



PIONEER SQUARE PRISM GLASS DESIGN MANUAL

ALLIANCE FOR PIONEER SQUARE

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CREDITS

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Community Stakeholders

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Department of Neighborhoods
Pioneer Square Preservation Board
Pioneer Square Residents Council
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TABLE OF CONTENTS

Pioneer Square Prism Glass Design Manual

Introduction.....	5
Why is this Document Needed?	5
Areaway Components.....	6
A Note about the Color of Prism Glass.....	7
Prism Glass Panel Construction	8
How Do I Steward the Prism Glass Panels	10
Resource Documents	12
Areaways and Prism Glass	12
Permitting Guidance	12
Prism Glass Manufacturers.....	13
Case Study Appendix.....	14

HOW TO USE THIS MANUAL

This design manual is intended as a tool to help Pioneer Square property owners efficiently steward, repair, and maintain the historic prism glass that is a defining element of our neighborhood's public realm.

Developers & their design teams can find guidance and suggestions for how their projects—whether new construction or rehabilitation—can improve the conditions of the prism glass throughout the neighborhood by working with SDOT and the Pioneer Square Preservation Board.

Neighbors, businesses and preservationists can help improve the neighborhood's public realm by sharing this resource with property owners to help improve their sidewalk's condition.

INTRODUCTION

This Pioneer Square Prism Glass Design Manual is a guide for property owners, developers, designers, and engineers who are working to enhance the physical appearance of the prism glass panels that define the sidewalks in the Pioneer Square neighborhood.

While each property and its adjacent prism glass is unique, this document provides general guidance that will help property owners improve these glass panels by:

- serving as a central resource for information about the prism glass panels;
- describing the evaluation and permitting/approval process for repairing and/or replacing the glass panels;
- understanding who to contact about the condition of the prism panels and the roles of different organizations;
- documenting the known manufacturers and installers of prism glass panels.

WHY IS THIS DOCUMENT NEEDED?

The glass prisms throughout Pioneer Square are more than a mere curiosity. They are an integral expression of Seattle's boomtown legacy, reminding our community of the Great Fire and the resilient rebuilding that happened afterward. For many residents, the prism glass panels define the neighborhood's walking experience, and are a cherished and protected resource. They are stewarded by property owners with approval/regulatory authority from both the Seattle Department of Transportation (SDOT) and the Pioneer Square Preservation Board (PSPB).

As noted in the Seattle University *Seattle Prism Light Reconnaissance Study*, maintaining the sidewalks is the responsibility of the property owner, including maintenance of the glass prisms. This distributed ownership and stewardship arrangement means that information and lessons learned are not shared across ownerships and property managers.

With this lack of information, many property owners are stymied by not knowing where to begin when thinking about how to repair or restore the prism glass panels.

Unfortunately, this means that the prism glass are often left to deteriorate, raising accessibility

(ADA) compliance concerns, creating public safety risks, and eroding the public's perception of this valued resource.

To help protect these historic resources and raise the public's perception of the glass prisms, this document provides a roadmap and offers instructive resources to property owners and neighborhood constituents about how to maintain, steward, and improve the prism glass panels.



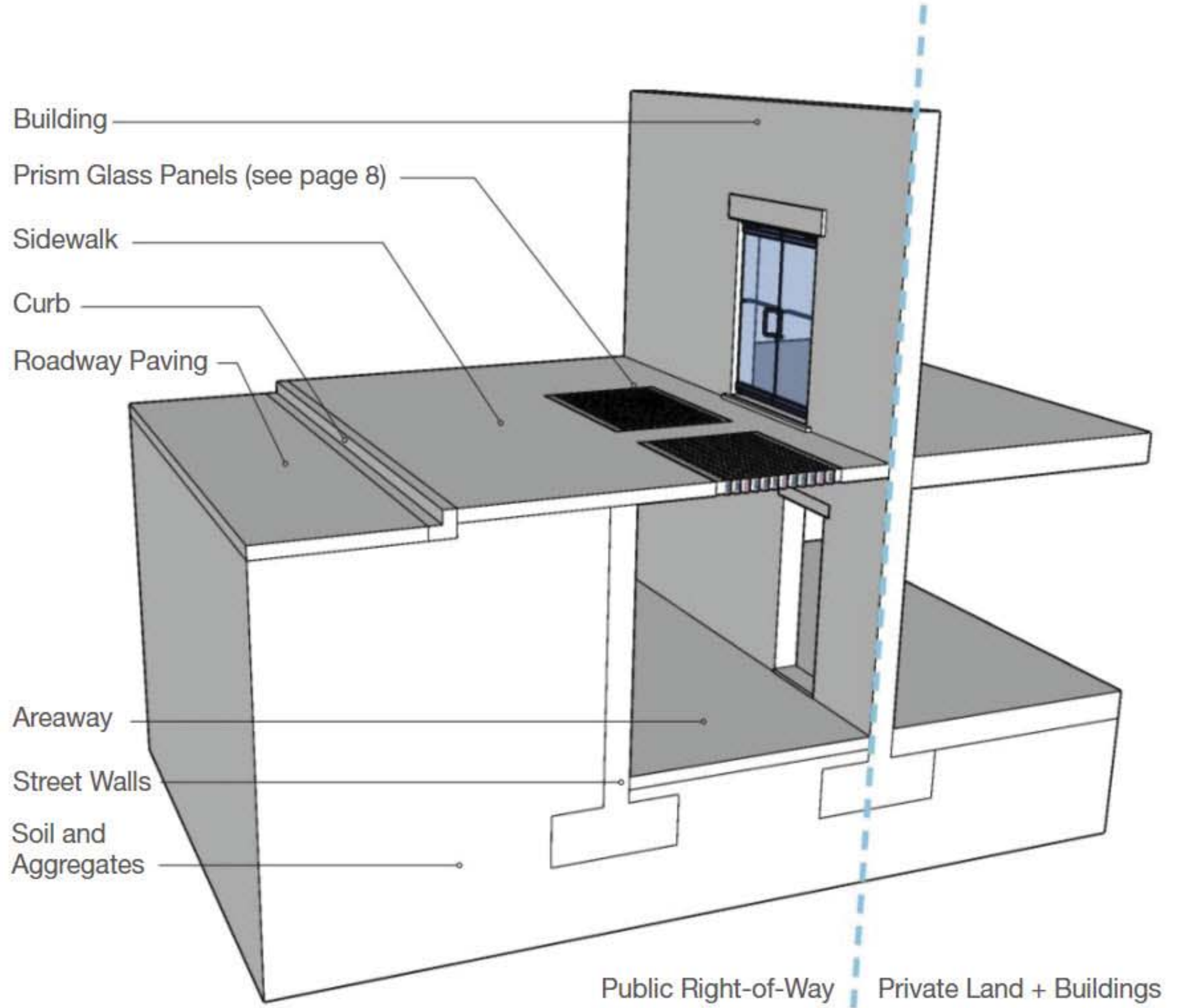
Everyday, residents, business owners, and visitors traverse the prism glass of Pioneer Square. Their stewardship helps maintain the well-kept feel of the neighborhood. (Image by Lindsey Miller)

AREAWAY COMPONENTS

To understand how prism glass components fit within Pioneer Square’s overall pedestrian realm it is important to understand how they are an integral part of the neighborhood’s history.

