level HG1.
 - b. Forced Entry and Containment:
 - 1) ASTM F 1233.08:
 - a) Class 1.5 Contraband passage.
 - b) Class 3.2 Body passage.
 - 2) ASTM F1915.03 Grade 1.
 - 3) H.P. White TP 0500.03 Level 1 Sequence 15.
 - c. Agency Information:
 - 1) Combustibility Class CC1.
 - 2) International Building Code 2018;
 - 3) Miami-Dade NOA No. 15-1014.01.
 - 4) Florida Building Code 2017.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 5. Sheet Size: 38 x 96 inches (965 x 2438 mm).
- 6. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 7. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 8. Sheet Size: ___ x ___ inches (___ x ___ mm).
- 9. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. Laminate should be cut to allow for a minimum of 3/4 inch (19 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
- 10. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.

E. Security Glass: ArmorPlast AP75BR Forced entry and ballistic grade as manufactured by Riot Glass.

- 1. Construction: Laminates polycarbonate sheet.
- 2. Glass Thickness: 3/4 inch three-ply laminate.
- 3. Properties:
 - a. U-Value: 0.65.
 - b. Shading Coefficient: 0.89.
 - c. Light Transmission: 88 percent.
 - d. Thickness: 0.780 inches (19.0 mm) plus or minus 5 percent.
 - e. Weight: 5.1 lbs per sq ft (Pa).
- 4. Performance Requirements:
 - a. Ballistic: UL 752 Level 1 (9mm 124 grain Full Metal Copper Jacket with lead).
 - b. Safety:
 - 1) Combustibility Class CC2.
 - 2) Florida Building Code 2017.
 - 3) Miami-Dade NOA: NOA.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 7. Sheet Size: 72 x 96 inches (x 2438 mm).
- 8. Sheet Size: ___ x ___ inches (___ x ___ mm).

9. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. Laminate should be cut to allow for a minimum of 3/4 inch (19 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
10. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.

F. Security Glass: ArmorPlast AP100BR Level 2 Forced entry and ballistic grade as manufactured by Riot Glass.

1. Construction: Laminates polycarbonate sheet.
2. Glass Thickness: 1 inch four-ply laminate.
3. Properties:
 - a. U-Value: 0.60.
 - b. Shading Coefficient: 0.85.
 - c. Light Transmission: 72 percent.
 - d. Thickness: 1.05 inches (26.67) plus or minus 5 percent.
 - e. Weight: 6.5 lbs per sq ft (311 Pa).
4. Performance Requirements:
 - a. Ballistic: UL 752 Level 2. 3357 Magnum158 Grain jacketed lead soft point.
 - b. Forced Entry and Containment:
 - 1) ASTM F 1233.08:
 - a) Class 5 Body Passage.
 - b) Class 2.4 Contraband Passage.
 - 2) ASTM F1915.03 Grade 1.
 - 3) H.P. White TP 0500.03 Level IV Sequence 43.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
7. Sheet Size: 72 x 96 inches (x 2438 mm).
8. Sheet Size: ___ x ___ inches (___ x ___ mm).
Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. Laminate should be cut to allow for a minimum of 1 inch (25 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
9. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.

G. Security Glass: ArmorPlast AP100BR Level 3 Forced entry and ballistic grade as manufactured by Riot Glass.

1. Construction: Laminates polycarbonate sheet.
2. Glass Thickness: 1 inch four-ply laminate.
3. Properties:
 - a. U-Value: 0.60.
 - b. Shading Coefficient: 0.85.
 - c. Light Transmission: 72 percent.