SDOT’s Pioneer Square Historic District Areaways Hazard Mitigation Study describes the history of the areaways as such: “In some older Pioneer Square buildings, the areaways were created when the city raised the level of the streets in rebuilding after the Great Fire of 1889. Buildings constructed in Pioneer Square in later years, followed this pattern, typically constructing areas to provide additional space. Areaways vary in size, but are typically ten feet high and ten feet wide, running the length of the building.”

The conceptual diagram at right provides a basic understanding of the areaway components that help support the prism glass panels. On the following pages a map of the district’s areaways and a set of diagrams of how the individual panels are assembled are presented.



A NOTE ABOUT THE COLOR OF GLASS PRISMS

When originally manufactured and installed, most of the prism glass in Pioneer Square was clear, allowing the most light to penetrate into darkened areaways. Today, the glass prisms are a variety of colors. Ultraviolet rays and the manganese in the glass have often reacted to create purple tinted glass.

Many glass panels have also been covered in various pavement types. Depending on the chemical interaction between the glass bricks and the pavement, the glass prisms may be discolored. This determination should be made on a case-by-case basis, as the Secretary of Interior's Standards prefer repair of the authentic material over replacement.

Since most of the glass in the district is purple, the Pioneer Square Preservation Board often requires replacement glass panels and blocks to also be purple for aesthetic consistency and to comply with the Secretary of Interior's Standards for rehabilitation to replace in-kind.

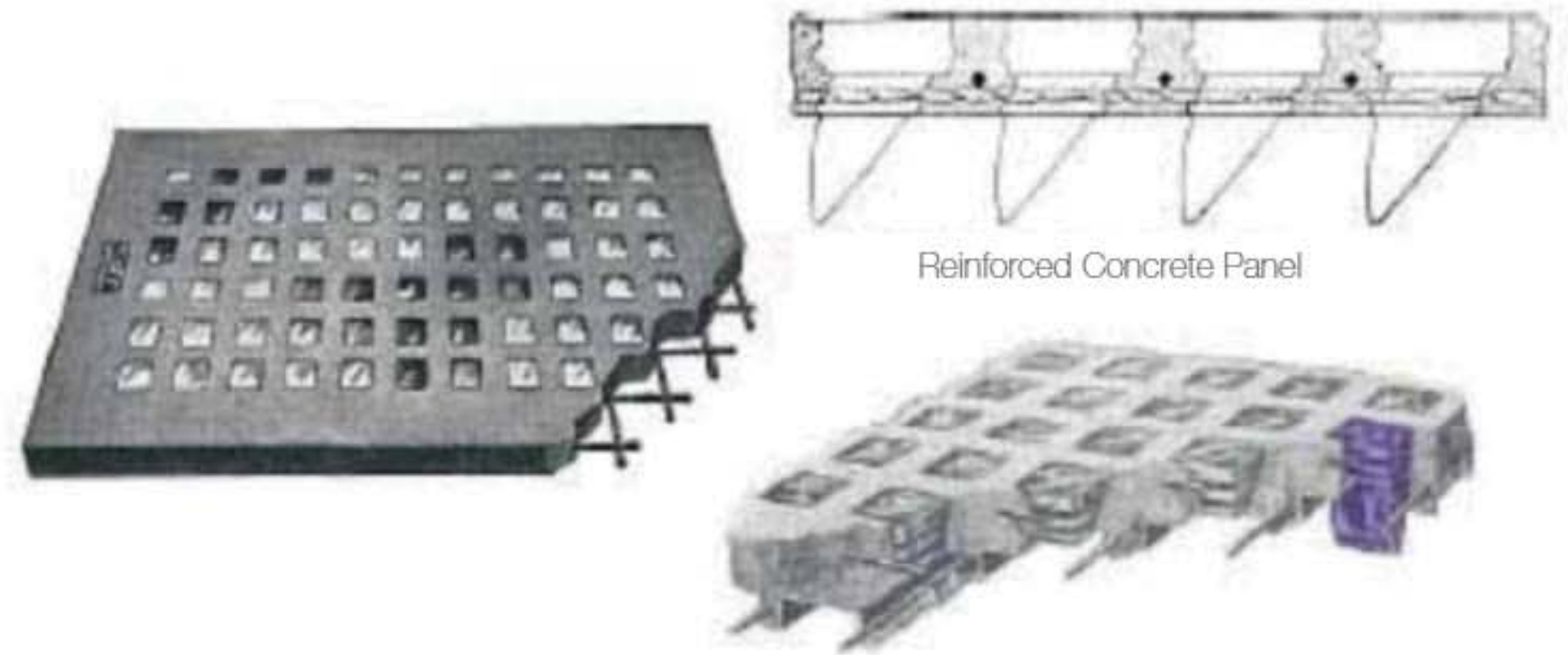


Map of Pioneer Square's Areaways and their Structural Ratings from the 2003 SDOT Pioneer Square Historic District Areaways Hazard Mitigation Study

PRISM GLASS PANEL CONSTRUCTION

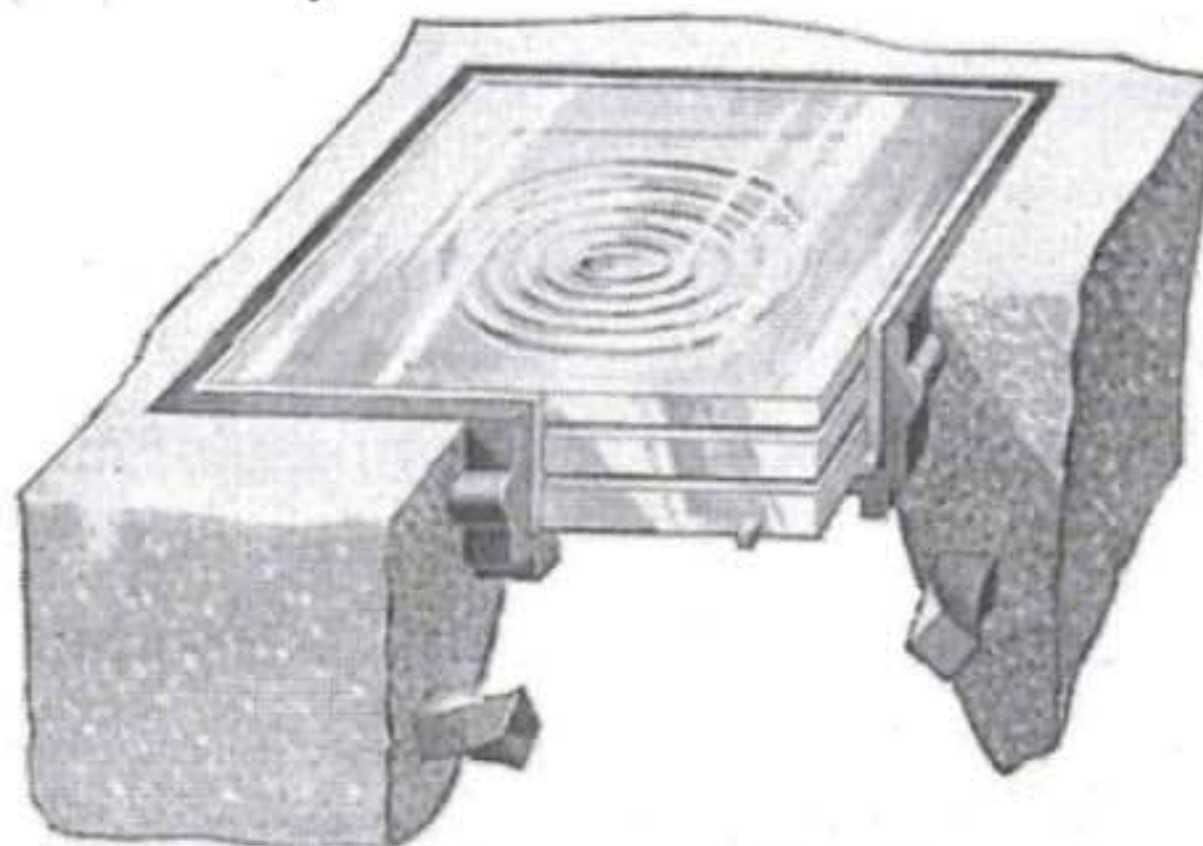
Prism glass panels are built using one of two basic construction techniques. Cast iron construction embeds the prism glass into a cast iron metal panel, which is less common in Pioneer Square. The second, more common construction technique, embeds prism glass in precast, reinforced concrete panels, shown here. On page 9 both construction types are shown.

SDOT's current requirements for structural loading often exceed the original design loads for both of these panel systems, requiring additional structural support for these panels in the areaway.

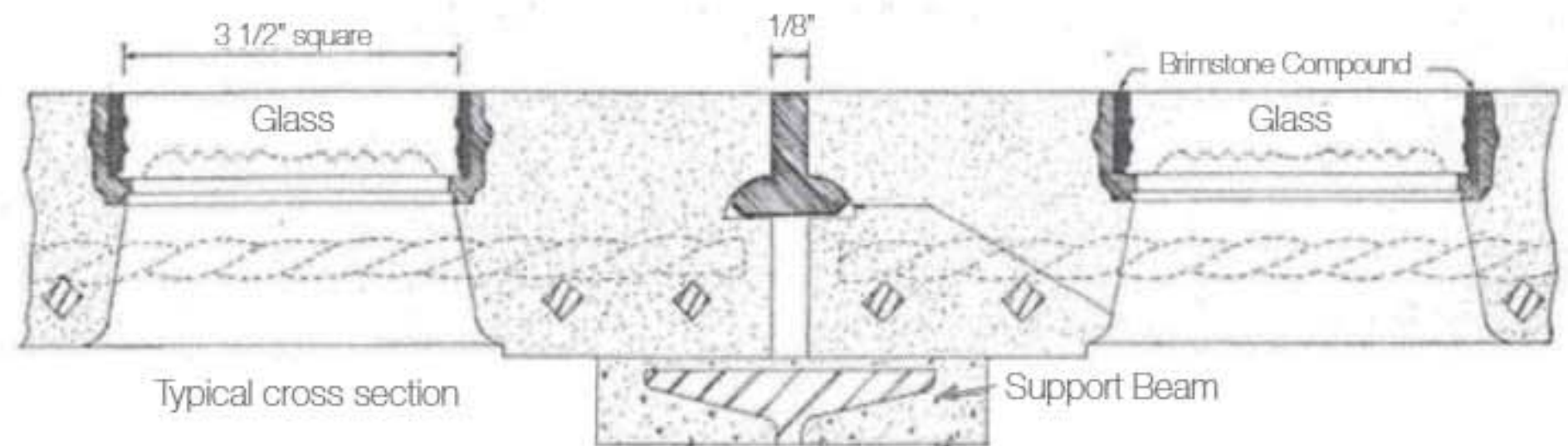


Reinforced Concrete Panel

An excerpt from the 2011 Seattle University Seattle Prism Light Reconnaissance Study shows how the prism glass rest within a concrete panel.



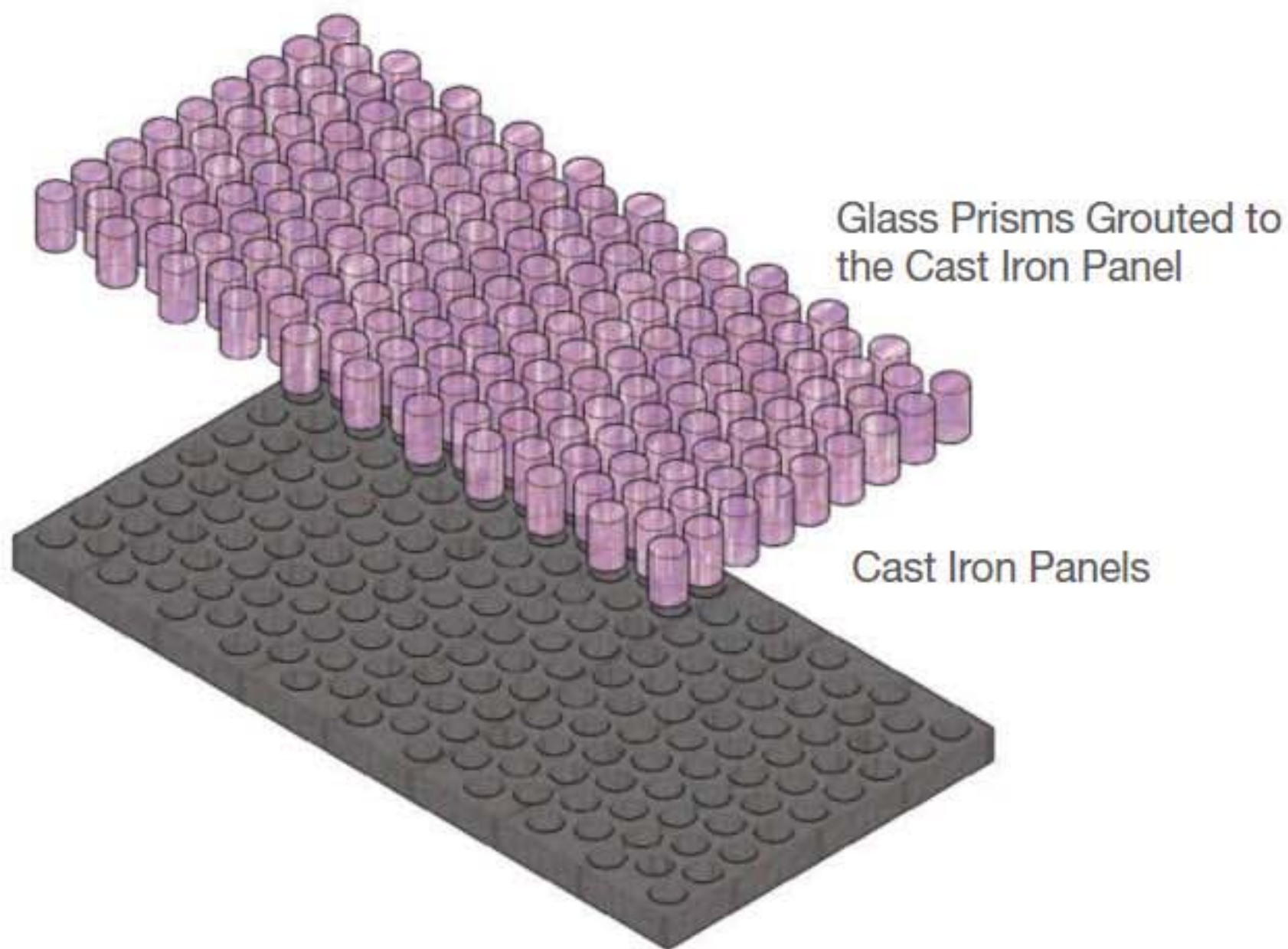
Cut-away view of 3-way armored glass, showing shield embedded in concrete.