- d. Thickness: 1.05 inches (26.67) plus or minus 5 percent.
- e. Weight: 6.5 lbs per sq ft (311 Pa).
- 4. Performance Requirements:
 - a. Ballistic: UL 752 Level 3. .44 Magnum 240 Grain.
 - b. Forced Entry and Containment:
 - 1) ASTM F 1233.08:
 - a) Class 5 Body Passage.
 - b) Class 2.4 Contraband Passage.
 - 2) ASTM F1915.03 Grade 1.
 - 3) H.P. White TP 0500.03 Level IV Sequence 43.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 7. Sheet Size: 72 x 96 inches (x 2438 mm).
- 8. Sheet Size: ___ x ___ inches (___ x ___ mm).
- 9. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. Laminate should be cut to allow for a minimum of 1 inch (25 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - c. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
- 10. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.

H. Security Glass: ArmorPlast AP125BR Ballistic grade as manufactured by Riot Glass.

- 1. Construction: Laminates polycarbonate sheet.
- 2. Glass Thickness: 1.30 inch (mm) four-ply laminate.
- 3. Properties:
 - a. U-Value: 0.56.
 - b. Shading Coefficient: 0.98.
 - c. Light Transmission: 78 percent.
 - d. Thickness: 1.30 inches (31.75 mm) plus or minus 5 percent.
 - e. Weight: 8.1 lbs per sq ft (388 Pa).
- 4. Performance Requirements:
 - a. Ballistic: UL 752 Level 6.
 - 1) Multiple shots from a sub-machine gun, such as a 9 mm Uzi, with muzzle energy 540 to 653 ft-lbs (732 to 885 J).
 - 2) Supplementary Shotgun: UL test using rifled lead slug with a muzzle energy of 2438-2950 ft-lbs (3306-4000 J).
 - 3) 00 lead buckshot with a muzzle energy of 2078-2415 ft-lbs (2818-3275 J) from a 12-gauge shotgun.
 - b. Agency Information:
 - 1) Combustibility Class CC2.
 - 2) Miami-Dade NOA: NOA.
 - 3) Florida Building Code 2017.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 5. Sheet Size: 48 x 96 inches (1219 x 2438 mm).
- 6. Sheet Size: 60 x 96 inches (1524 x 2438 mm).
- 7. Sheet Size: 72 x 96 inches (x 2438 mm).
- 8. Sheet Size: ___ x ___ inches (___ x ___ mm).

9. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings as the selected laminate are recommended.
 - b. ArmorPlast125MS must be installed with acrylic ply facing the ballistic attack side.
 - c. Laminate should be cut to allow for a minimum of 1 inch (25 mm) edge engagement in the frame, with sufficient rabbet depth for material expansion; approx. 1/16 inch per ft (5 mm per m).
 - d. Use wet or dry sealants and gaskets compatible with polycarbonate.
 - e. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
 10. Warranty: Seven years from date of manufacture against coating failure, yellowing, and hazing.
- I. Ballistic Glass: ArmorPlast RG1 LS Ballistic grade as manufactured by Riot Glass. A multi-ply glass-clad polycarbonate laminate.
1. Thickness: 0.726 inches (mm) plus or minus 5 percent.
 2. Weight: 7.49 lbs per sq ft
 3. Light Transmission: 84 percent.
 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
 5. Ratings:
 - a. Ballistic: UL 752 Level 1 (Mod) – 9mm 124 Grain
 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

1. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
 2. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
- J. Ballistic Glass: ArmorPlast RG2 LS Ballistic grade as manufactured by Riot Glass. A multi-ply glass-clad polycarbonate laminate.
1. Thickness: 1.03 inches (mm) plus or minus 5 percent.
 2. Weight: 11.54 lbs per sq ft
 3. Light Transmission: 75 percent.
 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
 5. Ratings:
 - a. Ballistic: UL 752 Level 2 (Mod) .357 Mag
 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

1. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
2. Glazing Recommendations:

- a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.
- K. Ballistic Glass: ArmorPlast RG3 LS Ballistic grade as manufactured by Riot Glass. A multi-ply glass-clad polycarbonate laminate.
- 1. Thickness: 1.202 inches (mm) plus or minus 5 percent.
 - 2. Weight: 13.03 lbs per sq ft
 - 3. Light Transmission: 75 percent.
 - 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
 - 5. Ratings:
 - a. Ballistic: UL 752 Level 2 (Mod) .357 Mag
 - 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172
 - d. HP White.