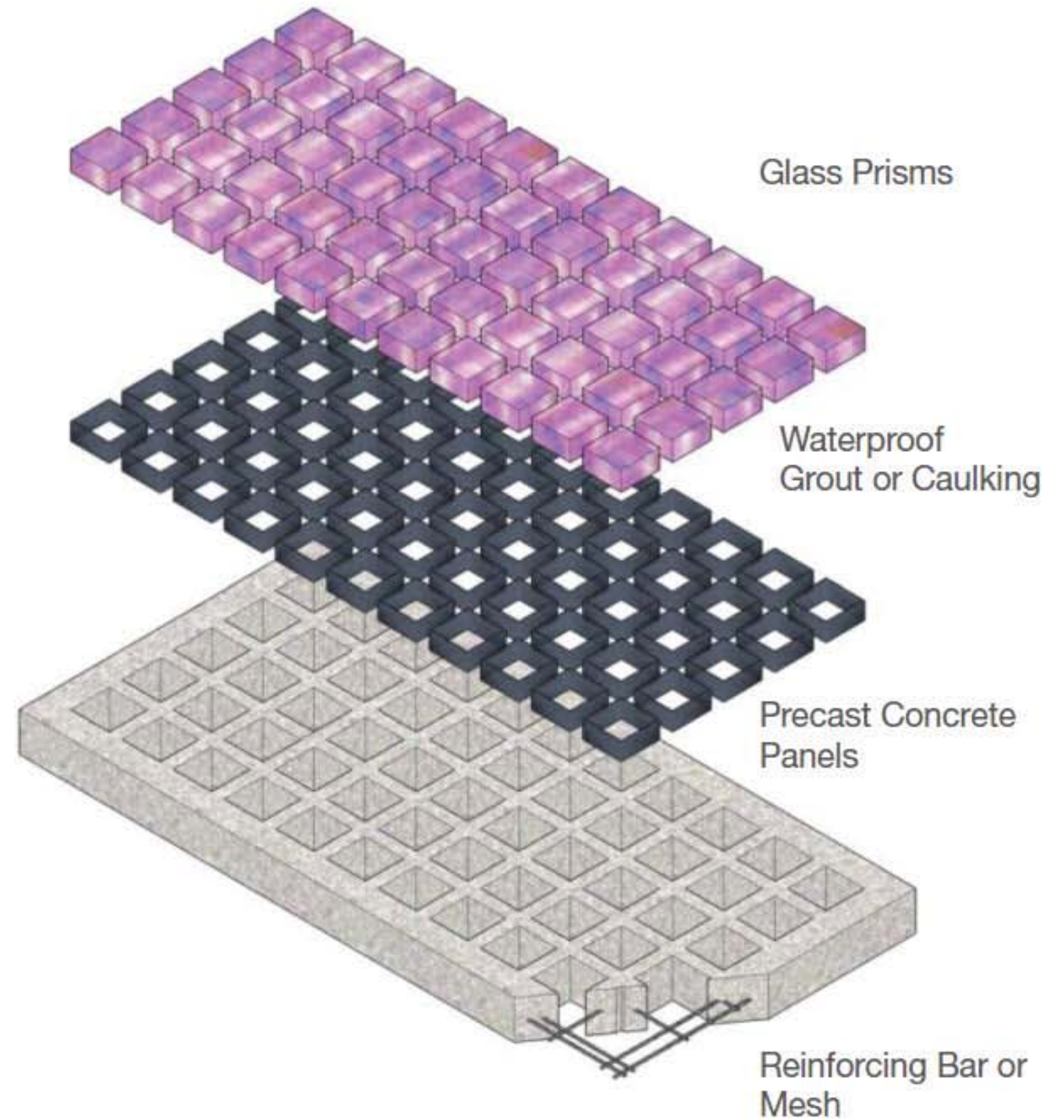
Section 3-way armored glass sidewalk lights showing waterproof intermediate joint

The 2011 Seattle University Seattle Prism Light Reconnaissance Study found the two diagrams above from the American 3 Way-Luxfer Prism Co. in 1927-28.

PRISM GLASS PANEL ASSEMBLY USING CAST IRON CONSTRUCTION



PRISM GLASS PANEL ASSEMBLY USING PRECAST CONCRETE PANELS



HOW DO I STEWARD THE PRISM GLASS PANELS

Whether you are a property owner, business owner, resident or visitor, a well-maintained, tidy built environment benefits everyone in Pioneer Square.

Prism glass panels require both on-going maintenance (e.g. replacing chipped glass, re-sealing joints, etc) and periodic major maintenance (e.g. reconstructing areaways, replacing entire panels, etc). In order to conduct this maintenance, property owners should budget for periodic improvements. Property owners and developers must also seek approval from the Pioneer Square Preservation Board and, depending on the size and scope of the project, SDOT.

The PSPB requires a Certificate of Approval (COA) for any work in the areaways, which are a protected cultural resource. SDOT requires a Street Improvement Permit (SIP) for panel replacement and areaway structural work. Regular maintenance does not require an SDOT permit, but some maintenance does require administrative review by PSPB staff.

Property owners are responsible for the condition of the sidewalk and prism glass

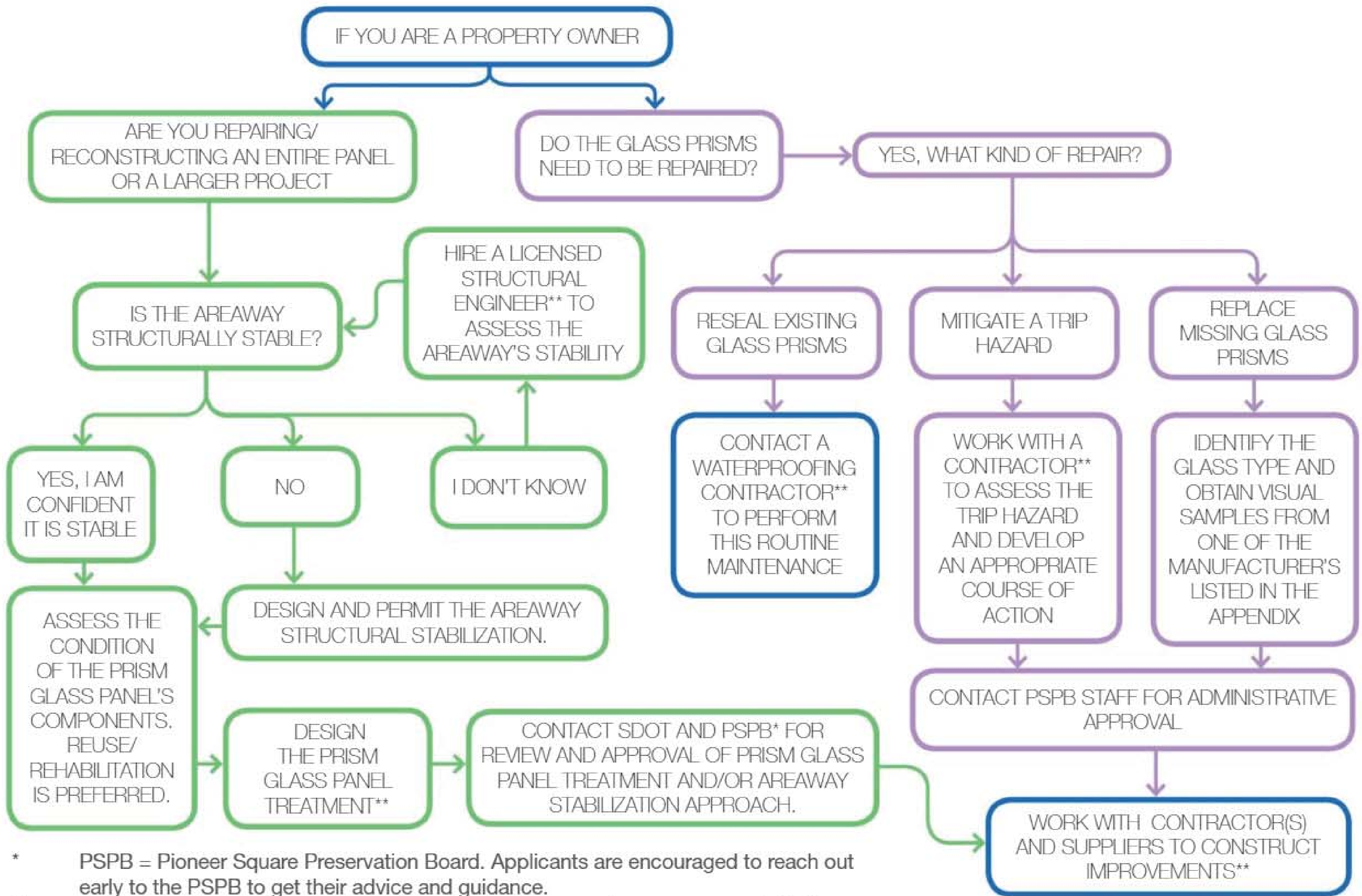
panels in front of their properties, including the structural integrity of the underlying areaway, street wall and subsurface building wall.

The flow chart on page 11 shows the two basic pathways to implement prism glass panel improvements: repair and replacement. This flow chart is not meant to be comprehensive nor describe every possible case, but is intended to describe a generalized sequence and approach to stewarding the prism glass resources. Each property's conditions are unique and consulting with qualified, licensed professionals will be important to understand each property's particular conditions.

For property owners conducting minor repairs, the permitting and construction process is relatively straightforward with an assessment, administrative PSBP review, and repair being all that is required.

Periodically, however, properties will need to conduct more significant maintenance and/or reconstruction activities. In these cases, property owners should first assess and, if needed, stabilize their existing areaway before turning their attention to the prism glass panels. Once the areaway is stable, property owners can develop a treatment strategy for the prism glass panels. Whichever treatment is

recommended, property owners should reach out early to seek advice from the PSPB and SDOT prior to submitting an application for the Certificate of Approval from the PSPB. In an emergency, contact PSPB staff for an emergency COA.



* PSPB = Pioneer Square Preservation Board. Applicants are encouraged to reach out early to the PSPB to get their advice and guidance.

** Examples of recently completed prism glass and areaway improvements, including consultants and contractors can be found in the appendix.

RESOURCE DOCUMENTS

AREAWAYS AND PRISM GLASS

Pioneer Historic District Areaways Hazard Mitigation Study, March 2003. Available from Ainalem Molla at SDOT. https://issuu.com/pioneersquareseattle/docs/pshd_areaways_study_2003

This SDOT produced document describes the structural stability and hazards for the various areaways throughout Pioneer Square, and suggests hazard mitigation prioritization for the areaway locations.

Seattle Prism Light Reconnaissance Study, Spring 2011. Available on the Alliance for Pioneer Square's website at: <http://allianceforpioneersquare.org/wp/wp-content/uploads/2011/12/Seattle-Prism-Light-Reconnaissance-Study.pdf>

Produced by students and faculty at Seattle University, this document provides extensive history, assessment, and inventory of the prism glass throughout the city, including Pioneer Square.

Repair and Rehabilitation of Historic Sidewalk Vault Glass Preservation Tech Notes, Historic Glass Number 2, National Park Service. <https://www.nps.gov/tps/how-to-preserve/tech-notes.htm>

The National Park Service (NPS) produced this technical guidance document for properties to help property owners comply with the requirements of the National Historic Preservation Act as it pertains to their stewardship of prism glass panels. Though national in focus, it is a robust technical discussion of these built resources

PERMITTING GUIDANCE

Pioneer Square Preservation Board Design Guidelines:

<https://www.seattle.gov/Documents/Departments/Neighborhoods/HistoricPreservation/HistoricDistricts/PioneerSquare/PioneerSquare-Guidelines.pdf>

Pioneer Square Preservation Board Application for Certificate of Approval:

<http://www.seattle.gov/Documents/Departments/Neighborhoods/HistoricPreservation/HistoricDistricts/PioneerSquare/PioneerSquare-Application.pdf>

SDOT Street Improvement Permit Guidance:

<http://www.seattle.gov/transportation/permits-and-services/permits/street-improvement-permits>

SDOT Right-of-Way Improvements Manual/ Streets Illustrated:

<http://streetsillustrated.seattle.gov/>

SDOT Construction Use Permit:

<https://www.seattle.gov/transportation/permits-and-services/permits/construction-use-in-the-right-of-way>

RESOURCES, CONTINUED

PRISM GLASS MANUFACTURERS

The following glass manufacturer's have been identified and/or used for recent installations of prism glass within the district. In most of the case studies here, the final assembly of the sidewalk panel has been constructed locally.

Circle Redmont

2760 Business Center Blvd.
Melbourne, FL 32940
(800) 358-3888
www.circleredmont.com

Circle Redmont has assembled the concrete and cast iron framework in the projects they have worked on.

Seattle Stained Glass

2510 N 45th St
Seattle, WA 98103
(206) 633-2040
www.seattlestainedglass.com

Seattle Stained Glass has the capability to create fused glass prisms by cutting and dividing a large panel of glass into the desired prism size. These individual pieces are then polished to smooth the edges and finished by sandblasting the exposed face.

Blenko Glass Company

9 Bill Blenko Dr
Milton, WV 25541
(304) 743-9081
www.blenko.com

Architectural Glass Incorporated

71 Maple Street
Beacon, NY 12508
(845) 733-4720
www.architecturalglassinc.com

CASE STUDY APPENDIX

The pages that follow offer several case studies of recent prism glass panel repair/replacement projects around the Pioneer Square Historic District.

We have identified the following projects:

- A. Smith Tower (506 2nd. Ave.)
- B. Pacific Commercial Building (240 2nd. Ave. South)
- C. Merrill Place (411 1st. Ave. South)
- D. Sinking Ship Garage (515 2nd. Ave.)

In addition, the manufacturer Circle Redmont provided example panel shop drawings.



CASE STUDY APPENDIX, CONTINUED

MERRILL PLACE

411 1st Ave. South

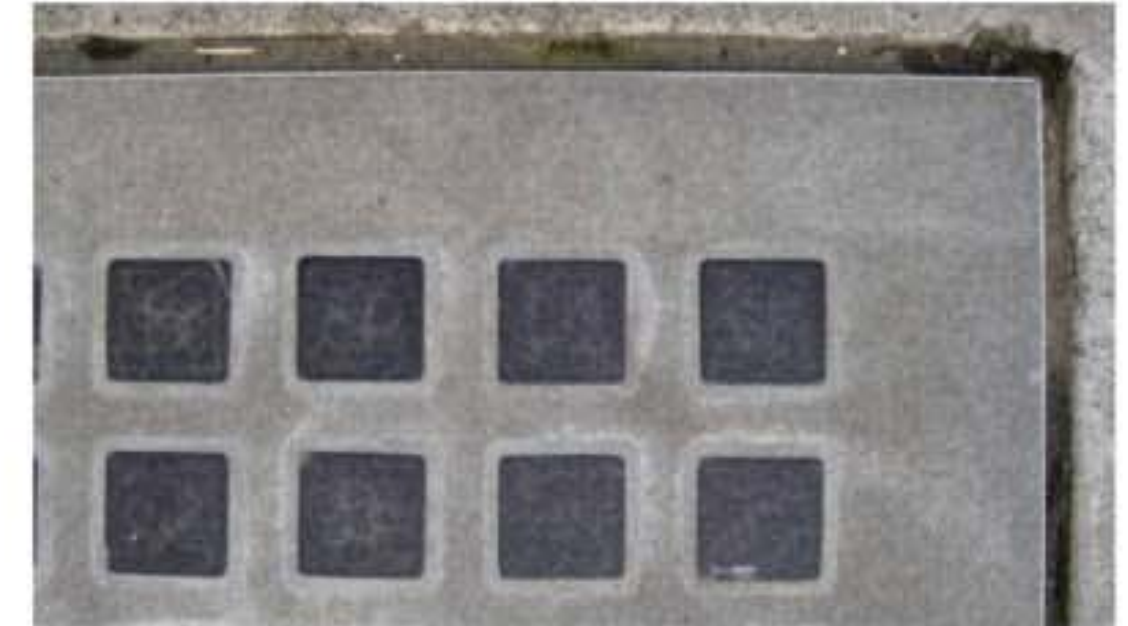
Within the 1st Ave. sidewalk, the developer Nitze-Stagen replaced 28 panels in groupings of four as part of a complete sidewalk reconstruction in 2012 along the entire facade. Each panel is 3'x 6'.

Architect: Ron Wright & Associates

Contractor: Lydig Construction

Fabrication: Circle Redmont Inc.

Owner/Developer: Nitze-Stagen



LESSONS LEARNED

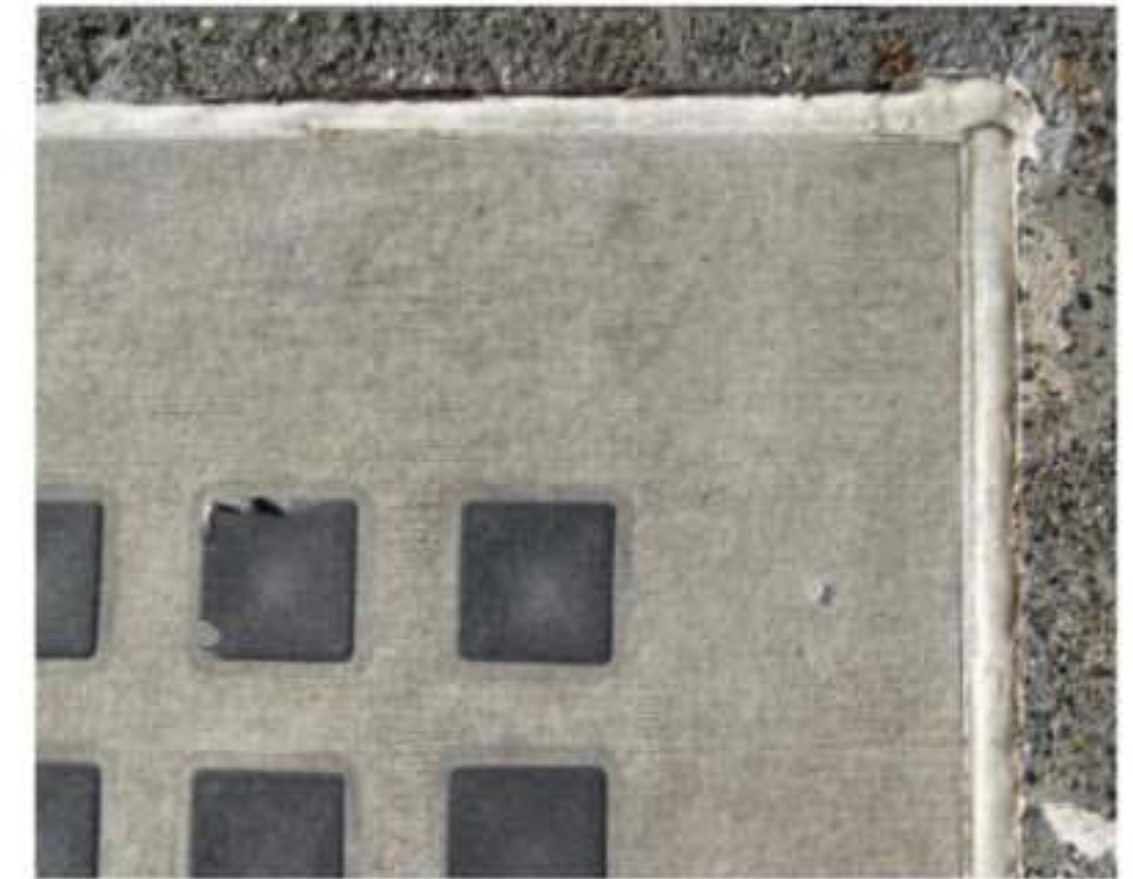
- Begin prism glass sourcing early. Replacement prism glass in the historic sizes may be hard to locate.
- To mimic the historically lit areaway, the team installed LED fixtures under the panels.

CASE STUDY APPENDIX, CONTINUED

PACIFIC COMMERCIAL BUILDING 240 2nd Ave. South at Main St.

Within the Main St. sidewalk, 2 panels were replaced in 2017. Each panel is 3'-6" x 6'-9".

Contractor: Adatto Construction
Engineer: Cascade Crest Consulting
Panel Fabrication: Circle Redmont Inc.
Steel Frame: Dimensional Design
Owner/Developer: Sam Largent



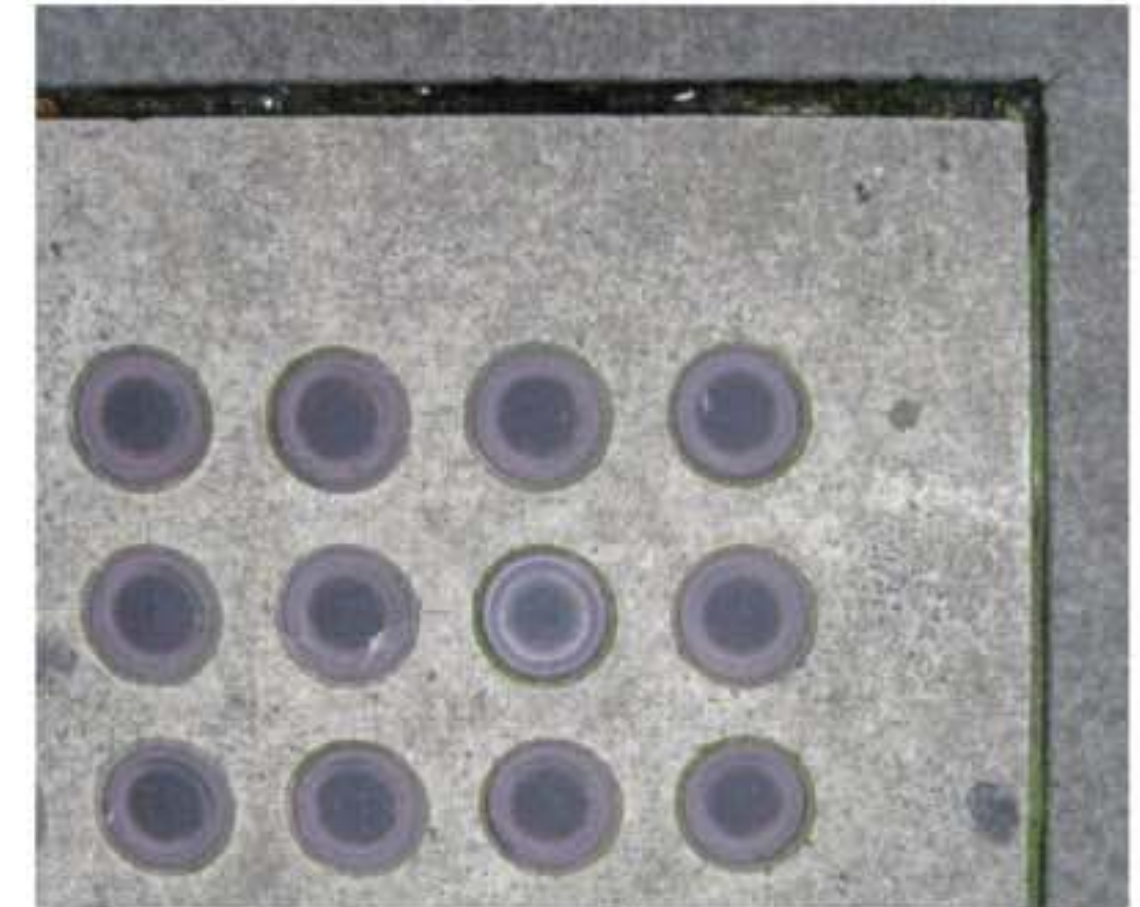
LESSONS LEARNED

- Begin the design and permitting process early to avoid project delays.

CASE STUDY APPENDIX, CONTINUED

SINKING SHIP PARKING GARAGE 515 2nd Ave.

Within Yesler Way and 2nd Ave. sidewalks, 16 panels in two different sizes were replaced in approximately 2001. Nine larger panels measure 3'x 6' and seven smaller panels measure 3'x 3'.



NOTES

- The original panels were damaged during the 2001 Nisqually earthquake.
- Key panels were restored, though many remain damaged.

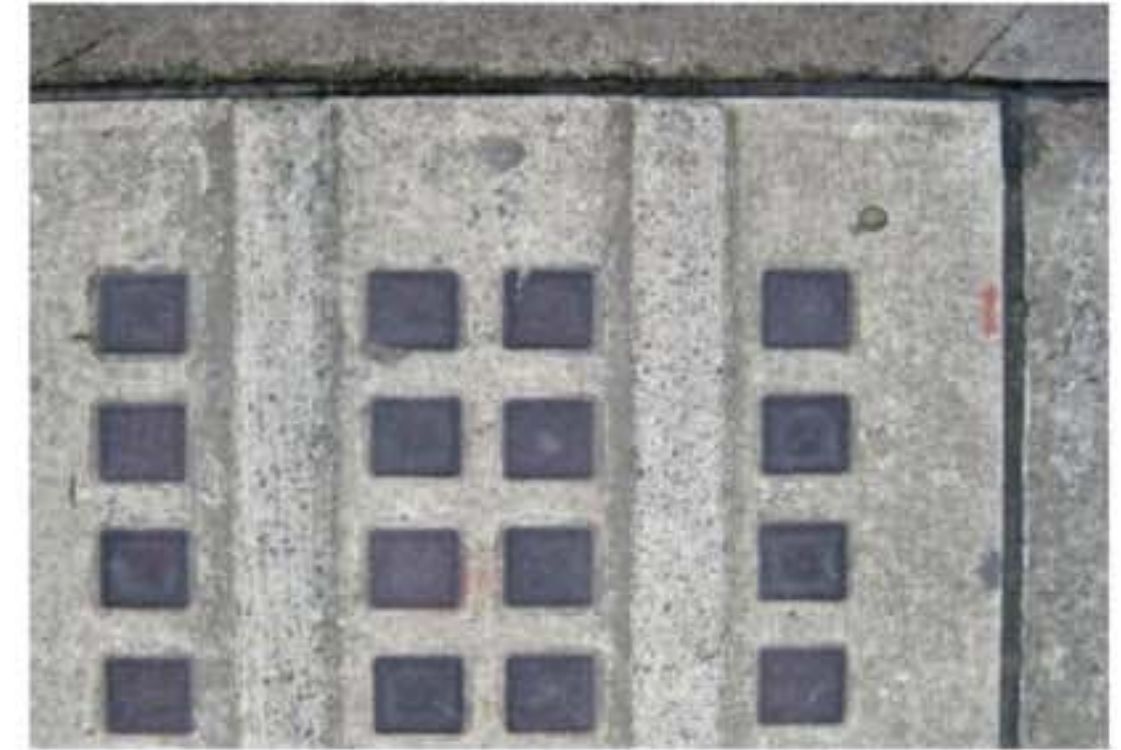
CASE STUDY APPENDIX, CONTINUED

SMITH TOWER

506 2nd. Ave.

Along the Yesler Way side of the property, sidewalk panels of various sizes were replaced in approximately 2008. Panels range from 5'-6" x 5' and 5'-6" x 8' x 4", and some have raised areas to provide traction for pedestrians moving up and down Yesler Way. Replacement of panels within the 2nd Ave. sidewalk are scheduled for summer 2018.

Architect: Evolution Architecture
Prism Glass and Panel
Fabrication|Manufacturer: Circle Redmont Inc.

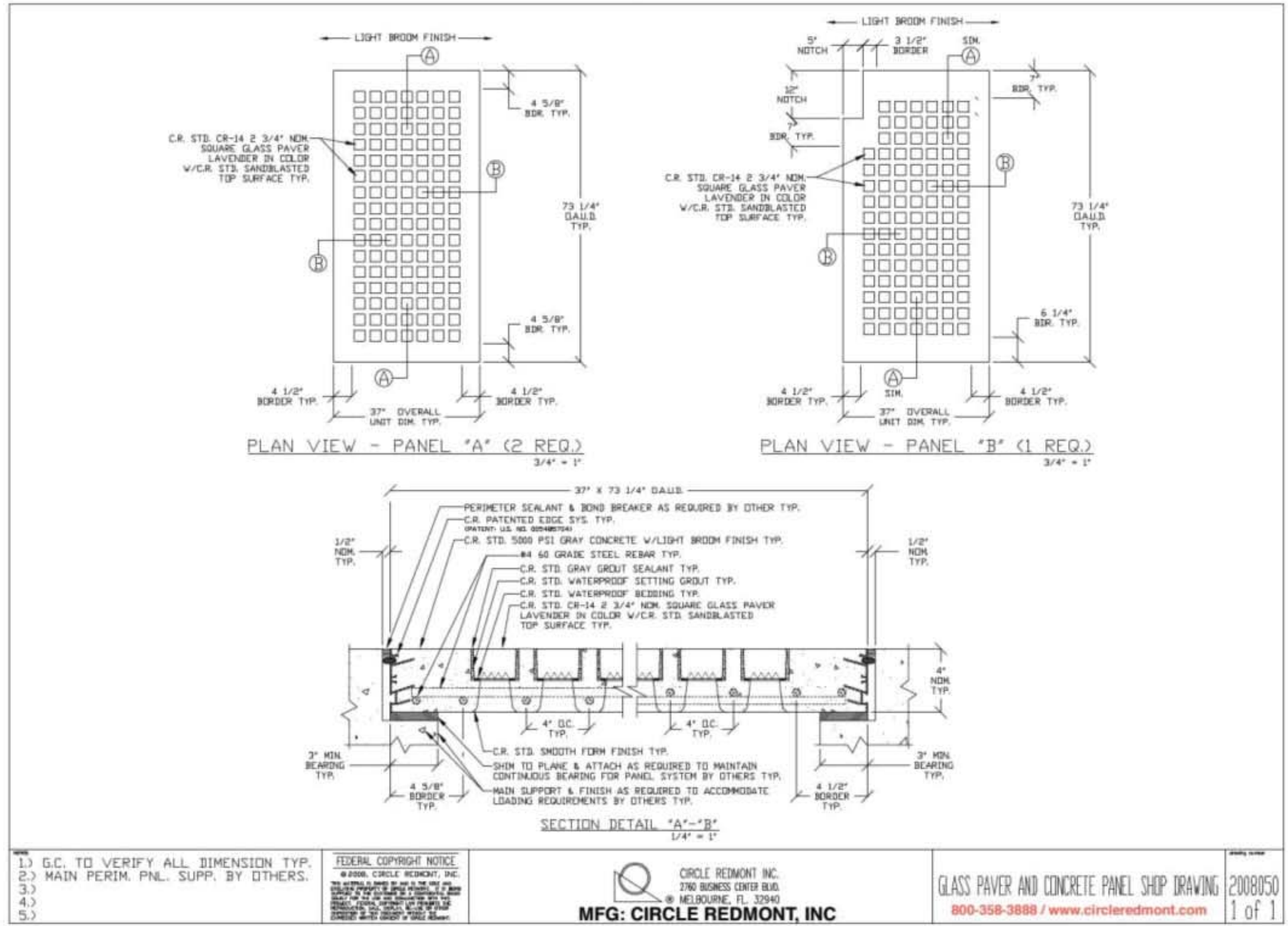


LESSONS LEARNED

- The prism glasses and panel assembly was done by the same supplier.

CASE STUDY APPENDIX, CONTINUED

This typical panel construction drawing shows the standard approach Circle Redmont used on Merrill Place and the Pacific Commercial Building. On the following page the typical cast iron panel construction is shown.



CASE STUDY APPENDIX, CONTINUED