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

- 7. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
- 8. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

- L. Ballistic Glass: ArmorPlast RG4 LS Ballistic grade as manufactured by Riot Glass. A multi-ply glass-clad polycarbonate laminate.
- 1. Thickness: 1.291 inches (mm) plus or minus 5 percent.
 - 2. Weight: 14.18 lbs per sq ft
 - 3. Light Transmission: 75 percent.
 - 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
 - 5. Ratings:
 - a. Ballistic: UL 752 Level 4 (Mod) .30-06 180 grain
 - 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172
 - d. HP White.

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

- 7. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
- 8. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.

- c. Use wet or dry sealants compatible with laminated glass.
- d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

M. Ballistic Glass: ArmorPlast RG5 LS Ballistic grade as manufactured by Riot Glass. A multiply glass-clad polycarbonate laminate.

- 1. Thickness: 1.308 inches (mm) plus or minus 5 percent.
- 2. Weight: 14.3 lbs per sq ft
- 3. Light Transmission: 67 percent.
- 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
- 5. Ratings:
 - a. Ballistic: UL 752 Level 5 (Mod) 7.62 x 51 mm 150 Grain ASTM M80 Ball Copper Jacket.
- 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

- 7. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
- 8. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

N. Ballistic Glass: ArmorPlast RG6 LS Ballistic grade as manufactured by Riot Glass. A multiply glass-clad polycarbonate laminate.

- 1. Thickness: 1.54 inches (mm) plus or minus 5 percent.
- 2. Weight: 17.22 lbs per sq ft
- 3. Light Transmission: 67 percent.
- 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
- 5. Ratings:
 - a. Ballistic: UL 752 Level 6 (Mod) 9 mm 124 grain.
- 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

- 7. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
- 8. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

- O. Ballistic Glass: ArmorPlast RG7 LS Ballistic grade as manufactured by Riot Glass. A multi-ply glass-clad polycarbonate laminate.
 - 1. Thickness: 1.52 inches (mm) plus or minus 5 percent.
 - 2. Weight: 17.2 lbs per sq ft
 - 3. Light Transmission: 67 percent.
 - 4. Warranty: Five year limited product warranty against coating failure, yellowing, delamination, and hazing.
 - 5. Ratings:
 - a. Ballistic: UL 752 Level 7 (Mod) 5.56 mm M193 ball.
 - 6. Safety Glazing:
 - a. ANSI Z971.1984,
 - b. ASTM C 1036
 - c. ASTM 1172

**** NOTE TO SPECIFIER ** RG Series panels are made to order and not available in standard sizes. Call for current pricing and availability.**

- 7. Sheet Panel Size: ___ x ___ inches (___ x ___ mm).
- 8. Glazing Recommendations:
 - a. Structural security framing systems with equal or greater forced entry and/or ballistics ratings to the selected RG Series laminate are recommended.
 - b. RG laminates should be ordered to allow for a minimum of one inch edge engagement in the frame.
 - c. Use wet or dry sealants compatible with laminated glass.
 - d. Remove protective masking after glazing operations are completed and before prolonged exposure to direct sunlight, moisture, or high temperature.

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

2.3 SECURITY GLAZING – INSULATING GLASS UNITS

- A. Security Glass: ArmorPlast AP375 1 IGU Security Glass as manufactured by Riot Glass.
 - 1. Ratings:
 - a. CPSC 16 CFR 1201 Category I and Category II: Safety Standard for Architectural Glazing Materials.
 - b. Florida Building Code High Velocity Hurricane Zone Classified Miami-Dade NOA: NOA.
 - c. UL 94: Flammability File No. E87887.
 - d. UL 972: Burglary Resistant Glazing Materials.
 - e. UL 746C: Suitability for Outdoor Use, UL File No. E87887.
 - f. AAMA 501.8: Resistance to Human Impact of Windows Systems Intended for Use in Psychiatric Applications.
 - 2. Glass Components:
 - a. Layer 1: ArmorPlast AP375 : Nominal 3/8 inch (9.5 mm) thick.
 - b. Layer 2: Air Gap: 3/8 inches (9.5 mm).
 - c. Layer 3: Heat Tempered Glass: 1/4 inch thick (6.35 mm).
 - 1) Heat Strengthened.
 - 3. Properties:
 - a. Protection: Forced Entry.
 - b. Ballistic Data: N/A.
 - c. Light Transmission: 84 percent.
 - d. Thickness: 1 inch (25.4 mm).
 - e. Weight: 5.27 lbs per sq ft (2532.3 Pa).
 - f. Dimensional Tolerance: ASTM C1349.
 - 4. Code Compliance:
 - a. ANSI Z971.1-2009, 2015 Safety Glazing Materials for Buildings.
 - b. ASTM C1036 Standard Specifications for Flat Glass.
 - c. ASTM C1172 Standard Specification for Laminated Architectural Flat Glass.

**** NOTE TO SPECIFIER ** Delete options not required. Contact the manufacturer for a full list of options available.**

5. Options:
 - a. Clear.
 - b. Reflective glass.
 - c. One-way mirror.
 - d. Translucent white interlayer (frosted layer).
 - e. Tint: Gray.
 - f. Tint: Bronze.
 - g. Tint: Green.
 - h. Tint: Blue.
 - i. Wire glass.
 - j. Insulating units.
 - k. Low E.

**** NOTE TO SPECIFIER ** Delete sheet size options not required. Custom Sizes are available. Contact the manufacturer for more information.**

6. Sheet Size: As required to meet window dimensions as detailed and supplied to the Manufacturer.
7. Sheet Size: ___ x ___ inches (___ x ___ mm).
8. Warranty: Five years from date of manufacture.

B. Security Glass: ArmorPlast AP375-BR1 IGU Security Glass as manufactured by Riot Glass.

1. Ballistics and Forced Entry Rating:
 - a. ASTM f 1233-93 Class III (sequence 12) – Forced entry.
 - b. H.P. White TP-0500.01 Level II (step 10) – Forced entry.
 - c. H.P. White Level A Ballistics - .38 Special.
 - d. WMFL Level 3 – 30 minute Physical attack.
2. Glass Components:
 - a. Layer 1: ArmorPlast AP375 : Nominal 3/8 inch thick.
 - b. Layer 2: Air Gap: 3/8 inches (9.5 mm).
 - c. Layer 3: Heat Tempered Glass: 1/4 inch (6.35 mm) thick.

**** NOTE TO SPECIFIER ** Heat strengthened glass is optional. Delete if not required.**

- 1) Heat Strengthened.
3. Properties:
 - a. Protection: Forced Entry.
 - b. Ballistic Data: HP White Level A Ballistics; .38 special.
 - c. Light Transmission: 84 percent.
 - d. Thickness: 1 inch (25 mm).
 - e. Weight: 5.27 lbs per sq ft (252.3 Pa).
 - f. Dimensional Tolerance: ASTM C1349
4. Code Compliance:
 - a. ANSI Z971.1984 Safety Glazing Materials for Buildings.
 - b. ASTM C 1036 Standard Specifications for Flat Glass.
 - c. ASTM C 1172 Standard Specification for Laminated Architectural Flat Glass.

**** NOTE TO SPECIFIER ** Delete options not required. Contact the manufacturer for a full list of options available.**

5. Options:
 - a. Clear.
 - b. Reflective glass.
 - c. One-way mirror.
 - d. Translucent white interlayer (frosted layer).
 - e. Tint: Gray.
 - f. Tint: Bronze.
 - g. Tint: Green.
 - h. Tint: Blue.
 - i. Wire glass.

- j. Insulating units.
- k. Low E.

**** NOTE TO SPECIFIER ** Delete sheet size option not required. Custom Sizes are available. Contact the manufacturer for more information.**

- 6. Sheet Size: As required to meet window dimensions as detailed and supplied to the Manufacturer.
- 7. Sheet Size: ___ x ___ inches (___ x ___ mm).
- 8. Warranty: Five years from date of manufacture.

2.4 FRAMING SYSTEM

A. Framing Systems:

- 1. Polycarbonate glazing and aluminum framing are cut to required sizes based on provided window measurements to the manufacturer.
- 2. Items are shipped as 'kits' ready for installation.

**** NOTE TO SPECIFIER ** Riot Glass offers to clients, access to proprietary video which explains in simple detail how to measure and document existing window sizes so the appropriate kits may be supplied, Riot Glass also supplies access to proprietary video for kit installation.**

- 3. Framing: Extruded aluminum, Alloy 6063-T5.
 - a. Hardware: Tamper resistant hardware concealed by low-profile, protective cover.

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

- b. Mounting on Doors: Surface mount, interior.
- c. Mounting on Doors: Surface mount, exterior.
- d. Mounting on Storefront: Surface mount, interior.
- e. Mounting on Storefront: Surface mount, exterior.
- f. Mounting on Storefront: Full frame, interior.
- g. Mounting on Storefront: Full frame, exterior.
- h. Mounting on Curtainwall: Surface mount, exterior.
- i. Mounting on Curtainwall: Full frame, interior.
- j. Mounting on Curtainwall: Full frame, exterior.

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

- k. Finish: Clear anodized.
- l. Finish: Bronze anodized.
- m. Finish: As selected by Architect.

2.5 COMPRESSION WINDOW SYSTEMS

A. Product: ArmorPlast AP375 J-Series Compression Framing Systems. A method of attachment that does not involve penetration of the surrounding substrate.

- 1. Standards Compliance:
 - a. ASTM F3038 - Standard Test Method for Timed Evaluation of Forced-Entry-Resistant Systems
 - 1) Section 16 of ASTM F3038: Passed
- 2. Compression Framing:
 - a. J-Series Mounting Bars: Designed to expand inside a recessed opening providing a solid mounting structure for security window framework.
 - b. Mounting Bars: Located between existing windows and the proposed security window framework on the exterior of the building.
 - c. Expansion: Achieved by turning a keyed spindle connected to a high-ratio worm drive delivering up to 3000 lbs of expansion force. Two horizontal compression frames are proposed per window opening.
- 3. Silicon Friction Shoes:
 - a. As pressure is applied to the expansion bars the rubber shoes pivot into the surrounding substrate causing a high level of friction and resistance to movement without damage to the substrate.

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

For oversized storefront windows. Installs vertically or horizontally between existing storefront framework, interior or exterior. Starter mullions allow for the installation of Gen II security panels in openings that would otherwise be too large for ArmorPlast's maximum sheet sizes. Attached with shear blocks and finished with a snap cover for a finished look. Gen II framework is attached directly to the starter mullion. Gen II starter mullions are perfect for build-out applications and can be used on any storefront.

2.6 STOREFRONT SECURITY SYSTEMS (ARMORPLAST GEN II)

- A. Performance and Design Requirements
1. ArmorPlast Gen II Security Systems by Riot Glass, LLC:
 2. Framing: Extruded 6063 T-5 aluminum with heavy gauge walls; twice the thickness of most storefront framing members.
 - a. Provide a solid mount for security infill panels.
 - b. Strengthen the underlying storefront structure when installed in accordance with manufacturer's specifications.
 - c. Allow natural expansion and contraction of polymer security panels to minimize distortion.
 - 1) Captured panels move freely inside the Gen II framework resulting in maximum shock dissipation.
 3. ArmorPlast Security Panels: Extruded polymer with high-impact resistance and crystal clear optics.
 4. Pressure Temperature Balance:
 - a. Systems mitigate condensation by utilizing a passive ventilation process. The newly formed cavity created between the existing glass and the new security glazing is susceptible to moisture condensation during extreme temperature differences.
 - b. By allowing the outside ambient atmosphere to connect to the air in the cavity, the pressure and temperature are equalized. Thus, any fogging from condensation will occur on the first surface inside the building where it can evaporate or be easily removed.
 - 1) On hot days, air is drawn out of the top vents equalizing the pressure and eliminating infill panel distortion. Bottom weep holes provide input ventilation and water drainage. Moisture is to collect in the system tray.
- B. Product: AP2-DC. ArmorPlast Door Conversion Series for Aluminum Framed Door. Heavy duty series storefront security system for 3/8, 3/4, 1 inch glazing and up to 1 inch insulated glazing security infills.
1. Forced entry protection and/or ballistic security up to Level 3.
 - a. Replaces existing door glass.
 - b. Fits 1-3/4 inch (mm) thick aluminum framed doors.
 - c. Requires removable glass stops.
 - d. Can also be used as a back glaze solution on framing wide enough to accommodate the base extrusion.
- C. Product: AP2-STD-SF. ArmorPlast Standard Over Glaze or Back Glaze storefront security system for 1/4 and 3/8 inch security infills.
1. Forced entry protection and/or ballistic security up to Level 3.
 - a. Installed in front of the glass on the attack side (over glazing) or over the back side (safe side) of the glass (back glazing).
 - b. Fits most center mount storefront systems.
- D. Product: AP2-HD-SF. ArmorPlast Heavy Duty Over Glaze or Back Glaze storefront security system for 3/8, 3/4, 1 inch glazing and up to 1 inch insulated glazing security infills.
1. Forced entry protection and/or ballistic security up to Level 3.

- a. Installed in front of the glass on the attack side (over glazing) or more commonly over the back side (safe side) of the glass (back glazing)
 - b. Fits most center mount storefront and curtain wall systems
 - c. Features a notch in the base extrusion to allow for closer mounting to the glass surface without contacting the gasket/vinyl.
- E. Product: AP2-HD-CONV. ArmorPlast Heavy Duty Storefront Conversion security system for 3/8, 3/4, 1 inch glazing and up to 1 inch insulated glazing security infills.
- 1. Forced entry protection and/or ballistic security up to Level 3.
 - a. Replaces the glass. Original glass and gaskets are removed and the conversion framing is installed over the existing framing pocket.
 - b. Fits most center mount storefront and some curtain wall systems.
 - c. Features a leg extending from the base extrusion for stability over wider pockets in existing frame.
- F. Product: AP2-HG-CONV. ArmorPlast Heavy Glass Storefront Conversion security system up to 1-1/2 inch ballistic infills.
- 1. Ballistic security up to Level 7.
 - a. Replaces the glass. Original glass and gaskets are removed and the conversion framing is installed over the existing framing pocket.
 - b. Fits most center mount storefront and some curtain wall systems.
 - c. The widest base extrusion offered allows for thicker ballistic AP or RG series infills up to UL 752 Level 7 (modified spec).
 - d. Gaskets can be used for most infills, but a 1-1/2 inch infill will require a wet glazed application in lieu of vinyl.
- G. Starter Mullions: For oversized storefront windows.
- 1. Installs vertically or horizontally between existing storefront framework, interior or exterior.
 - 2. Allow for installation of Gen II security panels in openings otherwise too large for ArmorPlast's maximum sheet sizes.
 - 3. Attached with shear blocks and finished with a snap cover for a finished look.
 - 4. Gen II framework is attached directly to the starter mullion.
 - 5. Can be used on any storefront.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare openings and substrates using the methods recommended by the manufacturer for achieving the best result for the substrates under project conditions.
- B. Do not proceed with installation until openings and substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals and in proper relationship with adjacent construction.
 - 1. Install components plumb and true in alignment with established lines, without warp or rack.
 - 2. Fit joints to produce hairline joints free of burrs and distortion.

3.3 CLEANING AND PROTECTION

- A. Clean and protect products in accordance with the manufacturer's recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION