Photo Credit: Shae Rocco / Brookfield

Port Approval Date: February 27, 2019
Final Print Date: September 1, 2020

PIER 70 SUD

STREETSCAPE MASTER PLAN

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STREETSCAPE MASTER PLAN

CITY REVIEW STAFF

Port of San Francisco
San Francisco Public Works
San Francisco Public Utilities Commission
San Francisco Fire Department
San Francisco Planning Department
San Francisco Municipal Transportation Agency

PROJECT SPONSOR

Brookfield Properties

PROJECT TEAM

GLS | Landscape Architecture | Streetscape Design
BKF | Civil Engineering
SITELAB Urban Studio | Urban Design
James Corner Field Operations | Landscape Architecture | Open Space Design

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2 SITE-WIDE STRATEGIES & PALETTES

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DOCUMENT GUIDE

This document, the Pier 70 SUD Streetscape Master Plan (SSMP) provides the vision, intent, and guidelines for the future design of the streetscapes within the 35-acre Pier 70 SUD area (Project Site).

TERMS

The Project Site is bound by 20th Street to the north, 22nd Street to the south, Illinois Street to the west and the Bay to the east, as illustrated in Figure 1.1.1. The Project Site boundary is illustrated in Figure 1.4.1. Chapter 1 provides further description and context for site areas and the project. Commonly used terms and designations are defined as follows:

• "PLANNING CODE": all references refer to the San Francisco Planning Code as of the time of entitlements.

• "PIER 70 PROJECT SITE", "PROJECT SITE" or "SITE": refers to the area comprised of the 28-Acre Site and Illinois Parcels as shown on Figure 1.4.1.

• "D4D": refers to the Pier 70 SUD Design for Development document.

• "SPECIAL USE DISTRICT": refers to the Special Use District document to be adopted by the Board of Supervisors.

• "PIER 70 AREA": refers to the 69-acre Pier 70 boundary, which includes the Cove, BAE Ship Repair and Historic Core in addition to a portion of the Pier 70 Project Site.

• "HISTORIC CORE": refers to the Union Iron Works (UIW) Historic District being redeveloped by Orton Development, Inc. (ODI).

• "SSMP" or "PIER 70 SUD SSMP": refers to this document, the Pier 70 SUD Streetscape Master Plan.

• "PIER 70 SUD SSMP STUDY AREA": refers to the area studied in the SSMP which includes the Project Site and off-site roadways between Illinois Street and the Project Site as shown on Figure 1.4.1.

• "DEVELOPER": refers to Brookfield Properties (formerly Forest City Realty Trust) and its affiliates.

RELATED DOCUMENTS

This SSMP document builds upon the Pier 70 SUD D4D document and provides a greater level of design and technical detail.

The Pier 70 SUD SSMP is supported by the following related documents, which provide planning context for various aspects of the Pier 70 Project:

- Pier 70 SUD Sustainability Plan
- Pier 70 SUD Transportation Plan
- Master Utility Plans
- Development Agreement
- Infrastructure Master Plan
- Roadway and Utility Sections
- Interagency Cooperation Agreement

APPENDICES

Appendix A contains the "Approval of Streetscape Master Plan for the Pier 70 Special Use District" letter which includes additional conditions of approval for implementation of the SSMP.

Appendix B refers to "Pier 70 SUD Vehicular Turning Supplement" as part of the Pier 70 SUD Streetscape Master Plan for approval.

The Pier 70 SUD Vehicular Turning Supplement includes:

Attachment A: SU-30 Turning Compound Radii Corner Studies

Attachment B: SFFD FE-34 Turning Studies

Attachment C: SFFD 57' Ladder Truck Turning Studies

Attachment D: Bus Turning Studies

Attachment E: Commercial Shuttle Turning Studies

Attachment F: WB-50 Turning Studies

Pier 70
Historic Aerial Image

Photo Credit: Shae Rocco / Brookfield

EXECUTIVE SUMMARY

PREFACE

This document — the Pier 70 SUD Streetscape Master Plan (SSMP) — advances the Pier 70 SUD Design for Development (D4D) document and contains more specific design standards and guidelines that will guide the implementation of streetscapes in the Pier 70 Project Site. It also provides a cohesive vision, describing the intent and goals of the overall streetscape network. Building upon the D4D, existing assets in the immediate vicinity and surrounding neighborhoods, as well as the San Francisco Bay Area as a whole, the Streetscape Master Plan furthers the creation of a cohesive identity and place-making within the Project Site. By establishing a conceptual design for all aspects of the streetscape - including street trees, planting, paving, lighting, furnishings, parking, loading zones, and utilities coordination - the plan situates the streetscape as a key component of a vibrant and high-functioning landscape and public realm.

REGULATORY CONTEXT & AUTHORITY

The standards and guidelines set forth in the Special Use District document and the D4D represent the culmination of over seven years of public discussion on how this unique land asset in San Francisco should best contribute to the City's future. The vision it advances is to create a new neighborhood that is an authentic extension of the neighboring Dogpatch, is compatible with the Union Iron Works Historic District (Historic District), and provides new access and amenities along the San Francisco Bay shoreline.

The D4D has been adopted by the Planning Commission and Port Commission. The Special Use District, which incorporates the D4D by reference, has been adopted by the Board of Supervisors after recommendation by the Planning Commission. The SSMP is submitted as final for approval.

The Port of San Francisco is the public agency responsible for the oversight of the development within the Pier 70 Project Site. The Port of San Francisco and Planning Department and Commission, as applicable, will review and approve the development of buildings in the Pier 70 Project Site in accordance with the standards and procedures set forth in the Special Use District and the D4D. As such, the standards and guidelines set forth in the Special Use District and the D4D will guide all future development within the Pier 70 Project Site, including both the public and private realms, in a way that fulfills the vision set forth in the D4D.

Appendix A contains the Approval of Streetscape Master Plan for the Pier 70 Special Use District" letter which includes additional conditions of approval for implementation of the SSMP.

Pier 70
View from Building 2 with the Bay Beyond

Photo Credit: Shae Rocco / Brookfield

1 INTRODUCTION

A hub of industry and craftsmanship supporting the economy of San Francisco in the 1900's, Pier 70 today is semi-abandoned, but quickly being reinvigorated to support the needs of adjacent neighborhoods and the greater city as a whole. Renovated historic resources - enlivened by new architecture - will bring housing, services and recreation to a restored waterfront and outdoor space network. The armature for this reimagined district is this Streetscape Master Plan document, which will guide the transformation of existing streets - built to serve the particularities of industry at a specific moment in time - into a state of the art street system, re-conceptualized to perform the multiple functions required to support residents, visitors, workers, transit and trees for the next 100 years.

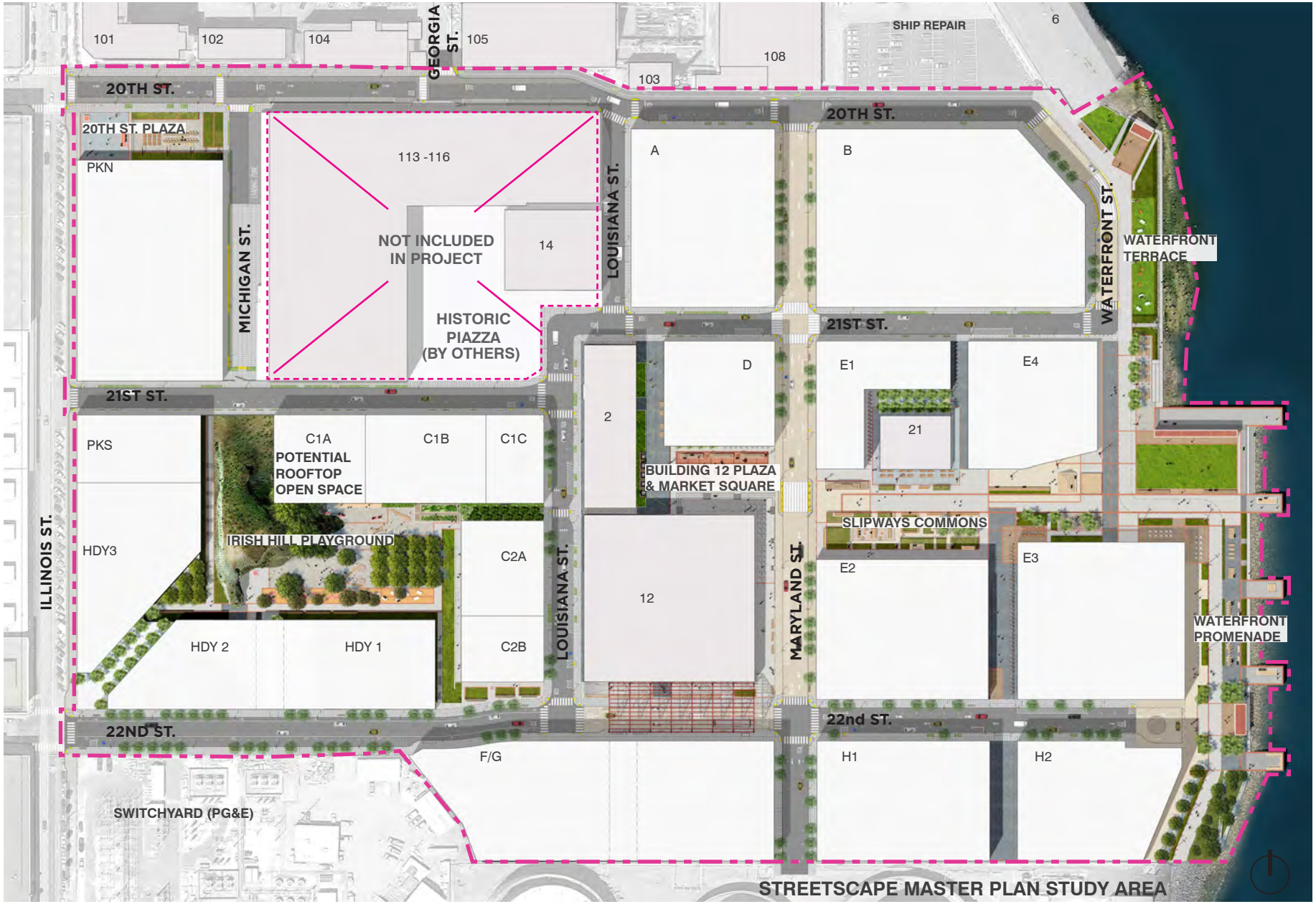


FIGURE 1.1.1: Project Site Streetscape Master Plan

1.1 BACKGROUND

1.1.1 BRIEF HISTORY OF SITE

The Project Site is currently in the process of shifting from a primarily industrial site to one of mixed uses and contemporary programs reflecting the needs of a city in transition and changing demographics. The vast majority of the Site falls within a portion of the larger 66-acre Union Iron Works (UIW) Historic District, listed on the National Register of Historic Places in 2014. The UIW Historic District consists of buildings, piers, slips, cranes, ship repair activities, and landscape and circulation elements that are associated with steel shipbuilding. The preservation and enhancement of these historic resources provide some of the main drivers behind the design decisions presented in this Pier 70 SUD SSMP document.

Historic Photo

1.1.2 PLANNING CONTEXT & PROCESS

EASTERN NEIGHBORHOODS PROGRAM

The Pier 70 SUD is located in the northeastern sector of the Central Waterfront Area Plan, which is one of the four plan areas included in the Eastern Neighborhoods Program. The Eastern Neighborhoods Program, adopted in 2009, addresses neighborhoods that historically contained the majority of the City's industrially-zoned land.

The Pier 70 SUD design aligns directly with the key goals of the Eastern Neighborhoods Program and the Central Waterfront Plan by encouraging mixed use development consistent with the working neighborhood character, supporting increased housing while respecting production areas, advocating for multi-modal transit, promoting access to the waterfront, and calling for improvements to the public realm.

PIER 70 PREFERRED MASTER PLAN

In 2007, the Port of San Francisco commenced a master planning and community outreach process for the Pier 70 Area. The planning and community outreach process culminated in 2010 with the endorsement of the Pier 70 Preferred Master Plan. This plan anticipated the need for the Port to select a qualified master developer to partner on redevelopment of the waterfront site and outlined major goals, including the following:

- return Site to historic activity levels
- promote pedestrian-oriented development and foster alternative, sustainable transportation modes and practices
- extend the Bay Trail / Blue Greenway through the site and along the shoreline
- rehabilitate and accommodate historic resources in the area, including the preservation of historic buildings and the long-term viability of the ship repair industry
- extend the city street grid to integrate new development with existing urban fabric and to enhance public access to the waterfront

PIER 70 SPECIAL USE DISTRICT

Building on the direction of the Preferred Master Plan, the Port issued a Request for Qualifications for a development partner for those identified infill opportunities within the Pier 70 Area and ultimately selected Brookfield (formerly Forest City).

From 2011 through today, the vision for the Pier 70 Project has grown directly from the goals outlined in the Preferred Master Plan, conversations with the Dogpatch and Potrero Hill communities and stakeholders citywide, as well as important input and feedback from City agencies, including the Port Commission. Starting in 2013, Brookfield initiated temporary events and activities to test design ideas and to allow the community to visit and experience the site. Between 2011 and 2017, over 100,000 visitors attended over 50 events, allowing community members the opportunity to experience Pier 70 for the first time.

This nearly 10-year sequence of outreach and participation—from the Preferred Master Plan, to special events and temporary activation of the site, as well as close collaboration with City agencies—led to the standards and guidelines outlined in D4D.

The Pier 70 Special Use District document sets forth the requirements for future development at the site. The D4D is incorporated by reference into the Pier 70 Special Use District document and sets forth design standards and guidelines for vertical and horizontal improvements at the site. This SSMP is informed by the Special Use District and D4D documents and establishes a greater level of design detail and engineering for streetscape improvements within the Pier 70 Project area.

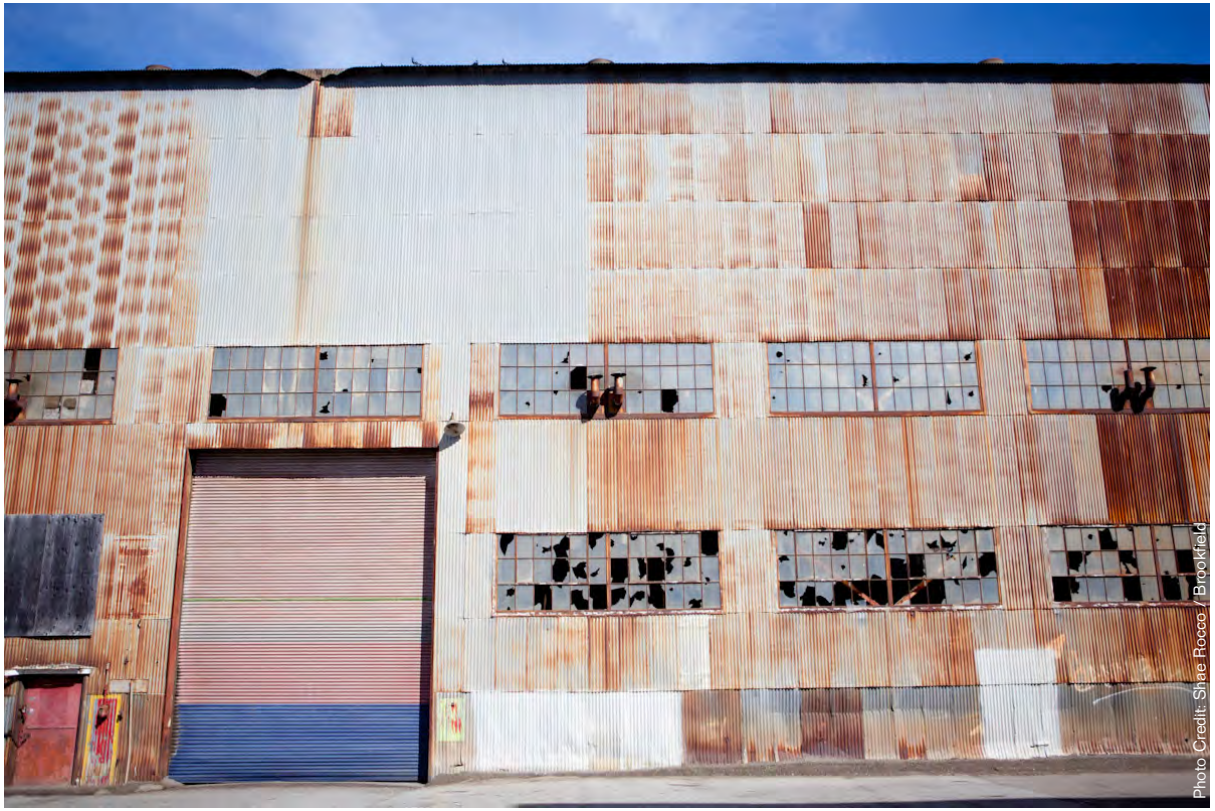
PIER 70 SUD SSMP

On 9/6/16 the Brookfield design team met at San Francisco Public Utilities Commission with over 20 people representing the following agencies, to summarize the D4D and collect feedback in order to commence work on the SSMP: San Francisco Public Works (SFPW), San Francisco Fire Department (SFFD), San Francisco Public Utilities Commission (SFPUC), San Francisco Planning Department (Planning), the Port of San Francisco (Port), and the San Francisco Municipal Transportation Agency (SFMTA).

1.2 PURPOSE OF DOCUMENT

The purpose of the SSMP is to establish the designs of new streets throughout the Pier 70 Project, building upon the D4D and Infrastructure Plan. The SSMP maintains the D4D vision by establishing streetscape design goals and implementation standards shared by the City, the Port of San Francisco and Brookfield. These include the following:

- resolve D4D design concepts with City Agency standards
- maintain historic character of neighborhood while rejuvenating activity levels
- prioritize bicyclists and pedestrian travel modes
- maintain service to new and old businesses
- preserve industrial activity while allowing recreational and neighborhood facilities
- establish streets as framework for future development



Existing Building 12

1.3 PLAN AREA DESCRIPTION

The Pier 70 Preferred Master Plan identified five sub-districts within the Pier 70 Area to support diversity, historic continuity, and creativity at the site. The Pier 70 Project Site is comprised of the 28-Acre Site and Illinois Parcels.

The site boundaries for the Pier 70 Project are as follows: from the face of curb on the east side of Illinois Street (or east of the Illinois Street right-of-way limit), east to the water; and from the back of sidewalk on the north side of 20th Street, south to the face of curb on the north side of 22nd Street, including the area north of the former power plant.

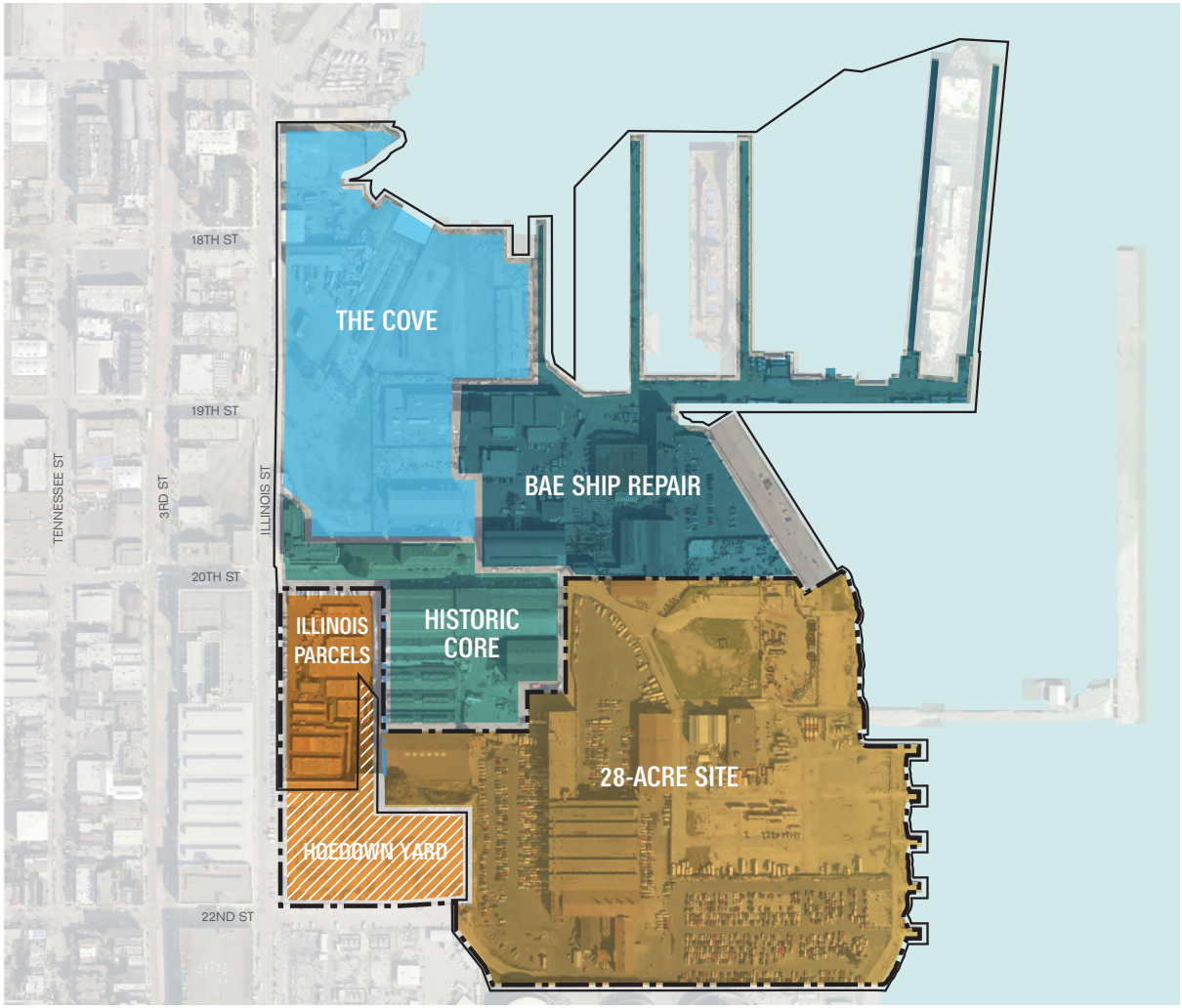


FIGURE 1.3.1: Port Pier 70 Sub-Districts

1.4 SITE OWNERSHIP

The streets are a unifying element across the site that cross through different ownership areas. The Pier 70 Project Site consists of the 28-acre site and the Illinois Parcels as shown in Fig.1.4.1 (Project Site). The majority of the Project Site is located within the Pier 70 Area, owned by the Port of San Francisco. The remainder of the site (the Hoedown Yard) is owned by Pacific Gas & Electric (PG&E). Portions of 22nd Street and Michigan Street within the SSMP study area are owned by the City and County of San Francisco under the jurisdiction of SFPW. The City has a transferable option to acquire the Hoedown Yard if PG&E can find a new location for this heavy industrial use. The street design responds to different site conditions within these areas as needed to maintain diversity, historic continuity and creativity across the site.

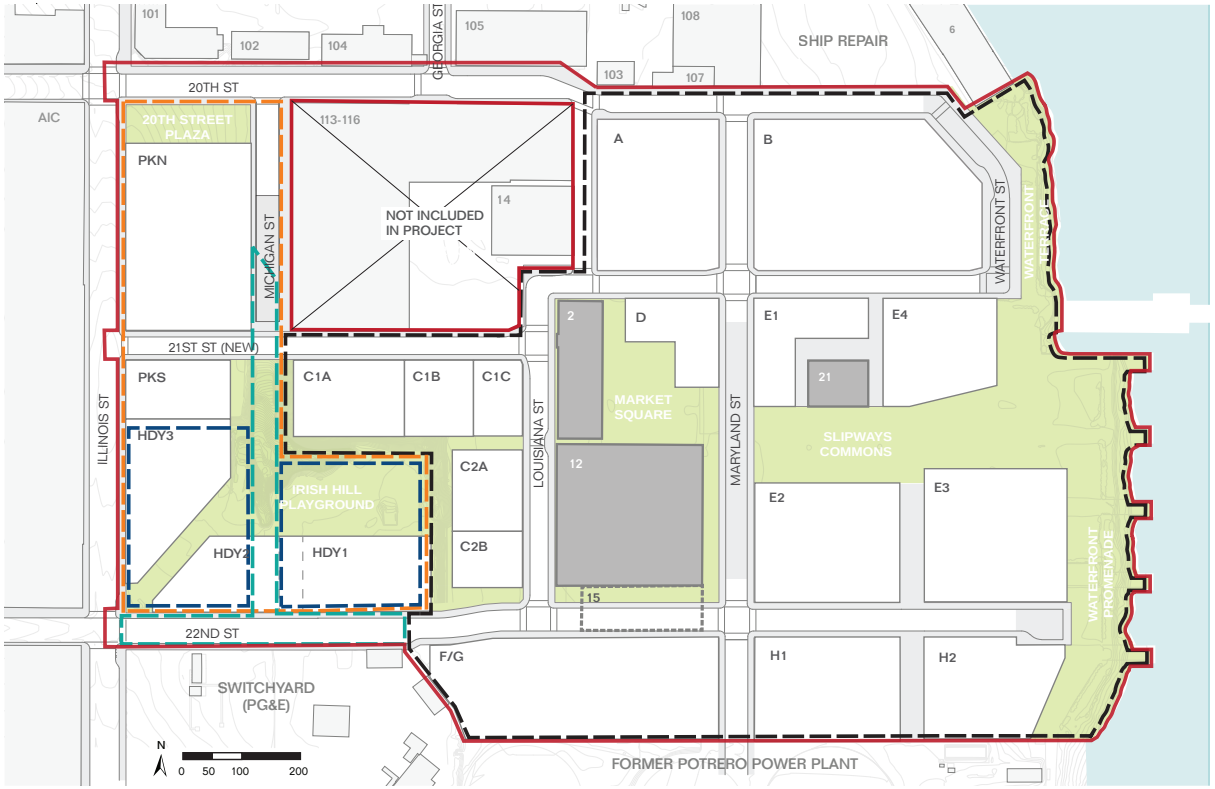


FIGURE 1.4.1: Pier 70 Project: Development Areas & Open Spaces

1.5 COMMUNITY DESIGN PROCESS, DESIGN PRINCIPLES & DESIGN GOALS

OBSERVATIONS & NEIGHBORHOOD THEMES

The community outreach process revealed a series of themes and observations most critical to the users and neighbors of the Pier 70 Project, which guided the development of a series of "principles of place" that evolved through the design process into a series of design principles.

DESIGN PRINCIPLES

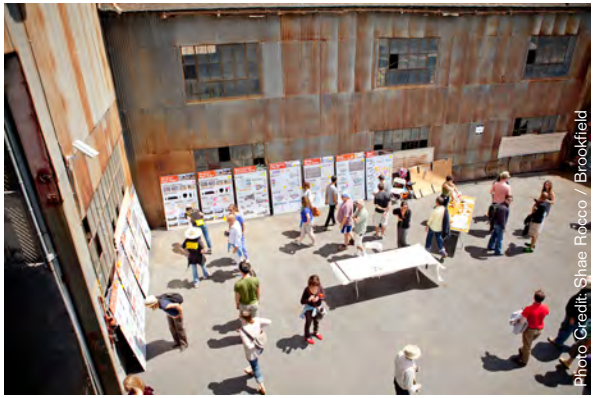
The design principles have driven the development of the Pier 70 Project SSMP, ensuring that streetscape designs are rooted in the neighborhood and cater to the specific themes outlined by local stakeholders. The four key design principles as they relate to the SSMP are as follows:

- **Celebrate Industry & History:** A key principle is to honor the history of industry, labor, and craft of this historic port, while simultaneously reinvigorating the site. As the Pier 70 Project restores activity to the site and provides opportunities for ongoing craft and light manufacturing, the SSMP ensures that the streetscapes respond to the material qualities of the industrial history, as well as the functional needs of current day industry.
- **Extend the Dogpatch Community:** Dogpatch is characterized by its diverse group of residents, workers and visitors, including an established arts and fabrication community. The Pier 70 Project SSMP extends the urban fabric of Dogpatch, bringing industry and community together to create a truly mixed-use and vibrant neighborhood.
- **Create a Network of Public Spaces:** The proposed streets connect open spaces within the site to create a cohesive open space network, extending the pedestrian and bike network from Dogpatch to the waterfront. The network of public open spaces reflects the historic layout of the site - with narrow alleys and linked in-between spaces that once supported the ship repair functions of the adjacent buildings. The texture and design of the new streetscapes relate to existing and new buildings and their uses with the site's past, while prioritizing pedestrian experiences and maintaining engagement through materiality and small details.
- **Open the Waterfront to the Public:** The street layout is strategically designed to provide a direct connection between the site's new and historic buildings, as well as the adjacent Dogpatch neighborhood, to the waterfront. The alignment of the site's east-west streets creates view corridors to the Bay and provides a framework for connecting the Bay Trail to the waterfront.

DESIGN GOALS

Building upon the over-arching Pier 70 Project design principles, the design goals for the SSMP are as follows:

- Advance the standards and guidelines articulated in the Pier 70 SUD D4D
- Further develop and refine the objectives for the streetscape network
- Ensure recommendations are consistent with the City's current codes and standards, as well as with urban design best practices
- Express the unique qualities and character of the Site as well as the adjacent Dogpatch by paying special attention to the anomalies to the standards, with the goal of achieving a textured and variable neighborhood quality
- Allow for design flexibility and the ability to adapt over time by providing options in the material, planting and furnishing palettes, as well as suggested guidelines for certain elements in the streetscape layouts



URBAN AIR Market

1.6 KEY SITE CONDITIONS

The Project Site today is characterized by a variety of physical factors, including its historic and natural resources, environmental factors, as well as its current uses - including warehouses, automobile storage lots, artists' studios and temporary event venues.

HISTORIC RESOURCES

The historic elements within the Site are some of the most important features driving the streetscape design and layout. These elements consist of buildings, piers, slips, cranes, ship repair activities, and landscape and circulation elements that are associated with steel shipbuilding. Maintaining historic buildings and other historic resources necessitate adapting San Francisco street alignments and design standards in order to preserve, complement and accentuate these historic features.

VIEWS

The layout of east-west streets within the Project Site are designed to maximize extended view corridors to the Bay. The street network is also designed to provide seamless connections to open spaces leading to and running along the waterfront.

BLUE-GREENWAY / BAY TRAIL

The Blue Greenway is the City of San Francisco's project to improve the City's southerly portion of the 500-mile, 9-county, region-wide Bay Trail, as well as the newly established Bay Area Water Trail and associated waterfront open space system. The Blue Greenway will expand recreational and water-oriented activities and green corridors to surrounding neighborhoods, including public open spaces proposed for the Pier 70 Project.

TOPOGRAPHY

One of the key topographic features in the Project Site is the remnant of Irish Hill, which stands 35 feet higher than the adjacent ground plane. The remnant of Irish Hill is a major site feature driving street layout. In general, the site slopes downward from Illinois Street toward the shoreline, with the steeper grades in the western portion of the site and approximately 30-feet of elevation change across the site. Roadway grading is designed to maximize accessibility and site drainage, while preserving the integrity of historic resources.

SOILS

A significant portion of the Project Site site is east of the historic shoreline and contains fill soils, originally placed to extend the area's buildable land. Due to the highly compacted, variable quality and largely inorganic nature of fill soils, more fertile horticultural soils will need to be introduced in tree wells and planting zones in this area in order to provide a more optimal growing environment. Continuous trenches of growing medium, such as structural soil, approximately 3 feet deep, shall be provided for street trees. Efforts will also be made to preserve and remediate native soils and the native plant communities they support wherever possible.

SITE ADJACENCIES

While the nature of the future development to the south of the Pier 70 Project is currently unknown, the SSMP expects that Maryland Street and the Bay Trail will continue to the south and connect with this development.

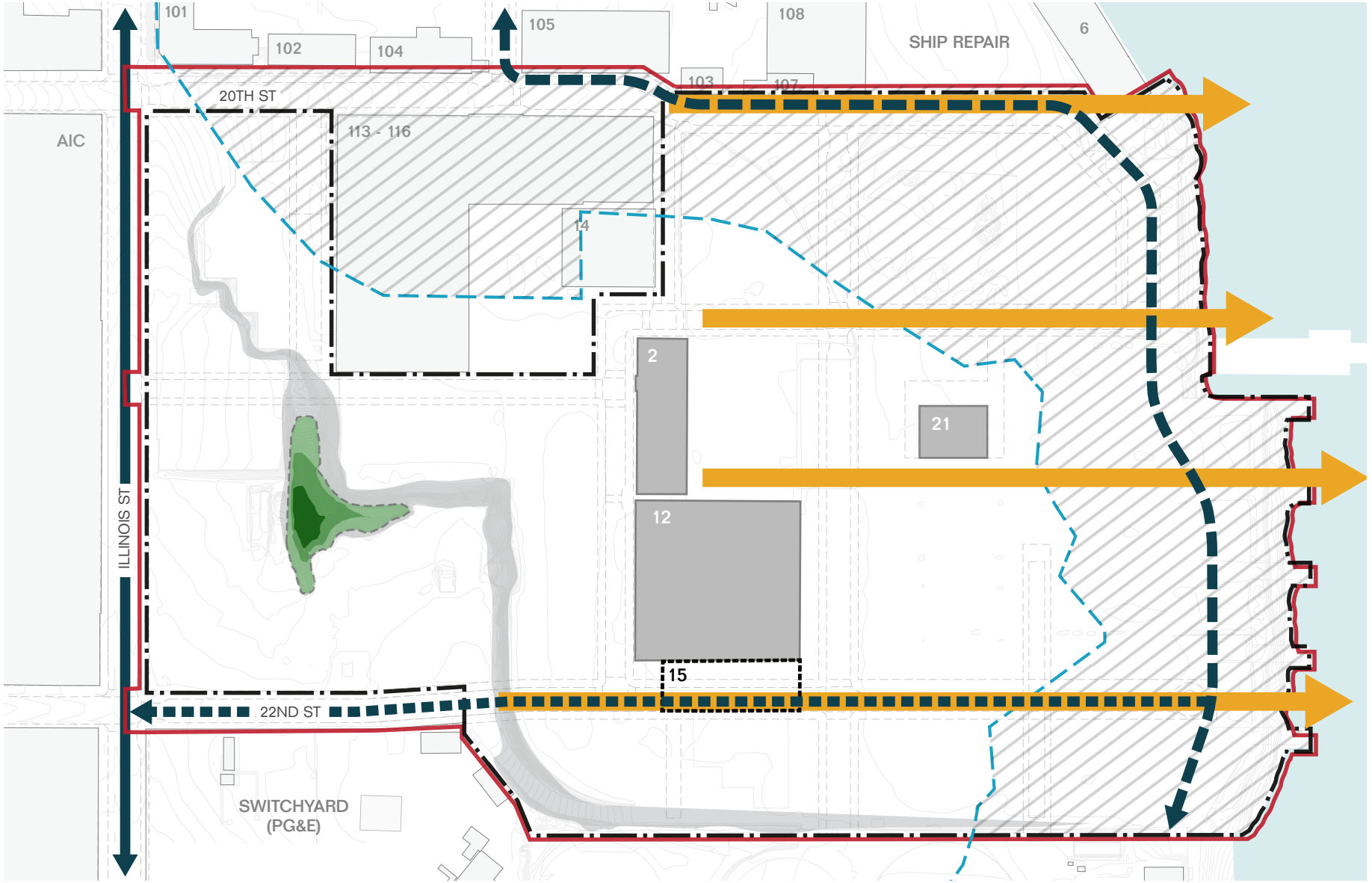


FIGURE 1.6.1: Site Conditions

Pier 70
Urban Air Market

Photo Credit: Shae Rocco/ Brookfield

2 SITE-WIDE STRATEGIES

Starting from the adjacent Dogpatch neighborhood, the grid of San Francisco will be extended east to the newly renovated waterfront. North-south streets will be extended to connect north to Crane Cove Park and south to future development of the former Potrero Plant. Compared to new San Francisco neighborhoods, the grid will be inflected at places to accommodate the historic buildings and the Irish Hill landform. To that end, the streets will be less formal and more finely grained than typical, in order to respond to the scale and character of immediate context and function. This diverse streetscape will be especially welcoming to pedestrians and bicyclists while providing efficient movement for vehicles, and accommodation of utilities and city services.

2.1 STREETSCAPE HIERARCHY & CHARACTER

2.1.1 STREETSCAPE HIERARCHY & CHARACTER

Each street design reflects a specific character depending on its function, adjacent land uses, and its proximity to the Historic Core, as illustrated in Figure 2.1.1.

Project streets are generally designed for passenger vehicles and vehicles up to 30 feet in length (SU-30) to serve neighborhood commercial and residential streets. For accommodations of larger vehicles refer to Section 2.6 to 2.8.

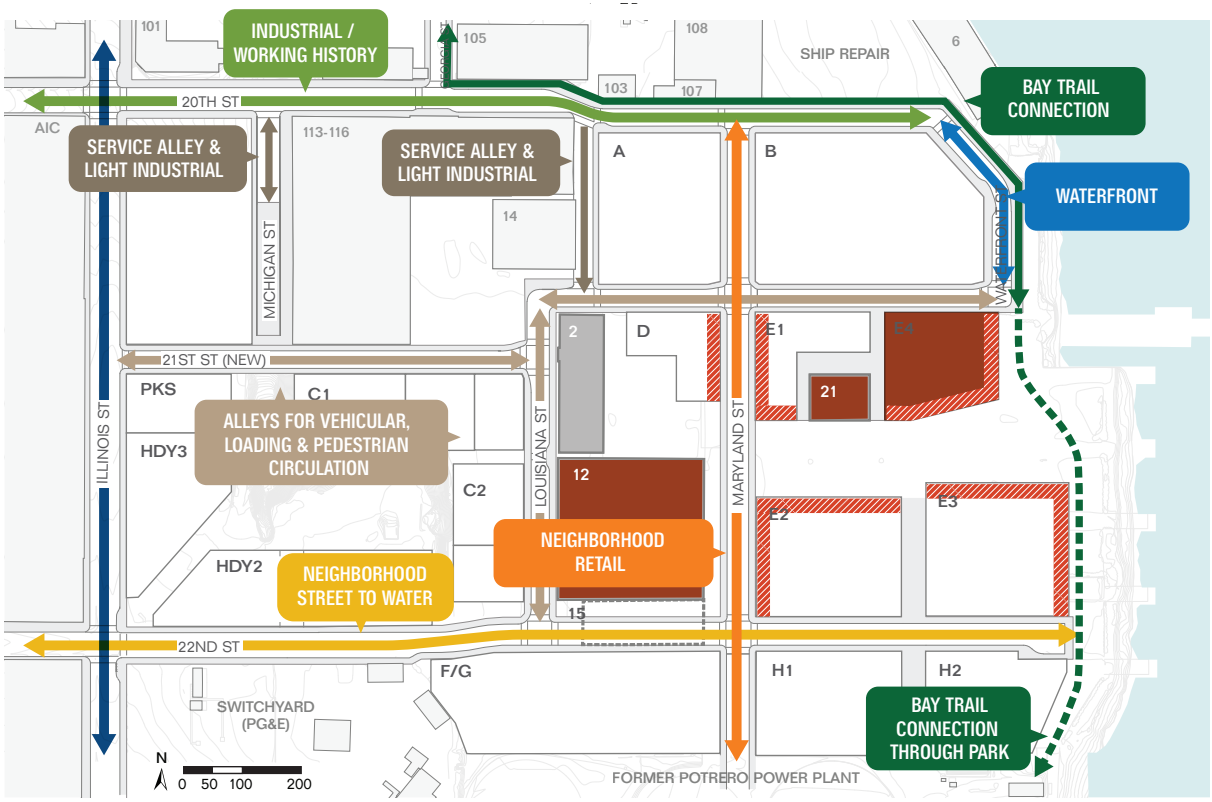


FIGURE 2.1.1: Street Character

Building with Retail, Arts and Industrial Use
Priority Retail Frontage

2.1.2 STREET WIDTH DIMENSIONS

The public right-of-way (ROW) is the space on a public street bounded by property lines on opposite sides of the street that will be dedicated to the City for acceptance. The ROW accommodates a comprehensive set of mobility, infrastructure, and streetscape elements, including facilities for pedestrians and bicyclists, persons with disabilities, vehicular access (cars, trucks, shuttles, and transit), utilities, furnishings, plantings, and storefronts. The intent of the Project street network is to balance these objectives while maintaining compatibility with the historic character.

In addition to the public ROW to be dedicated to the City, two of the street segments will be retained as Port streets. This includes Michigan Street and Louisiana Street North (between 20th Street and 21st Street).

As illustrated in Figure 2.1.2, street width varies in width depending on use and demand of adjacent parcels and open spaces. All streets in the Project are designed with a focus on traffic calming and strategically laid out to avoid through-streets. Thus, the streets are generally designed at the minimum width needed to reduce speeds and support pedestrian and bicycle safety.

Site-wide minimum widths are set for parking lane at eight feet, travel lane at ten feet, travel lane next to curb at 11 feet, travel lane with anticipated MUNI bus route at 11 feet, 12-foot travel lanes on 20th street at the waterfront, a one-way 20-foot travel lane at Louisiana North, and dedicated bike lane at six feet.

For ROW width and detailed street dimensions, see Table 2.1.1.

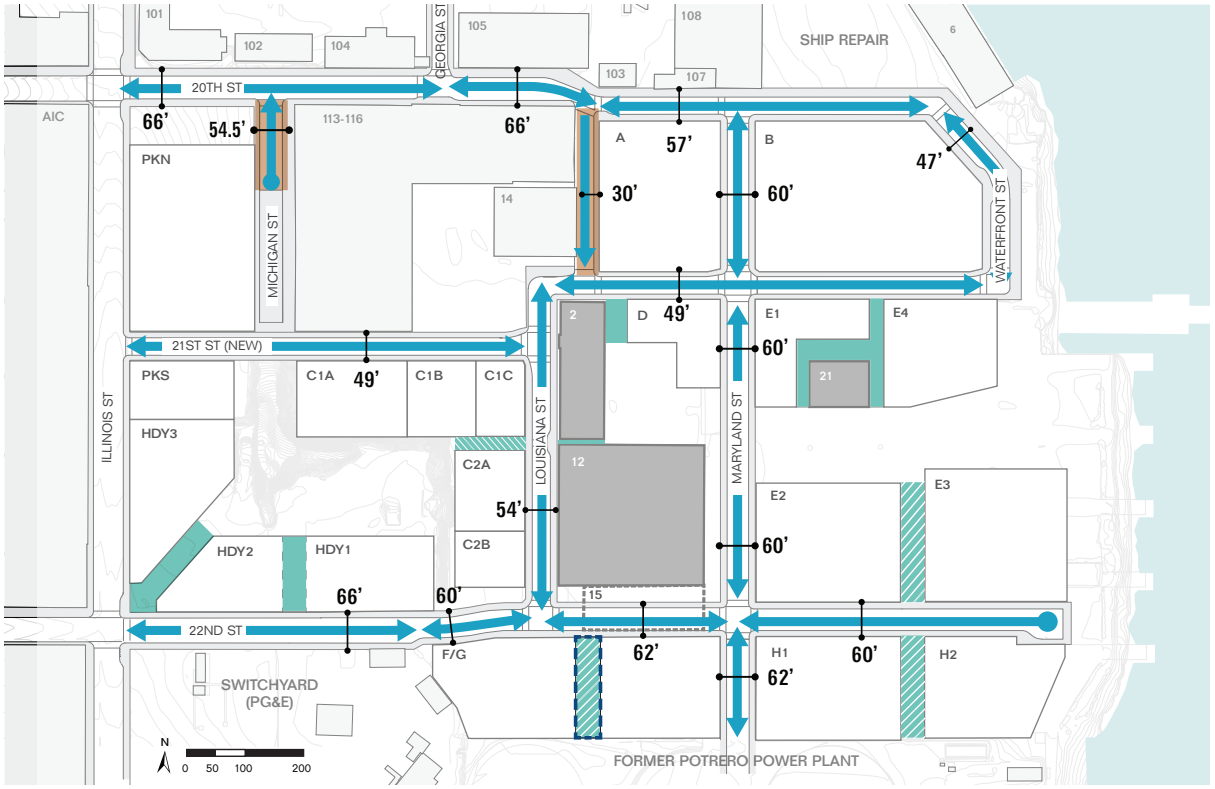


FIGURE 2.1.2: Street Width Dimensions

TABLE 2.1.1: Street Configuration Details

STREET	WIDTH	STREET ELEMENTS
20th Street West 1 (Illinois Street to Georgia Street)	66'	14'SW[1]/ 8'P/ 11'S/ 11'S/ 8'P/14'SW[4]
20th Street West 2 (Georgia Street to Louisiana Street)	66'	16'-8"BT[2]/ 8'P/ 11'/ 11'/ 8'P/ 11'-4" SW[4]
20th Street East (Louisiana Street to the Waterfront)	57'	16'BT/ 11'/ 10'/ 8'P/ 12'SW
Waterfront Street	47'	15'SW/ 8'P/ 12'/ 12'
21st Street West (Illinois Street to Louisiana Street)	49'	10'SW/ 11'/ 10'/ 8'P/ 10'SW
21st Street East (Louisiana Street to the Waterfront)	49'	10'SW/ 11'/ 10'/ 8'P/ 10'SW
22nd Street West (Illinois Street to SUD Boundary)	66'	12'SW/ 5.5'B/ 11'/ 11'S/ 5.5'B/ 9'P/ 12'SW
22nd Street Center 1 (SUD Boundary to Louisiana Street)	60'	12'SW/ 7'B/ 11'/ 11'S/ 7'B/ 12'SW
22nd Street Center 2 (Louisiana Street to Maryland Street)	62'	12'SW/8'P/11'TL/13.5'TL/17.5'SW
22nd Street East (Maryland Street to the Waterfront)	60'	12'SW/ 8'P/ 10'S/ 10'S/ 8'P/ 12'SW
Louisiana Street North (20th Street to 21st Street)[3]	30'	20'/ 10'SW
Louisiana Street South (21st Street to 22nd Street)	54'	12'SW/ 11'/ 11'/ 8'P/ 12'SW
Maryland Street North (20th Street to 21st Street)	60'	12'SW/ 8'P/ 10'S/ 10'S/ 8'P/ 12'SW
Maryland Street Center (21st Street to 22nd Street)	60'	12'SW/ 8'P/ 10'S/ 10'S/ 8'P/ 12'SW
Maryland Street South (22nd Street to southern site boundary)	62'	12'SW/ 8'P/ 11'S/ 11'S/ 8'P/ 12'SW
Michigan Street[3]	54.5'	10'SW/ 13'/ 13' / 18.5' L

1Actual sidewalk width may vary due to irregular historic building frontages

2With additional 8" building encroachment zone at building 105 due to irregular historic building frontages

3Retained as Port Street rather than dedicated to City as a public right-of-way

4With additional 5" building encroachment zone at building 113-116 due to irregular historic building frontages

SW – Sidewalk

B – Bicycle Lane

P – Parking Lane

BT – Bay Trail

S – Sharrow

L – Loading

2.1.3 SPECIAL TREATMENTS

PROJECT APPROACH

The Project Site is uniquely situated between the existing Dogpatch neighborhood and the waterfront with no through connections in the north-south direction. Its location means the new street grid is intended to serve local access only at low speeds: there are no throughways designed to move large volumes of traffic between different parts of the City. The streets in the Project Site are a closed loop that represent the end of the road.

Based on its location and character, the Project includes tactile treatments on portions of Maryland Street, 20th Street, and Waterfront Street. These treatments emphasize public open space character.

BENEFITS

Use of tactile treatments has the following benefits:

- Consistent with historical character of the site.
- Emphasizes pedestrian and public open space character to connect parks and plazas across street and generally serves as an extension of open space network.
- Improves land value and long-term development success by creating a distinct and high-quality public realm.

APPLICATION

Paving should appear as an integrated, coherent design of patterns, materials, and colors that serves to demarcate zones of different use. Paving textures should be smooth and vibration free. Because of the additional care and cost of maintaining enhanced features, an independently-managed entity – such as a Maintenance CFD or Business Improvement District - would be responsible to maintain these features separate from typical SFPW maintenance operations (See Section 5.2 on Maintenance).

In order to delineate the boundary between pedestrian and vehicular zones for people with visual impairments, color-contrasting detectable warning pavers will be provided at the edge of the roadway. A detectable warning is a feature built into or applied to walking surfaces to warn visually impaired persons of hazards in the path of travel. Per California Building Code (Section 11B-705.1), the detectable warning pavers must be a minimum 36-inches wide and comply to SFPW and State of California technical standards, including a 70 percent minimum visual contrast with adjacent walking surfaces.

The final design for special treatment areas will be determined during the Improvement Plans phase.

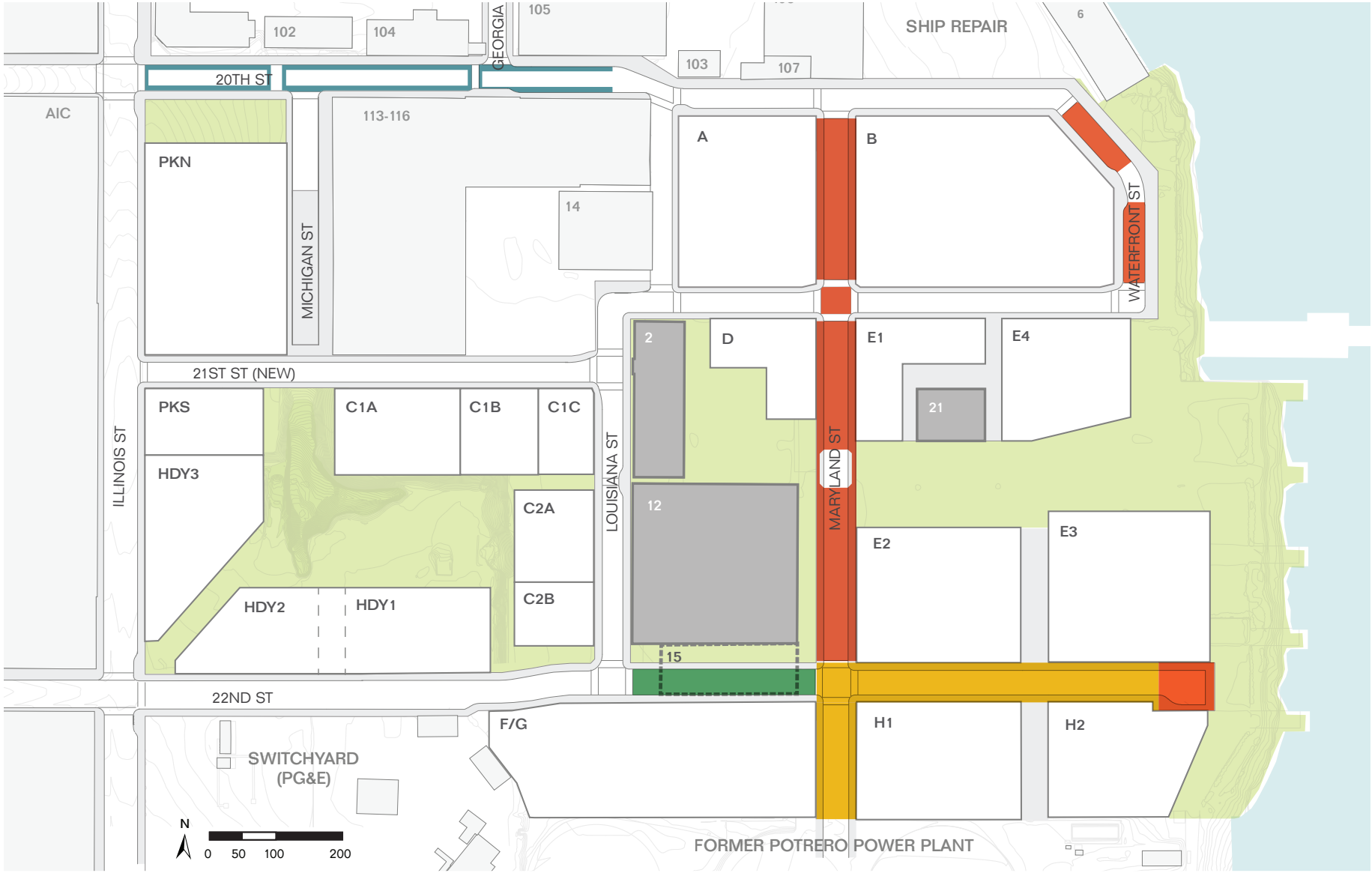


FIGURE 2.1.3: Special Treatment Areas

2.2 GRADING AND RETAINING WALLS PLANS

2.2.1 PROPOSED GRADING PLAN

As previewed in Chapter 1, the site has varying topography, sloping down toward the Bay, with a significant change in elevation along 22nd Street between Illinois and Louisiana Streets. As shown in the grading plan Figure 2.2.1, the proposed Project will raise the grade of the site by adding up to ten feet of fill in order to help protect against flooding and projected future sea level rise. As a result, most of the street will be on a gradual slope, except at very limited segments where topography requires a less than eight percent slope. Roadways, gutters, and sidewalks must have a surface slope of no less than 1% for crosswalk areas and curbed sidewalk areas that are flush with street level. Pedestrian areas (including crosswalks) shall have a maximum cross slope of 1.67%.

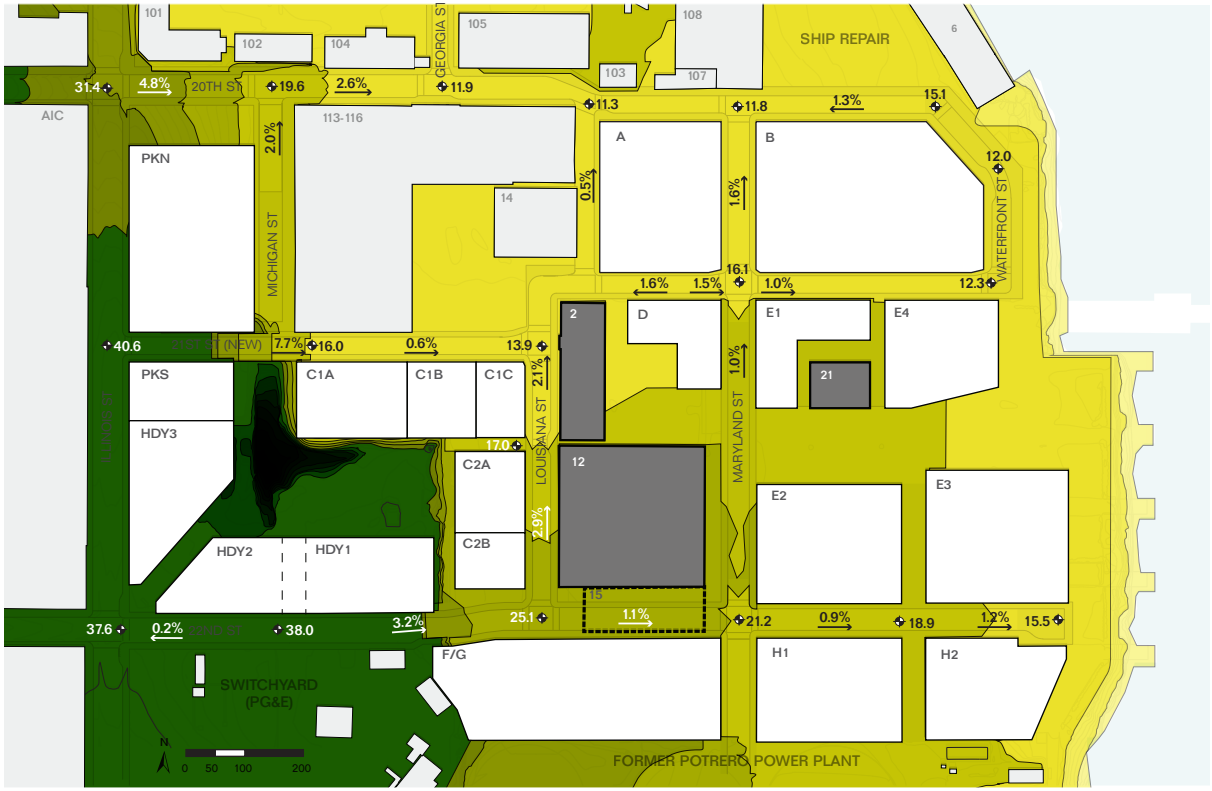


FIGURE 2.2.1: Proposed Grading Plan

2.2.2 PROPOSED RETAINING WALLS PLAN

Several retaining walls are required within the Project Site to accommodate the varying topography at the edge of the roadway. The locations of proposed retaining walls are shown in Figure 2.2.2. There are three categories of retaining walls.

EXISTING RETAINING WALLS WITHIN FUTURE CITY ROW

There is an existing retaining wall located on a portion of the current Port-owned 20th Street fronting the northwest side of Building 113 that will be preserved. The retaining wall is necessary, as the wall of the historic building it fronts cannot be filled against due to preservation requirements.

PERMANENT RETAINING WALLS WITHIN CITY ROW

Permanent retaining walls within the City ROW will be owned and maintained by the Port in a Major Encroachment. This includes the following areas:

- 21st Street fronting Building 116 where a retaining wall will be constructed along the face of the building under the sidewalk

POSSIBLE INTERIM RETAINING WALL MAY BE REQUIRED WITHIN CITY ROW

An interim retaining wall within the City ROW in the event an easement is unattainable from the property owner. The sidewalk where the interim retaining walls occur will be built to the 12' condition as part of the adjacent redevelopment of the site. This includes the following areas:

- 22nd Street at northern limit near the Hoedown Yard. In the future, when Parcel HDY1 is developed, the retaining wall will be removed and the building structural wall will be constructed to the front lot line.
- 22nd Street fronting the existing PG&E Switchyard where the existing road grade will be lowered.

PERMANENT RETAINING WALLS LOCATED OUTSIDE OF CITY ROW

Permanent retaining walls located just outside of the City ROW on Port property to support the ROW where it is higher than adjacent area or conversely support the adjacent area where it is higher than the roadway. This includes the following areas:

- 20th Street fronting the Shipyard parking lot to the north near Building 6
- 21st Street at the end of Michigan Street to the north
- 21st Street fronting Irish Hill Park to the south

The retaining wall type will be selected during design of improvements based on a number of factors, including cut versus fill condition, adjacent ownership, and allowance for elements such as tie-backs or geogrid.

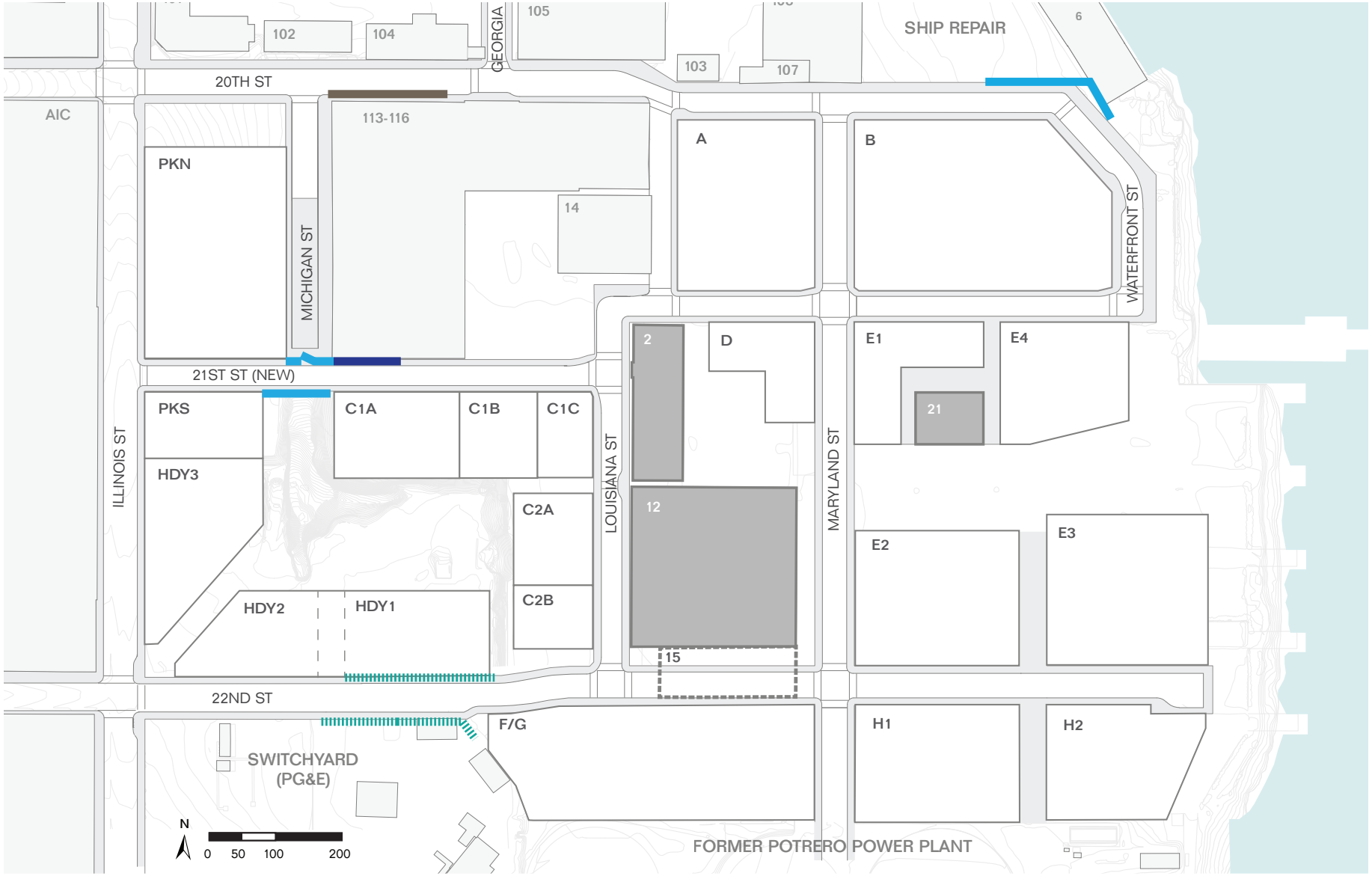


FIGURE 2.2.2: Proposed Retaining Walls Plan

Existing Retaining Walls within Future City ROW
Permanent Retaining Wall within City ROW
Permanent Retaining Wall outside of City ROW
Possible Interim Retaining Wall within City ROW

2.3 OVERALL CIRCULATION NETWORKS

2.3.1 PEDESTRIAN NETWORK

The streets within the Project are designed to create a safe and comfortable experience for travelers of all modes, especially pedestrians. As shown in Figure 2.3.1, the open space and streets – from the Historic Core through Maryland Street to the waterfront – is designed for pedestrian safety. A mix of both direct and meandering pathways provides multiple ways for one to traverse from Illinois Street to the waterfront. Grading will be updated in the Improvement Plans and will meet the accessibility criteria.

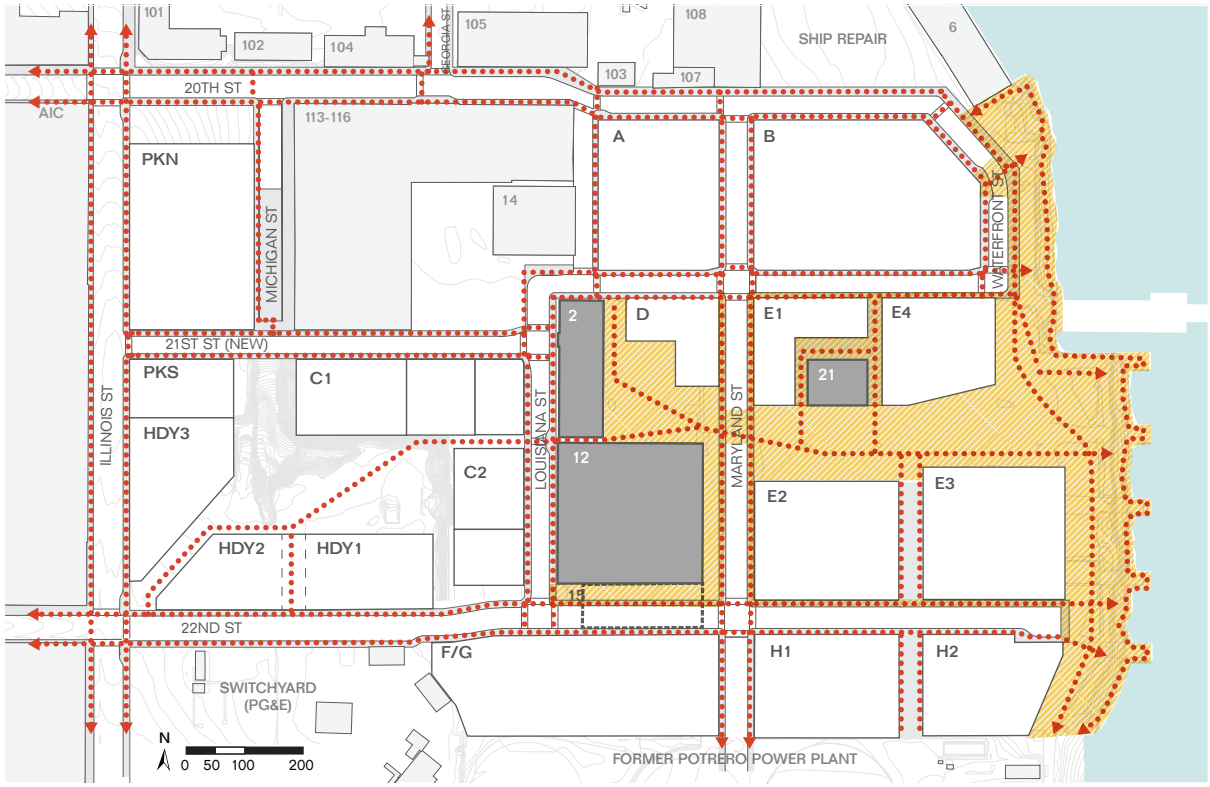


FIGURE 2.3.1: Pedestrian Network

2.3.2 BICYCLE NETWORK

To foster safe and efficient bicycle circulation, the Project extends the regional Blue Greenway/ Bay Trail (Bay Trail) along the shoreline and adds additional designated Class 2 and sharrow (Class 3) bicycle routes for internal circulation. The Bay Trail and Blue Greenway extends from Crane Cove Park at Georgia and 20th Streets. It continues as a separated bike facility along 20th Street to the water, then as a shared use trail along the shore through the waterfront park. At the southern end, the trail will temporarily access Illinois Street via 22nd Street, but will be designed to connect to any future extension of the Bay Trail directly south of the site. The west portion of 22nd Street from Illinois Street to Louisiana Street accommodates a 5.5-foot wide Class 2 bike lane on both sides of the street to facilitate movement in steep portions of the street. Rest of the 22nd Street is a sharrow connecting the neighborhood to the waterfront. Maryland is designated as a sharrow, creating a north-south connection between the bicycle facilities at 20th and 22nd Streets. A bike-share facility will be provided on 22nd Street just east of Louisiana Street. A future bike-share station may be added on 20th Street near Illinois Street as demand warrants. In addition, bike storage facilities will be provided in the form of bike racks located in furnishing zones and potentially bike corrals located in parking lanes.

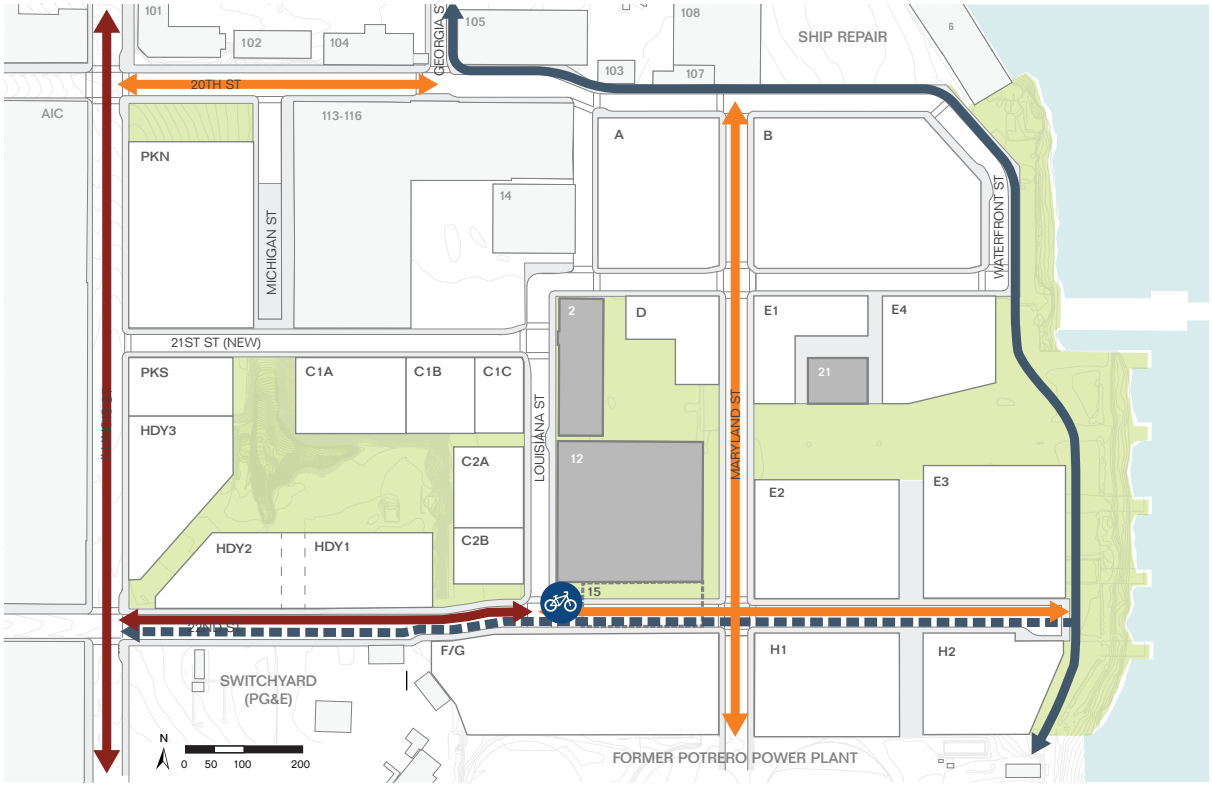


FIGURE 2.3.2: Bicycle Network

FIGURE 2.3.3: Trail Example

2.3.3 VEHICULAR NETWORK

The Project's transportation network accommodates vehicular access to parcels and open spaces with two-way circulation throughout, except for the northern segment of Louisiana Street. Street parking, drop-off zones, and traffic-calming measures are integrated into the design to support safe movement of cars, pedestrians, and bicycles. Streets in the Project Site are designed for SU-30 vehicles generally up-to 30 feet in length to serve neighborhood commercial and residential streets. Accommodation for various vehicle types is summarized in Sections 2.6 to 2.8 and associated turning study is compiled in Appendix (Pier 70 SUD Vehicular Turning Supplement) as part of Pier 70 SUD SSMP for approval. The Vehicle Turning Supplement includes turning studies for vehicles including emergency vehicles, MUNI buses, TMA shuttles and commercial vehicles.

Vehicle travel lane widths are minimized as narrow as 10 to 11 feet to reduce vehicular speeds, except at Louisiana Street North which is 20 feet wide, and Waterfront Street which has 12 foot lanes. Traffic signaling devices will be located at the intersections of Illinois Street with 20th Street, 21st Street, and 22nd Street where the Project connects to adjacent street grids.

Accessible Pedestrian Signal (APS) push buttons shall be installed where traffic signalization is added and be in accordance with SFPW Street Crossing Standard and Director's Order No. 185854.

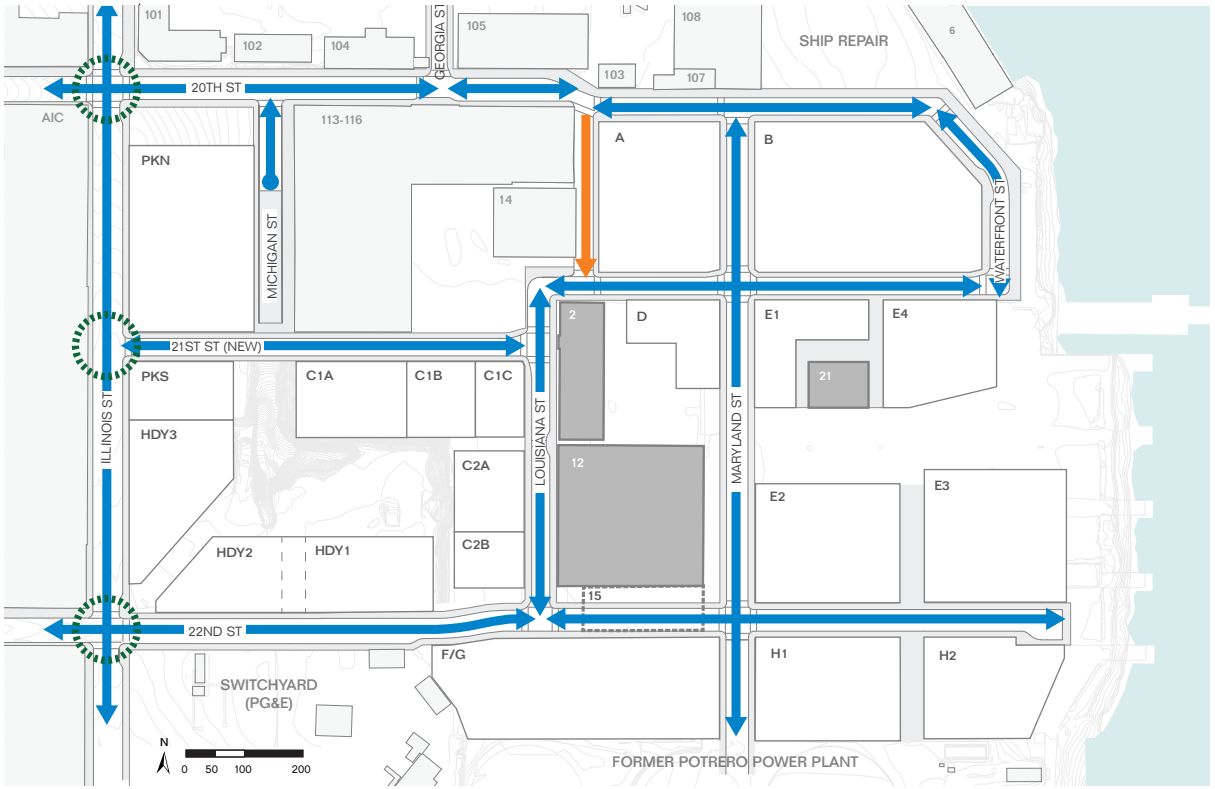


FIGURE 2.3.4: Vehicular Network

2.4 ON-STREET PARKING & LOADING

2.4.1 PARKING PLAN

On-street parking supports retail, providing customers with easy access to stores and businesses. Additionally, on-street parking serves as a traffic calming measure and buffers pedestrians from adjacent traffic. The Project provides a balanced amount of on-street parking in the locations shown in

Figure 2.4.1. Street parking may be removed as needed for fire access zones, on-street loading, drop-off zones, and to accommodate truck turning.

All on-street parking spaces are metered. All parking meters and other street elements are located in the furnishing zone and follow design guidelines by SFMTA/SFPW.

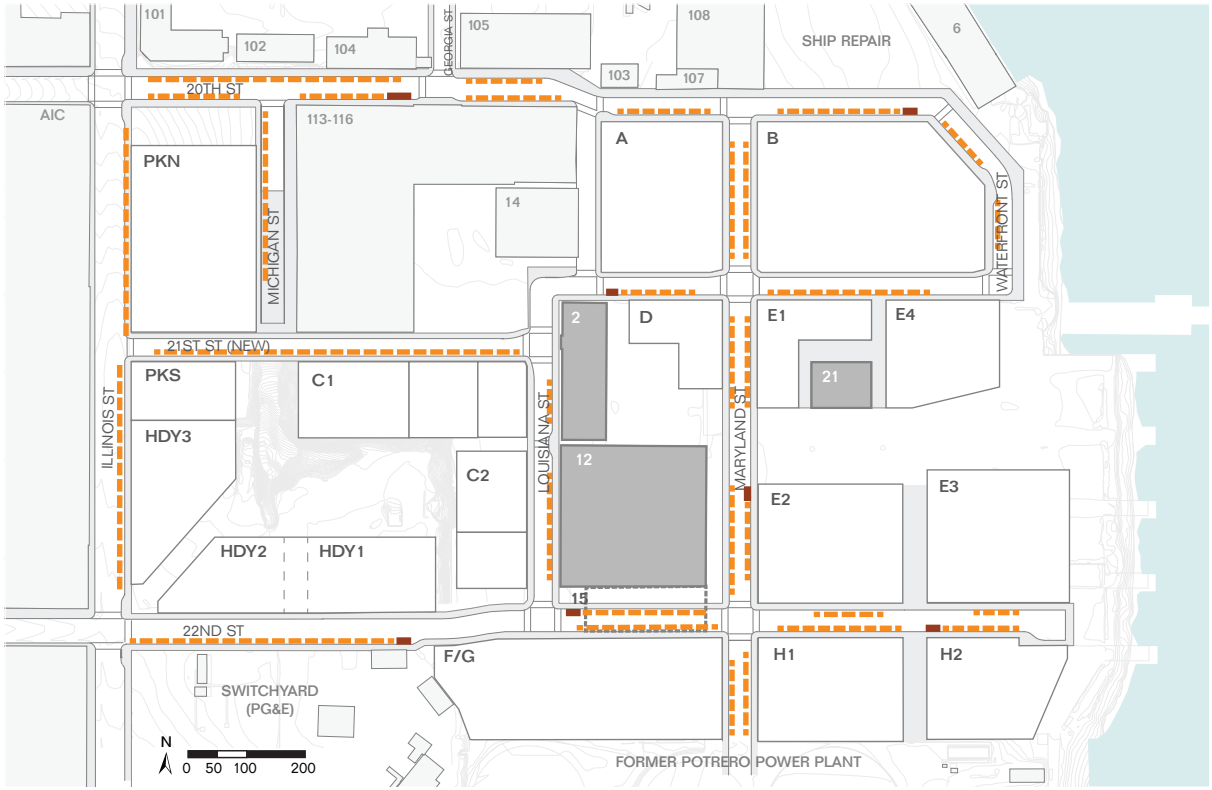


FIGURE 2.4.1: On-Street Parking Zones

2.4.2 UNIVERSAL PASSENGER LOADING & ACCESSIBLE PARKING ZONES

On-street universal passenger loading zones and accessible parking zones are located at select locations distributed throughout the site, providing convenient access to the site's buildings and open spaces based on proximity and topography. This section provides an overview of the site-wide approach and standard design of loading and accessible parking zones.

The applicable standards for accessibility of parking at a public facility are contained in the 2010 ADA Accessibility Standards and Title 24 of the California Code of Regulations (i.e. the California Building Code, Chapter 11B), whichever is more stringent.

UNIVERSAL PASSENGER LOADING

Passenger loading zones are curbside stalls for pick-up and drop-off, limited to five-minute stops per SFMTA regulations. In addition, idling for more than 30 seconds is discouraged. Drivers must remain with the vehicle. The plan identifies five universal passenger loading zones within the Project. Each is universally accessible and ADA compliant, and provides a wheelchair access aisle along the passenger side of the car and access to the sidewalk via a SFPW standard curb ramp. Generally, universal passenger loading zones are located to provide convenient access to buildings, crosswalks for easy access across the street, and parks and open spaces.

Standard accessible passenger loading stalls:

- 20-foot stall, adjacent sidewalk clear of objects
- 10-foot loading area at rear, with SFPW standard curb ramp

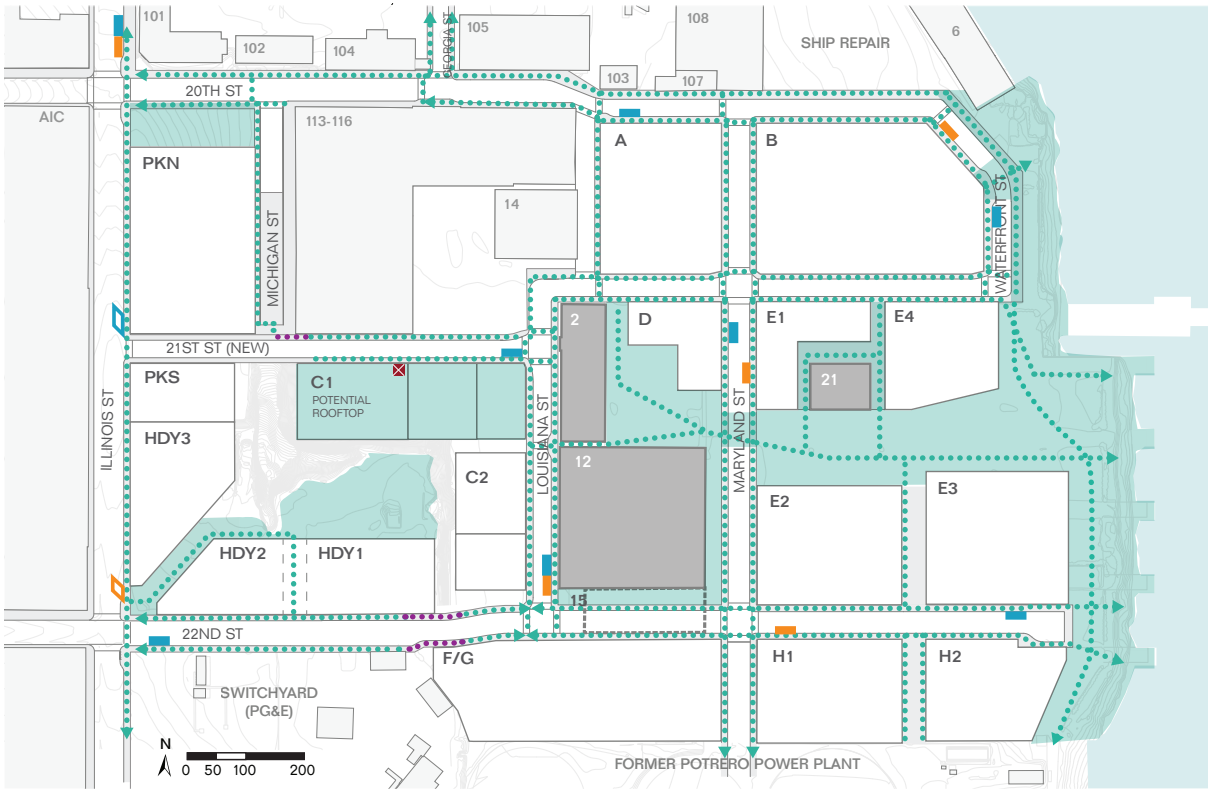


FIGURE 2.4.2: Accessible Parking & Universal Passenger Loading Zones

ACCESSIBLE PARKING

Accessible parking stalls ensure convenient, equal parking access for drivers and passengers with a valid disabled parking permit. Generally, accessible parking stalls are located at the beginning of the block, utilizing the street corner curb ramp or bulb-out for access to the sidewalk as illustrated in Figure 2.4.3.

Where on-street parking is provided, accessible on-street parking spaces are included on the same street. Based on the total quantity of on-street parking stalls for the project, eight ADA accessible stalls have been provided in accordance with ADA and CBC Chapter 11B requirements (See Table 11B-208.2).

Standard accessible parking stalls:

- 20-foot stall, adjacent sidewalk clear of objects
- 10-foot loading area at rear, with SFPW standard curb ramp

ADA parking and universal passenger loading zones are located where street and sidewalk slope are minimal while providing reasonable dispersion throughout the site

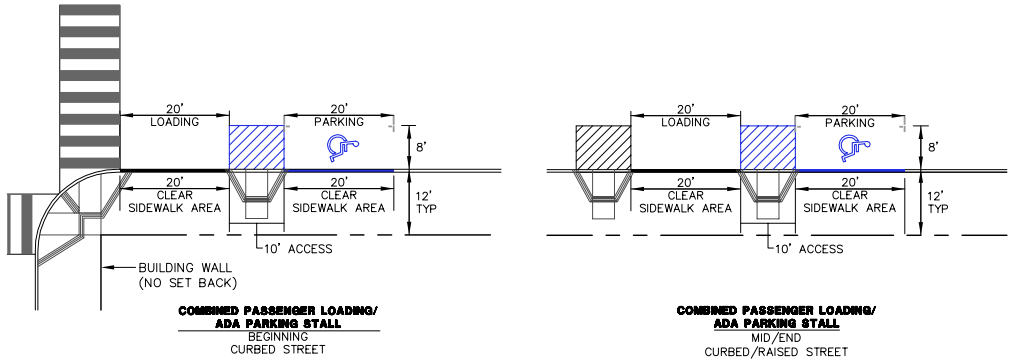


FIGURE 2.4.3: Combined Accessible Parking & Universal Passenger Loading Zone

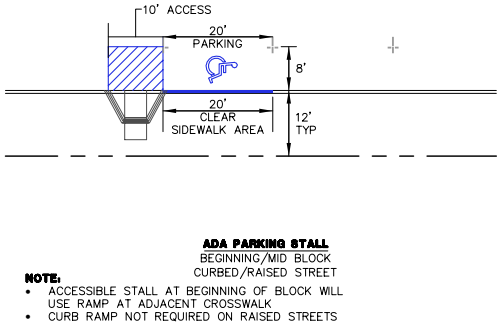


FIGURE 2.4.4: Accessible Parking

2.5 SERVICE LOADING AND VEHICULAR ACCESS

2.5.1 ON-STREET AND OFF-STREET LOADING ACCESS

On-street and off-street service loading access is generally located on 21st Street, Louisiana Street and mid-block passages as indicated in Figure 2.5.1 to maintain protected edges and prioritize pedestrian access on Maryland Street and Waterfront Street.

Loading space for each building is provided in accordance to requirements laid out in D4D per predominant use and Gross Floor Area. Loading for retail uses may be served by loading provided for other predominant uses within a building including residential, commercial/office, and light industrial.

2.5.2 VEHICULAR ACCESS

Driveways for vehicular access crossing sidewalks are located to meet the minimum width and frequency necessary to maximize the number of on-street parking available to the public and to minimize conflicts with pedestrian and transit movements. Dimensions and frequency of curb cuts follow the requirements in D4D.

Curb cuts are designed to prioritize pedestrian movement with a continuous material treatment extending from the sidewalk or pedestrian path over the vehicular path.

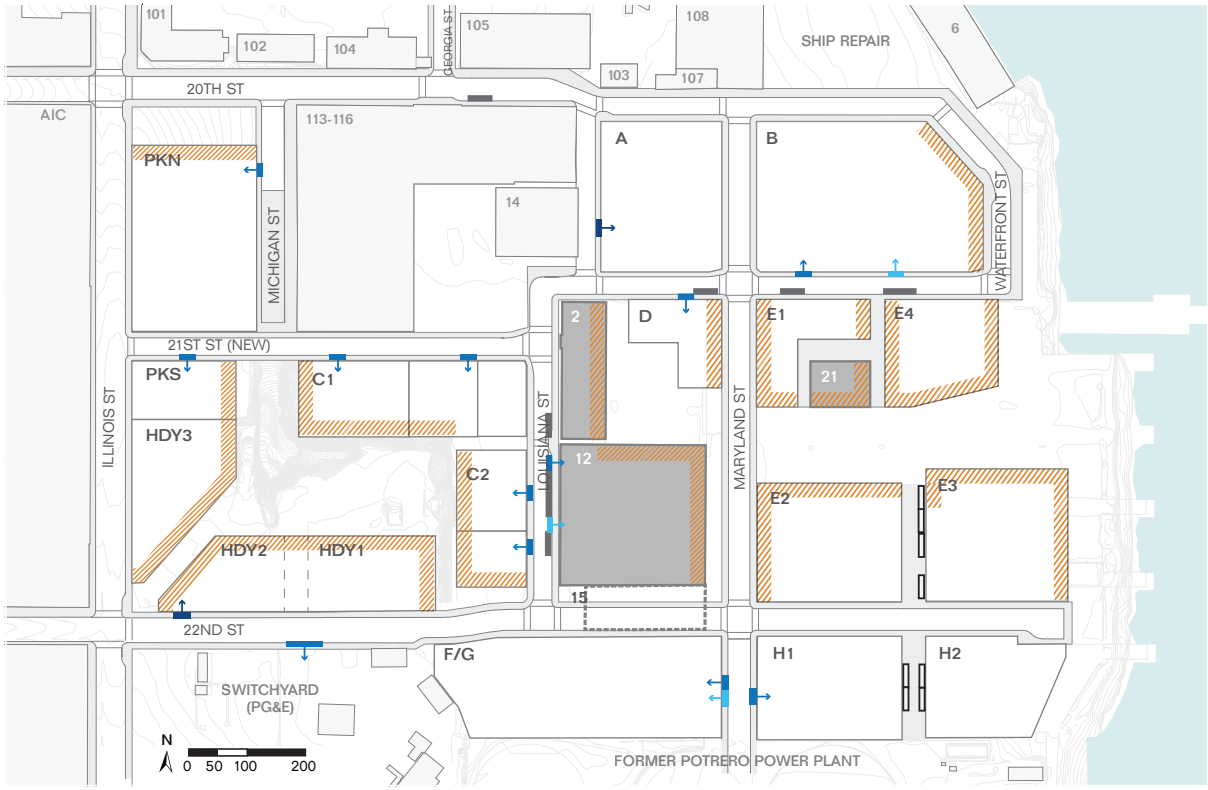


FIGURE 2.5.1: Loading and Vehicular Access

2.6 FIRE & EMERGENCY VEHICLE ACCESS

2.6.1 FIRE TRUCK & EMERGENCY VEHICLE ACCESS

EMERGENCY VEHICLE CLEAR PATH & ACCESS POINTS

Figure 2.6.1 identifies streets that provide a minimum 26 feet clear path of travel within the ROW. This clear path includes one foot of each adjacent parking lane, and may include the width of a bicycle lane, except where separated by any objects that would obstruct the emergency vehicle's path of travel. The clear path dimension may include multiple vehicular travel lanes in both directions.

Per the 2015 City Subdivision Regulations, where the ROW does not accommodate a 26 feet clear path along a building's entry and where building construction type is not Type I, a minimum of one "localized fire access zone" with a minimum of 26 feet wide clearance is provided per building, each with minimum 100 feet in length parallel to the curb. Each fire access zone provides the San Francisco Fire Department (SFFD) primary access to the Fire Alarm Control Panel (FACP) access to the entire building and standpipe.

FIRE ACCESS ZONE

Fire Access Zone is shown schematically with minimum 100 feet in length. Final length of Fire Access Zone to be determined at time of building permit of fronting building. In addition, turning studies are provided in the Appendix illustrating how an approaching fire ladder truck or engine can pass the Fire Access Zone.

FIRE ACCESS THROUGH PARKS AND PASSAGEWAYS

Additional fire access amenities shall be provided via public access, such as through park areas or passageways. All fire access paths of travel located in open space areas are clear of fixed obstructions.

A fire access to Building 21 is provided at its southern façade, with a 26 feet wide clear path of travel provided in front of the entrance to Building 21 within the Slipways Commons with max length of 150 feet.

Fire access on Michigan Street will be provided by a 150 foot-long EVA starting at 20th Street.

An additional fire access is provided for Building E3 through the passageway between E2 and E3. This also serves as a turnaround at the terminus of 22nd Street in compliance with the turning requirement.

STRUCTURAL FRAME

Building 15 presently attached to the southern side of Building 12, will be preserved as a structural frame, over a portion of 22nd Street. Vertical clearance should be a minimum of 13'6" for passage of fire vehicles and fire access points are provided outside of the area containing the Structural Frame.

ROAD WEIGHT CAPACITY

All pathways provided for emergency vehicles, whether on roadways or through public parks and passageways, shall support a minimum of 75,000 lbs.

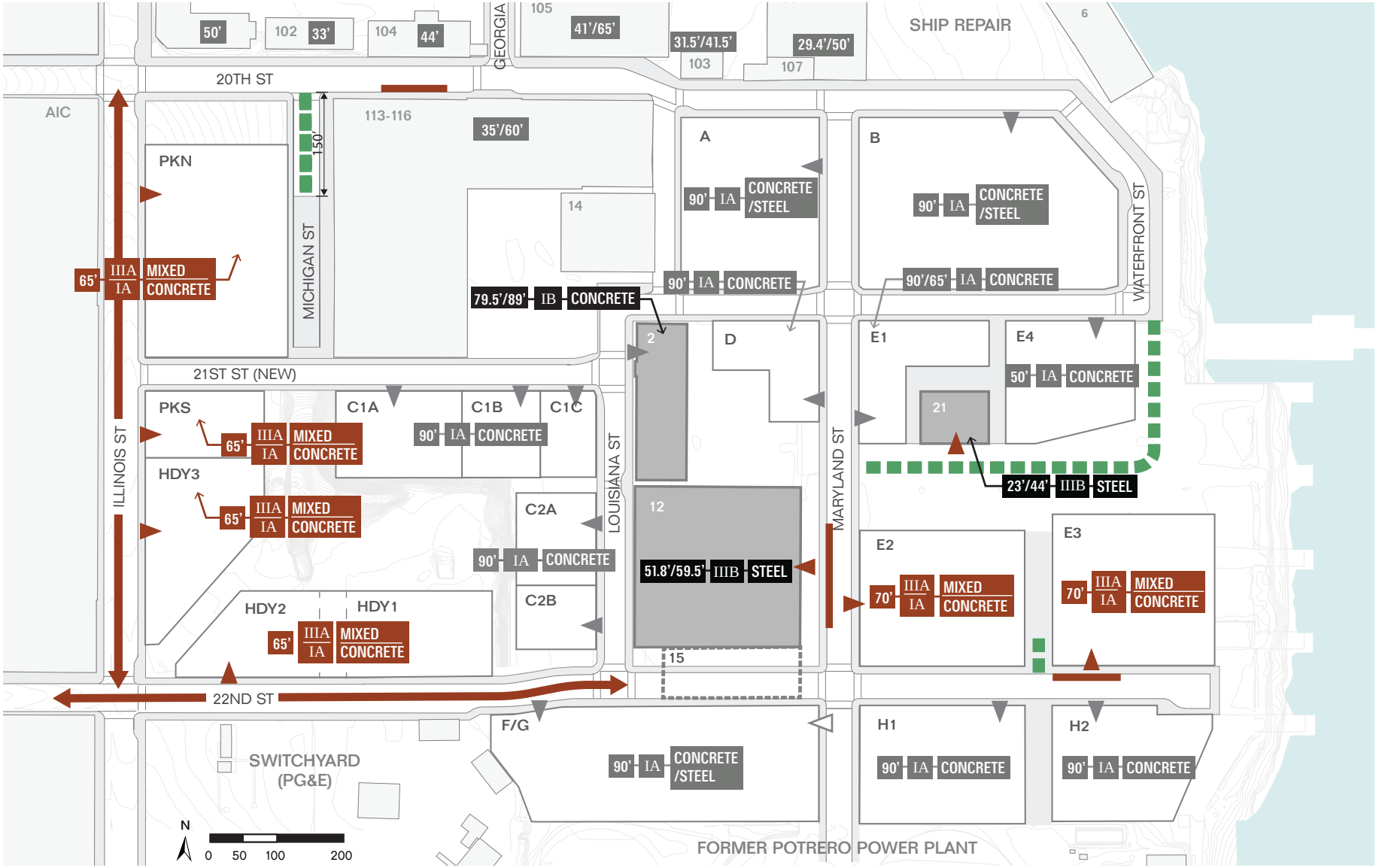


FIGURE 2.6.1: Primary Fire Truck/ Emergency Vehicle Access

Notes:
Future changes to building type may require additional study of fire access zone locations.

Anticipated Construction Type & Fire Resistance

Building Height Eave/Top ← #' IA XXXXX → Anticipated Primary Structural System

- ROW with 26' Clear for Fire Access
- Minimum 100' Localized Fire Access Zone
- Fire Access within Open Space, Passageway, or Port Street
- New Construction – Type I
- New Construction – Others
- Historic Buildings

Anticipated Building Entrance/ Fire Panel Access
- For Construction Type I
- For Other Construction Types
- For Parcel G Residential Scenario (Type I)
- Building 15 Structural Frame

2.6.2 SFFD TRUCK TURNING REQUIREMENT

In accordance with SFFD requirements, intersections are designed to accommodate various vehicles deployed during emergency situations. These vehicles include the 57-foot Articulated Fire Truck (ladder truck), the FE-34 and the FE-30. Generally, the ladder truck dictates intersection geometry. The FE-34 and FE-30 vehicles are similar in size, with the FE-34 being slightly larger. As shown in Figure 2.6.2, the FE-34 and FE-30 vehicles' turning movements are similar. The FE-34 turn movement is more restrictive, and therefore has been used as a basis for street layout designs. See Appendix for fire truck turning movements for the 57-foot Articulated Fire Truck and FE-34 vehicles.

While Fire Trucks may encroach into oncoming travel lanes to complete turning movements, at each intersection the design allows for a seven-foot refuge area for vehicles traveling in the opposing direction of travel.

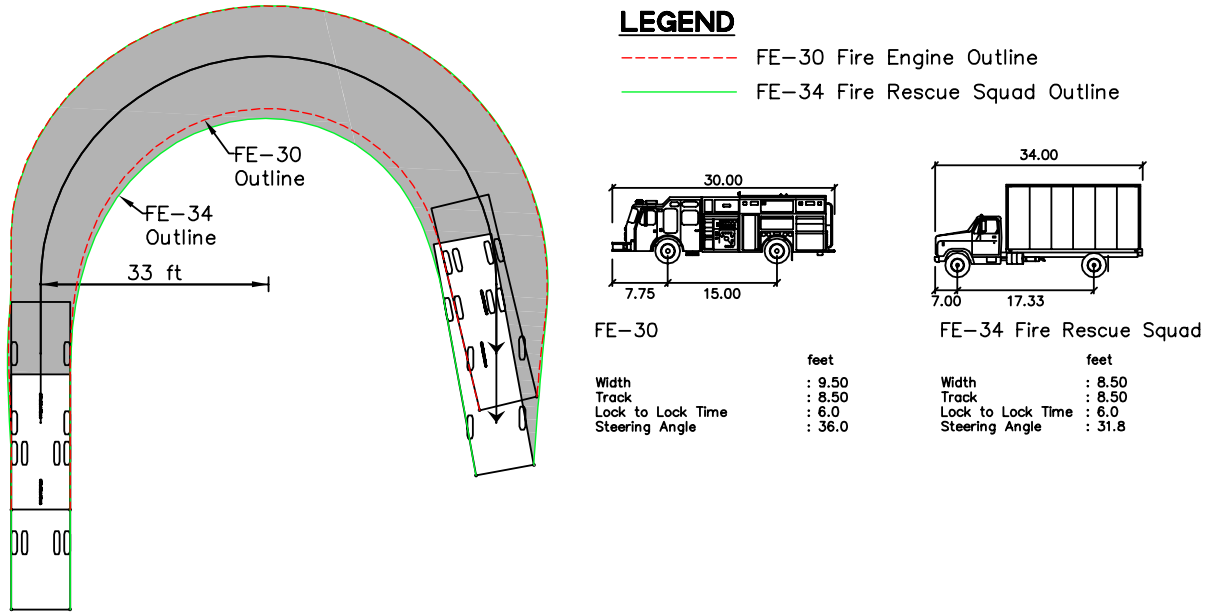


FIGURE 2.6.2: SFFD FE-30 and FE-34 Truck Turning Comparison

2.7 COMMERCIAL TRUCK TURNING

The Project Site is generally designed for SU-30 vehicles. On streets without curb-side parking, due to the lack of space needed to design for SU-30, minor accommodations will be permitted and curbs, and adjacent development parcels are chamfered in order to minimize accommodations at these locations. Turning studies documenting these minor accommodations are provided in the Appendix.

2.7.1 TRACTOR TRAILER TRUCKS

Commercial trucks larger than SU-30, up to and including WB-40 can be accommodated on site with assistance, such as flaggers and loading attendants. The frequency of deliveries with large trucks east of Louisiana Street is anticipated to be low based on the intended land uses. The programming in buildings 21 and E4 – which are zoned as retail, arts, and light industrial (RALI) – is anticipated to consist predominantly of less trucking-intensive uses focused on retail and arts. Truck deliveries to commercial buildings will be on a routine, predictable schedule and will be controlled by the building owner or operator.

The Developer will prepare a Driveway and Loading Operations Plan (DLOP) to reduce potential conflicts between truck deliveries – including driveway operations and loading activities – and pedestrians, bicycles and vehicles. The DLOP will include a set of guidelines related to required truck routing, size restrictions, assisted guidance by flaggers for difficult turning maneuvers, securing areas of conflict before truck movement, vehicular access restrictions during delivery operations, operation of driveways into the loading facilities, loading/unloading procedures and time limits, permitting for curbside loading activities, and will specify driveway attendant responsibilities.

The Developer will submit the DLOP for review and approval by the Planning Department and the SFMTA. Building owners and operators will be obligated to comply with the DLOP through purchase and sale agreements or leases. As appropriate, the DLOP could be periodically reviewed the Planning Department and SFMTA and revised to more appropriately respond to changes in street or circulation conditions.

In addition, to allow for continued commercial uses at the Historic Core, a route has been provided to allow for larger commercial vehicles (WB-50) to access 20th and Louisiana Street, and exit the site at 22nd Street. See Figure 2.7.1, indicating the WB-50 truck access route. WB-50 trucks will also be subject to assisted guidance by flaggers for difficult turning maneuvers.

Signage will be provided directing large trucks to enter the site at 20th Street.

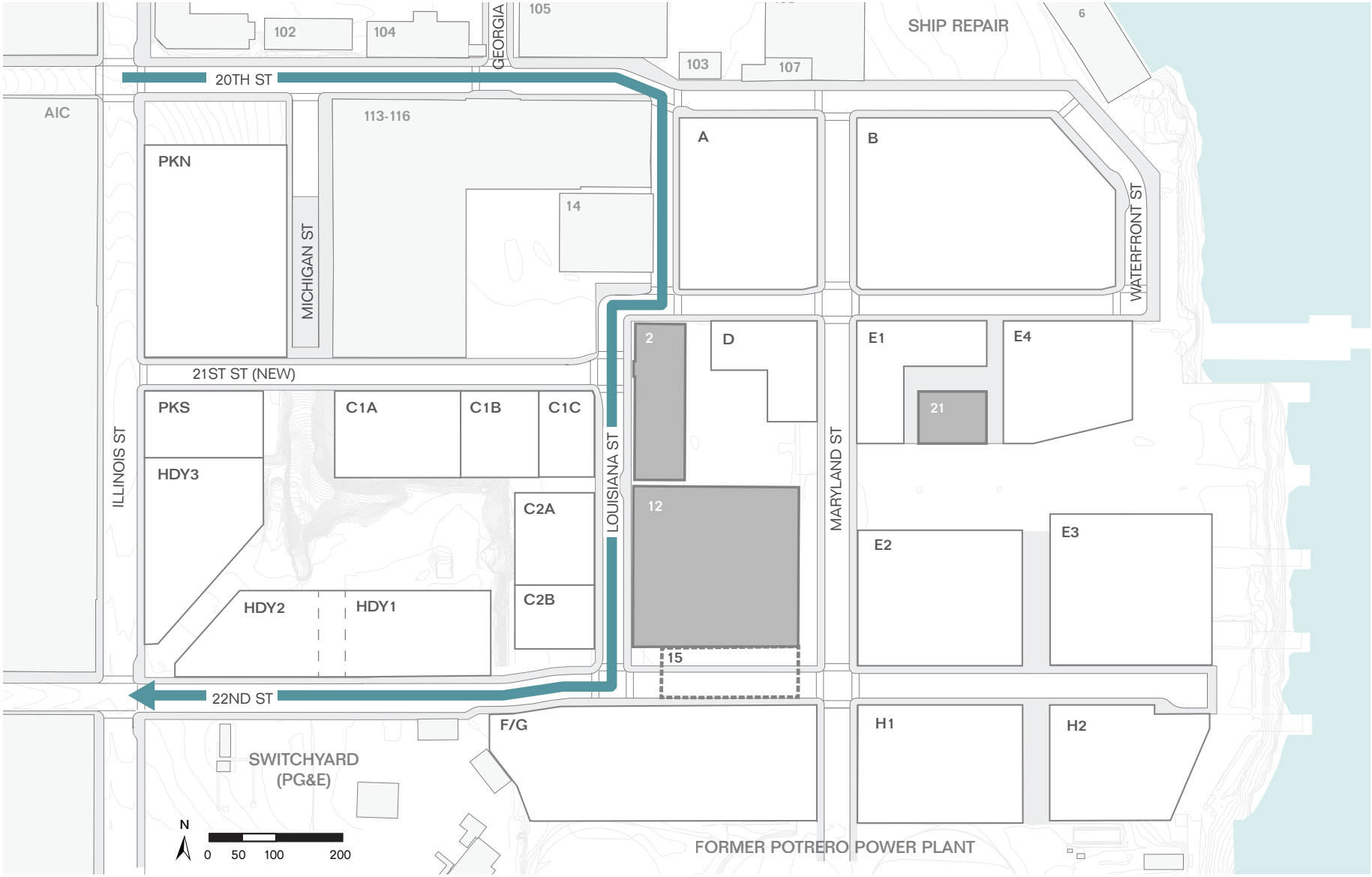


FIGURE 2.7.1: WB-50 Truck Access Route

2.8 TRANSIT

The project will establish a Transportation Management Agency (TMA) to coordinate and implement Transportation Demand Management (TDM) strategies and provide a shuttle service to connect the site to regional transit hubs, including BART and Caltrain, and to local hubs.

2.8.1 MUNI BUS

The SFMTA is currently analyzing potential MUNI bus routes for access to the Pier 70 Project Site and the former Potrero Power Plan site the South. SFMTA identified the route shown on Figure 2.8.1, entering at 22nd Street and turning south on Maryland Street with turnaround in the former Potrero Power Plant site for exit on the same route in the opposite direction. Turning diagrams showing bus movements through the designated route are included in Appendix.

MUNI stops for a 40' standard bus will be added at the near-side locations shown in Figure 2.8.1 just prior to commencement of the MUNI bus route or with the last phase, whichever is earlier, and not necessarily with the phase in which they are located. SFMTA must notify developer at least twelve months prior to start of service to ensure adequate time for design and installation. These bus stops will be designed with transit bulbs with minimum length of 35' in accordance with the Better Streets Plan (Chapter 5.5, Transit Bulb-Outs) to avoid the need for buses to merge in and out of traffic and provide more space for the shelter and people walking or waiting for the bus.

Feasibility of bulbouts for muni stops will be studied in the future to confirm that addition of bulbouts will allow continued use by design or emergency vehicles as required. Implementation may require modification to the roadway such as compound radii at curb return, recessed stop bars at the intersection, or relocation of the bulbouts to midblock locations.

2.8.2 PIER 70 TMA SHUTTLES

The site design considers access by the Pier 70 TMA shuttle service, which will follow the primary route shown on Figure 2.8.1, entering via 22nd Street, turning onto Maryland Street, and exiting via 20th Street onto Illinois Street. The selected route provides effective service to the entire site as well as access to the heart of site between Slipways Commons and Market Plaza. A drop-off location has been designated on Maryland Street in front of Parcel E1 as shown in Figure 2.8.1. An alternative route is shown on the figure for movement of the Pier 70 TMA shuttle in case of Maryland Street closure due to temporary events. An alternative drop-off zone will only be located if weekend TMA shuttle service is activated during street closure events.

Shuttle service is intended to complement and not replace MUNI bus service to serve the needs of residents and employees. If there is a desire to connect the Pier 70 TMA shuttle to adjacent development south of the Project in the future, the route could follow the Commercial shuttle/MUNI bus route shown in Figure 2.8.1.

See Appendix for studies of proposed TMA shuttle circulation.

2.8.3 COMMERCIAL SHUTTLES

Should tenants request to add additional commercial shuttles to serve the Pier 70 Project Area and the former Potrero Power Plant in the future, the route could follow the Commercial shuttle/MUNI route shown in Figure 2.8.1.

The shuttles studied are similar in size and turning capabilities to the B-40 bus template that has been analyzed for the SFMTA bus route. Refer to Appendix for turning studies of these vehicles.

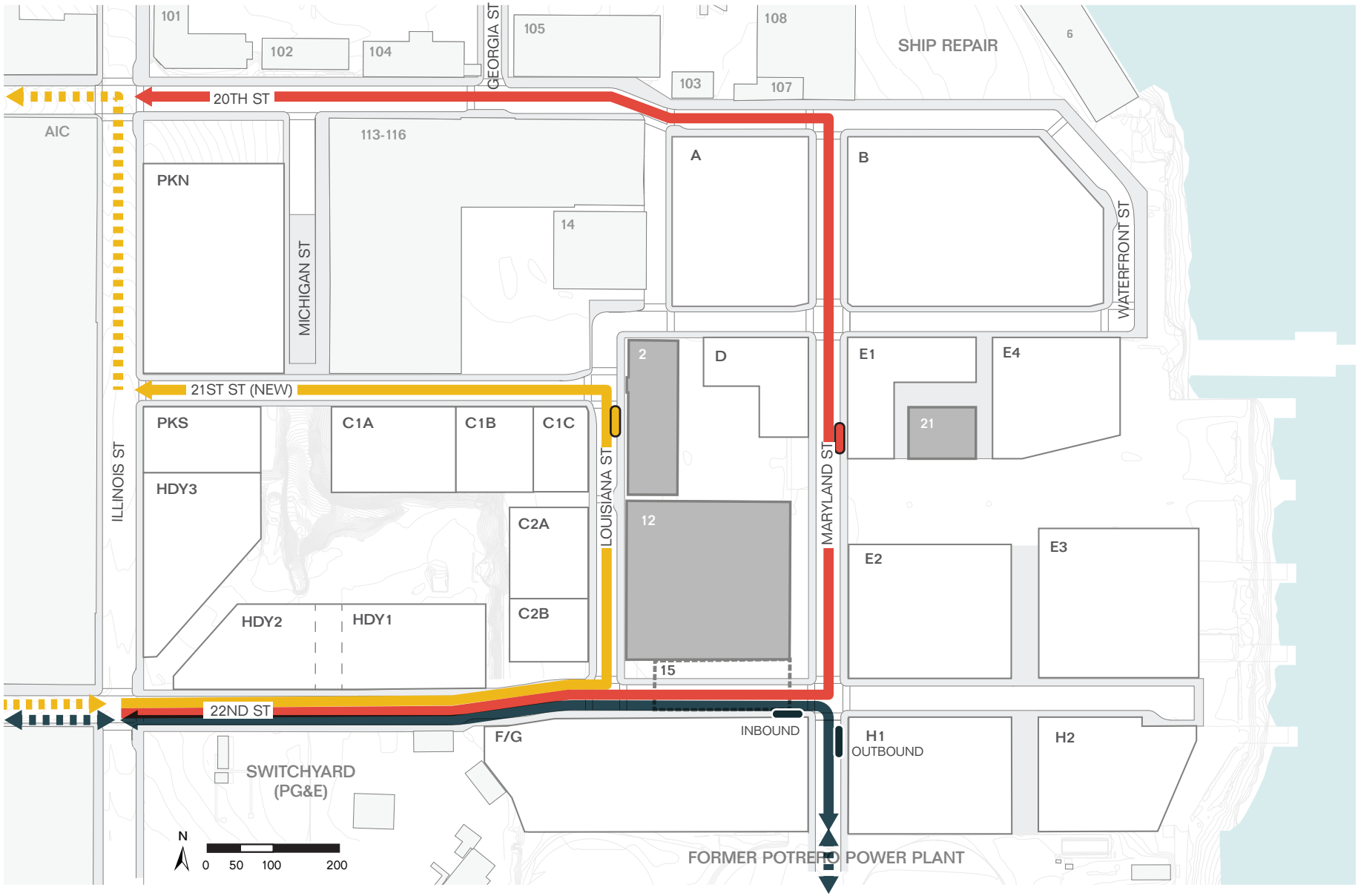


FIGURE 2.8.1: Conceptual Transit Access Route

2.9 TURNING ENCROACHMENT

2.9.1 TURNING ENCROACHMENT

Turning encroachments are areas where movements from vehicles such as fire trucks, buses, or commercial trucks, conflict with parking lanes. Future designs should restrict features such as parking stalls that would conflict with turning movements in designated encroachment areas. Areas of turning encroachment are shown in Figure 2.9.1. For more detailed turning studies showing the conflicting movements, please see the Appendix, Vehicle Turning Supplement.

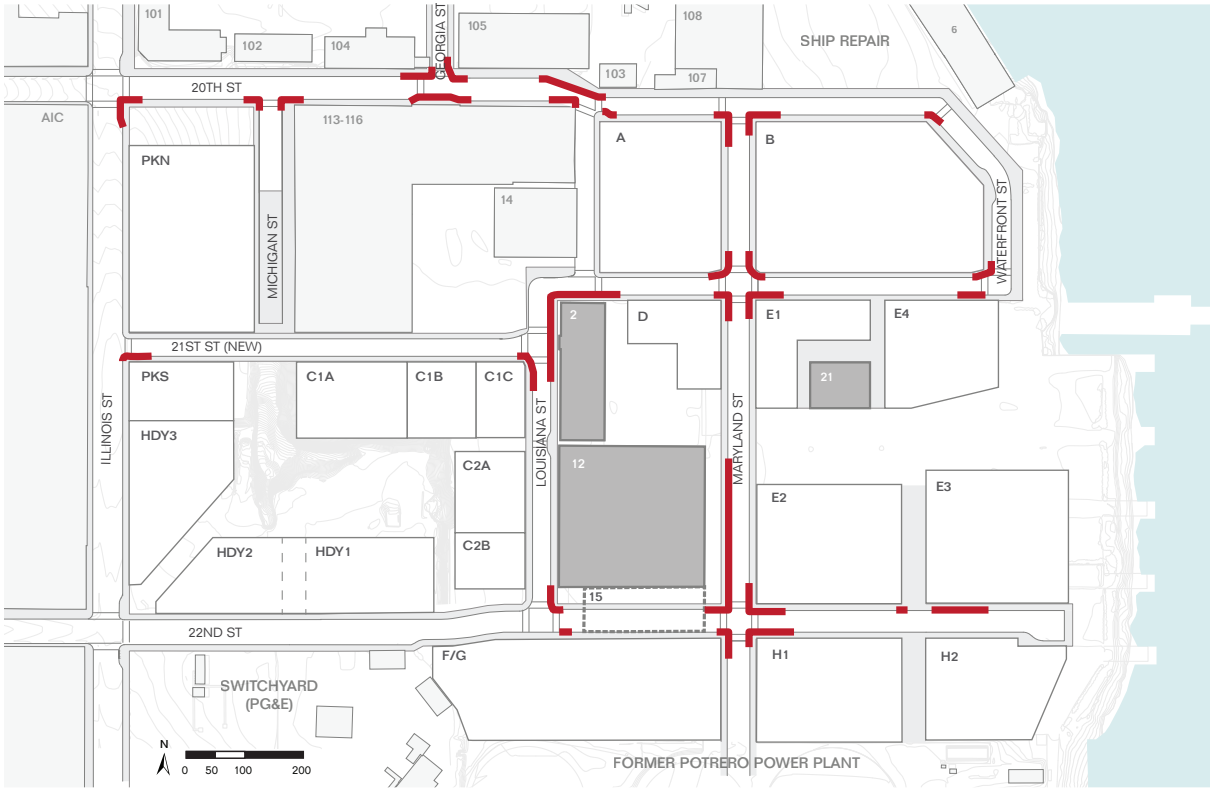


FIGURE 2.9.1: Turning Encroachment

2.10 SITE-WIDE DESIGN ELEMENTS

(Examples provided throughout this section containing palettes for paving, lighting, furnishings street trees, and plantings are intended for illustrative purposes only. Specific selections in the designs may differ, but will strive to maintain similar or equal characteristics.)

2.10.1 PAVING

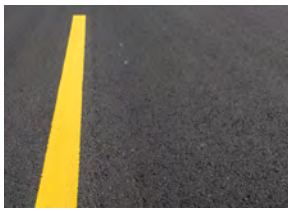
As the primary spaces for daily pedestrian life and vehicular circulation throughout the Project Site, the paving materials are designed to withstand extensive use, wear-and-tear, truck loading, and emergency vehicle access. Aside from including SFPW preferred and D4D recommended materials, the SSMP presents enhanced paving options that complement the Site's historic character, as well as the open space materials.

Note: Enhanced material options are noted as "Alt" in the material palettes in this chapter.

ROADWAY

Standard roadway asphalt is used on roadways that are designed for heavy traffic. Unit pavers are used as an enhanced special tactile treatment in certain areas of the Site. Unit pavers on a bituminous setting bed can withstand heavy traffic loads on a daily basis (see detail to the right, Figure 2.10.1). For roadway applications, smaller unit paver modules shall be used to avoid possible cracking due to heavy loads.

ROADWAY



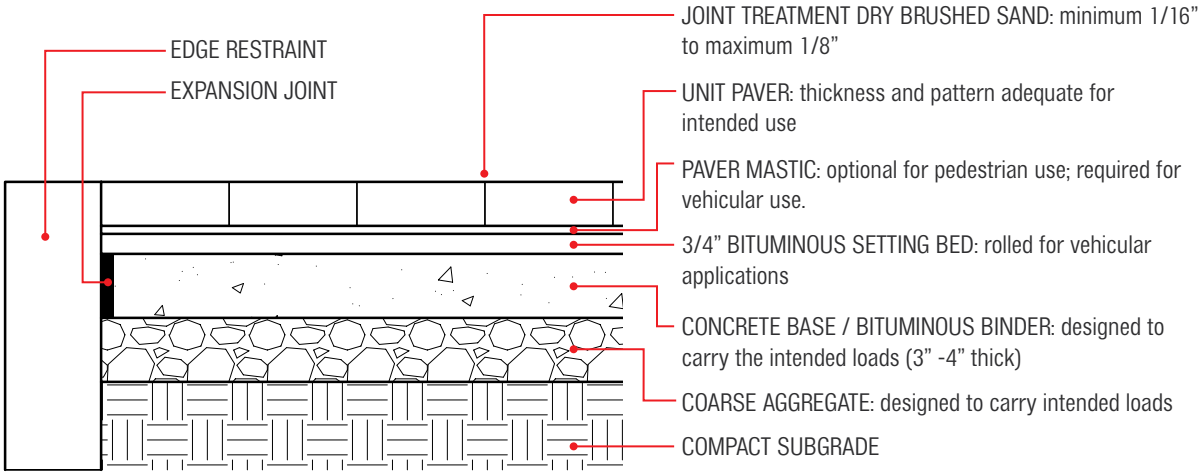
City Standard
Asphalt

Alt 1 CIP Concrete

Alt 2 Concrete Unit Paver

Alt 3 Asphalt Block

Alt 4 Cobblestone
Reuse of Existing Cobblestone underlying 20th Street



SCALE: 1" = 1'

FIGURE 2.10.1: Bituminous Setting Bed Detail

SIDEWALK

The project sidewalk mainly uses CIP concrete paving that complies with SFPW standards in colors and finishes. Concrete unit pavers are used in special treatment areas to enhance the Site's aesthetics and functionality. The unit pavers selected should meet accessible design requirements for firmness, stability, slip resistance, and surface smoothness. Changes in surface materials at sidewalks and roadways shall align with the crosswalk in a single straight line.

WARNING PAVERS

City standard detectable warning pavers shall be used.

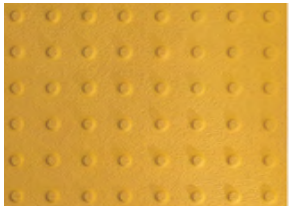
SIDEWALK

***CIP Concrete**
Natural Gray with Silica Carbide & Water Jet Finish

***Special Paving**
Concrete Unit Pavers
6"x18" Ground & Blasted Finish

Special Paving Alt 1
Asphalt Block
6"x18" Ground & Blasted Finish

WARNING PAVERS



***Warning Pavers**
Tekway

* Preferred product.

BAY TRAIL

Standard concrete paving is suggested with a wider jointing system. Porous concrete is considered as an option, in line with the Bay Trail design guidelines.

TREE WELL SURFACING & TRUNK OPENING MULCH

Cobblestones are used at tree wells for easy maintenance and material longevity. Cobblestones within the courtesy strip shall have smooth surface. Gravel mulch is used to cover the openings around tree trunks.

BAY TRAIL

Impervious Concrete

Alt 1 Porous Concrete

TREE WELL SURFACING

* **Cobblestone**
4”x8” Split Face Finish

Alt 1 Cobblestone
4”x8”Smooth Finish

TREE WELL TRUNK OPENING MULCH

Crushed Stone
Black Basalt

* Preferred material.

2.10.2 LIGHTING

The Project Site's general lighting strategy creates a vibrant and aesthetically pleasing experience that enables visitors to safely navigate streets and pathways, while creating a strong visual character. Lighting design for the Site prioritizes safety, comfort, mood, and historic character with a hierarchy of lighting types.

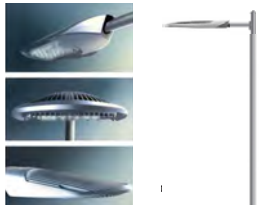
Street lighting responds to the particular location, including roadways, intersections, and sidewalks. Due to the historic character of the Site and Buildings, the selected lighting fixtures have been chosen for their simple forms that reflect the Site's industrial aesthetics. All street lighting must be approved by the SFPUC. Streetlights that are not approved must be privately maintained and will be subject to major encroachment permits.

All images shown reflect product choices only - natural weathered colors and finishes are preferred. Colors and finishes should be coordinated across the Site to ensure consistency of character.

* Preferred product.

POLE LIGHT

***Pole Light**
Hess 'Linea 600 LED'



Alt 1 Pole Light
Philips Lumec Roadfocus GPLM

BOLLARD LIGHT

***Corten Light Bollard**
Hess 'Linea S'

Alt 1 Corten and Cast Iron
Louis Poulsen 'Bysted'

SUSPENDED LIGHT AT BLDG 15 STRUCTURAL FRAME

***Suspended Light**
Hess 'Village'

Alt 1 Suspended Light
Landscape Forms 'Arne'

2.10.3 STREET FURNISHING

The furnishing is envisioned to support a wide variety of amenities. The primary materials for furnishings are steel and wood – either reclaimed from found beams and structures or crafted from resilient hardwoods.

Bollards in the pedestrian areas shall be at least 42 inches tall measured from the walking surface or other dimensions approved by SFPW.

Selected bike racks should avoid circular tubes, provide secure mounting, employ durable materials and meet other requirements in the SFMTA Bicycle Rack Specifications. Bike parking layout shall follow guidelines in the San Francisco Better Streets Plan.

Accessible seating positions for wheelchair users, as well as seating with backrests and armrests are to be integrated into seating layouts in order to accommodate all users.

Litter & Recycling Receptacles shall be anti-vandal. Selected receptacles shall provide options for waste, recycling, compost, ash or combined use. It should also be able to open from the side to allow easy access for maintenance.

In the palette to the right, the first images in each category are the preferred options; subsequent images in each group are alternates. All images shown reflect product choices only - natural weathered colors and finishes are preferred. Colors and finishes should be coordinated across the Site to ensure consistency of character.

* Preferred product.

FIXED + REMOVABLE BOLLARDS

*MaxiForce, Fixed Bollard

MaxiForce, Removable Bollard

BIKE RACKS

*Custom Steel Tee Bike Rack

Bikeparking.com
'Welle Circular Rack'
(Square tube section)

BENCHES

* Streetlife 'Drift Bench'

Landscape Forms 'Multiplicity'

Landscape Forms 'Bancal'

LITTER + RECYCLING RECEPTACLES

*Forms + Surfaces 'Dispatch'

Landscape Forms 'Austin'

SCULPTURAL BARRIERS

* Streetlife 'Drift Bench'

Custom Stone Block

2.10.4 STREET TREES

TYPICAL CITY POLICIES

As the Better Streets Plan discusses, street trees offer benefits such as traffic calming, shading from heat island effect, reduction of stormwater runoff, ecological habitat, improvement to air quality, enhanced property values and retail activity, creation of a comfortable pedestrian environment, provide a sense of scale, and remind us of natural cycles and changing seasons.

Generally, City Code requires that new development projects must plant a 24-inch box tree for every 20 feet along the property street frontage. Street trees shall not be located in universal passenger loading zones, accessible parking zones and transit stops. The following City Codes apply to the Pier 70 Project Site:

- San Francisco Public Works Code
    - Section 138.1 - Streetscape And Pedestrian Improvements
    - Article 16: Urban Forestry Ordinance
    - Section 806(d) - Required Street Trees for Development Projects
    - SFPW Sidewalk Landscaping Guidelines
- San Francisco Administrative Code - Chapter 98: The Better Streets Policy
- San Francisco Environment Code - Chapter 12: Urban Forestry Council

SPECIAL PROJECT CONSIDERATIONS

Historically, the Pier 70 Area was dominated by industry and consequently characterized by minimal to no vegetation. For this reason, members of The Port, the Planning Department, and a group of historical resource consultants have recommended that trees be used sparingly within the Project Site, particularly in the vicinity of historic resources. Due to the historical requirements and treatment as a Special Use District, the Project will not be in strict compliance with City policy. To strike a compromise between the City policies and historical preservation objectives during the transition to a new neighborhood, street trees have been thoughtfully located in appropriate locations. Where street trees are permitted, the total number of street trees shall be equivalent to an average of one per 35 lineal feet of sidewalk, however they shall be permitted to be spaced irregularly, in clusters, or in regular intervals in order to provide compatibility with the historic district. On sidewalks fronting historical buildings, street trees are not permitted. These areas without street trees may include planters featuring native, low-maintenance, and drought-tolerant low plantings to create the benefit of landscape and greening compatible with the informal and pragmatic historic character of the district. Planters shall be flush with the sidewalk to avoid creating tripping hazards. Tree and planter locations are also dictated by the locations of other site elements, including on-street parallel parking, pole lights, and parking meters.

SPECIES

The selected street tree types are to withstand the particular environmental conditions anticipated on the site including fill soils, serpentine, drainage, salt air, aridity, compaction and utilities. Street tree palette has been compared with and expanded from the approved species list defined by the SFPW and Friends of the Urban Forest specifically for Pier 70 SUD site conditions and its unique character. Street trees within the Project are a mix of leafy evergreen trees as is typical in coastal areas subject to wind and salt air, and deciduous trees for its seasonal character and color contrast. For each street, the trees may be uniform or they may be mixed to emphasize the informal character of the district. Phase 2 and 3 will include a mix of tree species to provide for a diversity of street tree species in the project overall. For complete street tree species list, see Street Tree palette on page 46.

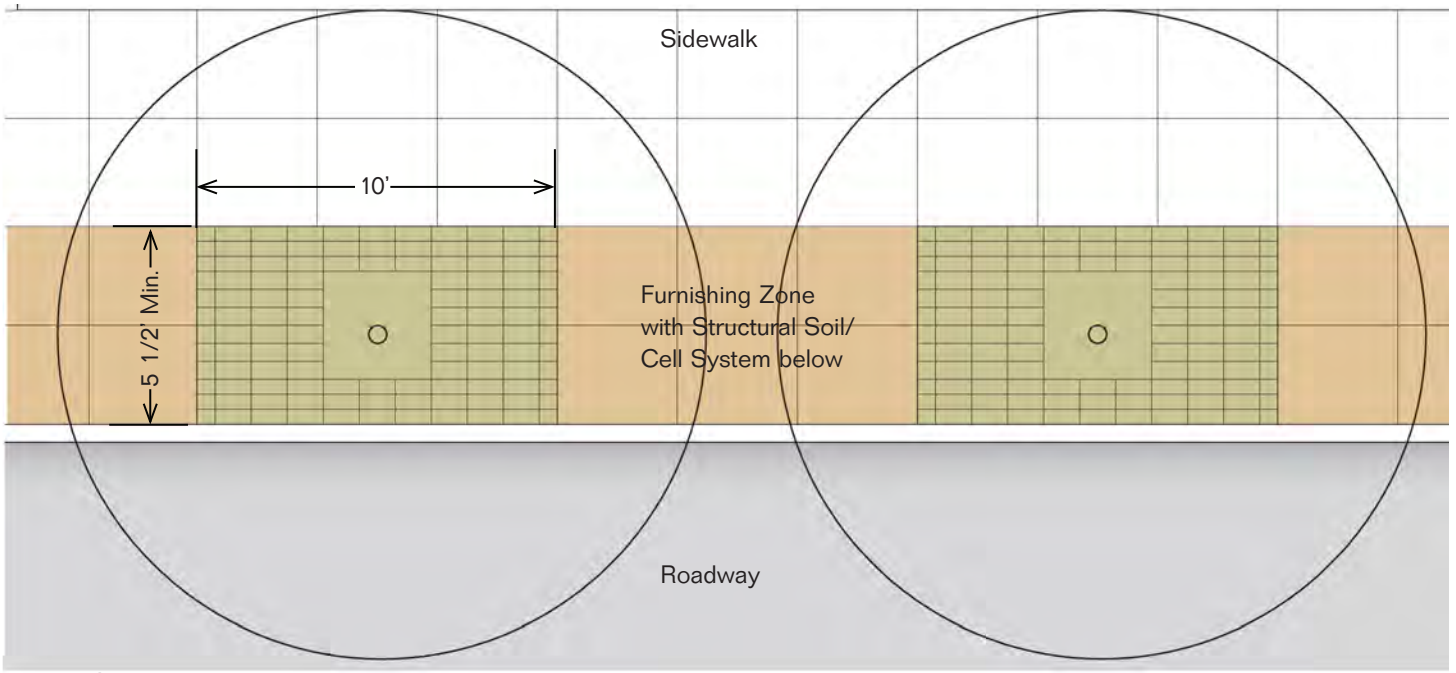
ADDITIONAL REQUIREMENTS

In order to maintain healthy growing conditions, each tree must have at least 500 cubic feet of verified growing medium 3’ deep. This can be achieved in a number of ways including sand based structural soil, structural cells placed under the sidewalk or in continuous trenches in the furnishing zone (see Figure 2.10.2). Refer to and Chapter 3 for street tree location and spacing for each street. Where trees are spaced at 20’ on center, continuous trenches should be utilized to ensure enough soil volume for the healthy growth of street trees.

TREE WELL TYPOLOGIES

Type A - Sand-Based Structural Soil (Preferred)

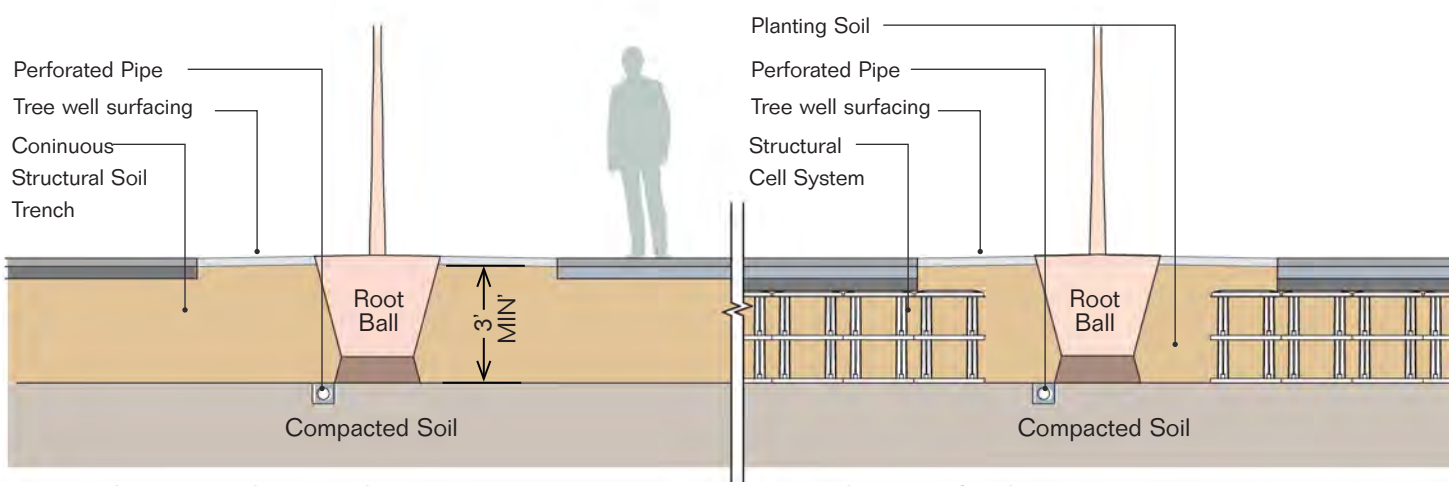
Sand-Based Structural Soil involves blend of soil and sand, which is not "trademarked", consisting of a mix of organic matter and sand which is uniformly graded. This blend provides structural strength and high levels of compaction, while allowing for high aeration, fertility, and good percolation. Where trees are spaced 20' on center, successive tree wells should be connected with a structural soil trench in the furnishing zone.



Typical Street Tree Layout Plan

Type B - Structural Cell System

Structural Cell Systems contain planting soil in manufactured cells capable of supporting adjacent paving, while providing an increased volume of high quality uncompacted planting soil available to tree roots. The use of structural cell systems will require approval by SFPW and SFPUC as part of the review of the future Improvement Plans.



Type A - Sand-Based Structural Soil, typical section

Type B - Structural Cell System, typical section

FIGURE 2.10.2: Tree Well Diagram

PREFERRED SPECIES

DECIDUOUS

Ginkgo | *Ginkgo biloba*
• large

EVERGREEN

Ghost Gum | *Corymbia papuana*
• large

Spotted Gum | *Corymbia maculata*
• large

ALTERNATIVE SPECIES

EVERGREEN

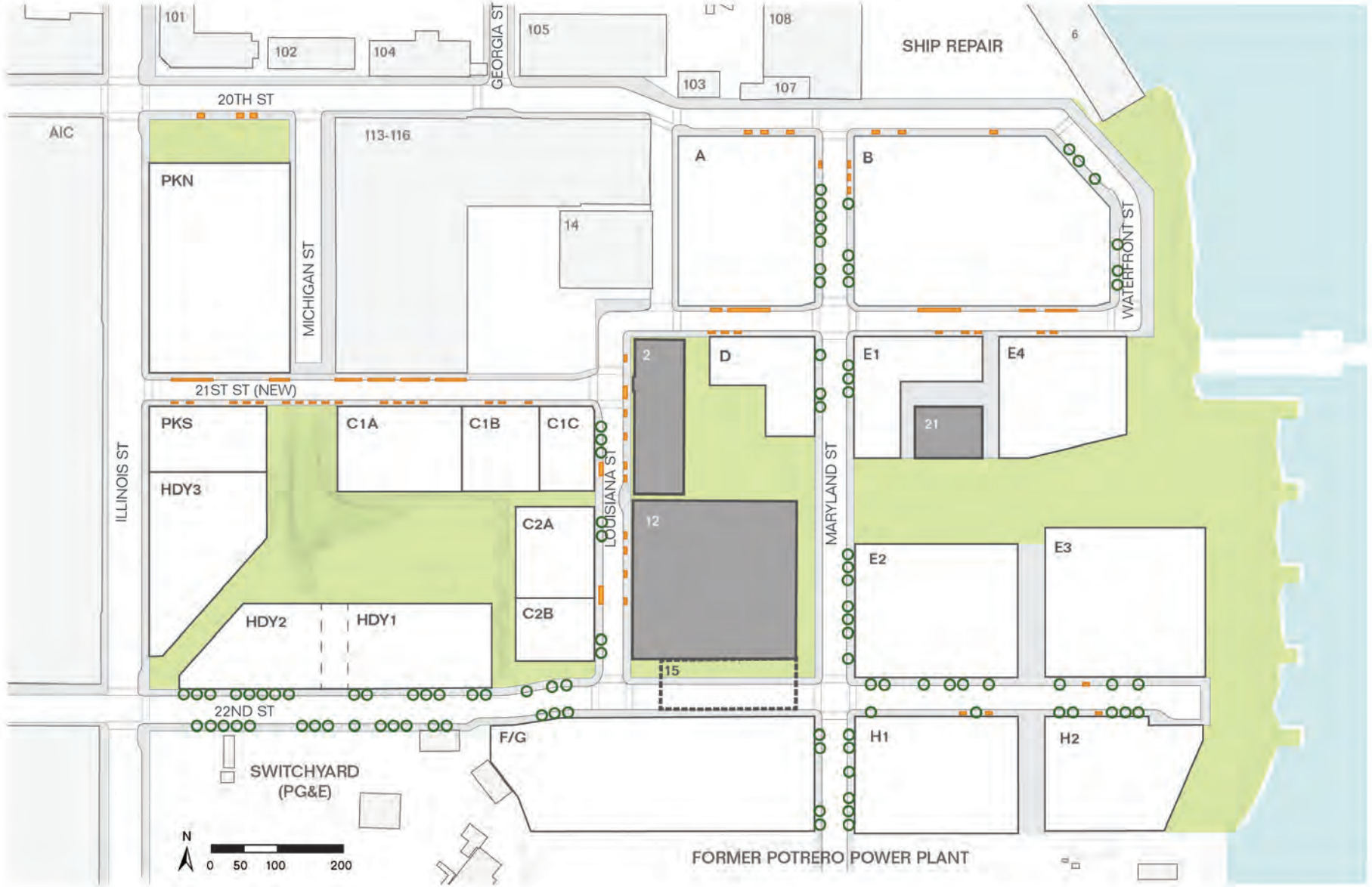
Southern Live Oak | *Quercus virginiana*
• large

Island Oak | *Quercus tomentella*
• large

DECIDUOUS

California Sycamore 'Roberts' | *Platanus racemosa 'Roberts'*
• large

Note:
Additional tree species can be allowed upon approval by the Bureau of Urban Forestry to address availability of trees at the time of construction.



* Locations and quantities of the street trees are subject to change pending final improvement plan design.
** Street trees shall not be located in the universal passenger loading, accessible parking zones and transit stops.
***Plants shall avoid encroaching into pedestrian throughway, curb ramps and crosswalk alignments.

FIGURE 2.10.3: Conceptual Planting Diagram

2.10.5 LOW PLANTING

To allow adequate space for healthy street tree growth, planting strips are to be used throughout the Site. Planting strips are to be designed as an additive feature and are to be in keeping with the character defining features of the Historic District. When selecting species, preference should be given to biodiversity, habitat and pollinator supportive, native, drought-tolerant, and low-maintenance species. The species to the right are preferred, however other species that are similar in character and performance may be permitted. Selected plants shall avoid encroaching into the pedestrian throughway zones, curb ramps and crosswalk alignments.

The project will comply with San Francisco's Water Efficient Irrigation Ordinance, adopted as Chapter 63 of the San Francisco Administrative Code and the SFPUC Rules & Regulations Regarding Water Service to Customers. The project's landscape and irrigation plans shall be reviewed and approved by the SFPUC prior to installation.

PREFERRED SPECIES

Dwarf Pampas Grass
Cortaderia selloana 'Pumila'

Tropic Belle Mat Rush
Lomandra hystrix 'Tropicbelle'

Bull Grass
Muhlenbergia emersleyi

Torch Aloe
Aloe arborescens

Adam's Needle
Yucca filamentosa

Lindheimer's Muhly
Muhlenbergia lindheimeri

Evergreen Eulalia
Miscanthus transmorrisonensis

Amole
Beschorneria yuccoides

Smooth Agave
Agave desmettiana

ALTERNATIVE SPECIES

Blue Flame Agave
Agave 'Blue Flame'

Varigated New Zealand Flax
Phormium tenax 'Variegata'

Rock Purslane
Calandrinia spectabilis

Fortnight Lily
Dietes bicolor

Safari Conebush
Leucadendron 'Red Tulip'

Pier 70
Looking East from Dogpatch to Site

Photo Credit: Shae Rocco / Brookfield

3 STREETSCAPE DESIGN

Given the number of unique conditions on the site, maintaining simplicity and continuity on the streets is essential to providing a unifying framework for development over time. In order to ensure the coherent implementation of the Streetscape Master Plan, this chapter lays out recommended material examples, details, and dimensions, as well as the requirements for parking, emergency vehicles, street lighting, trees, and furniture.

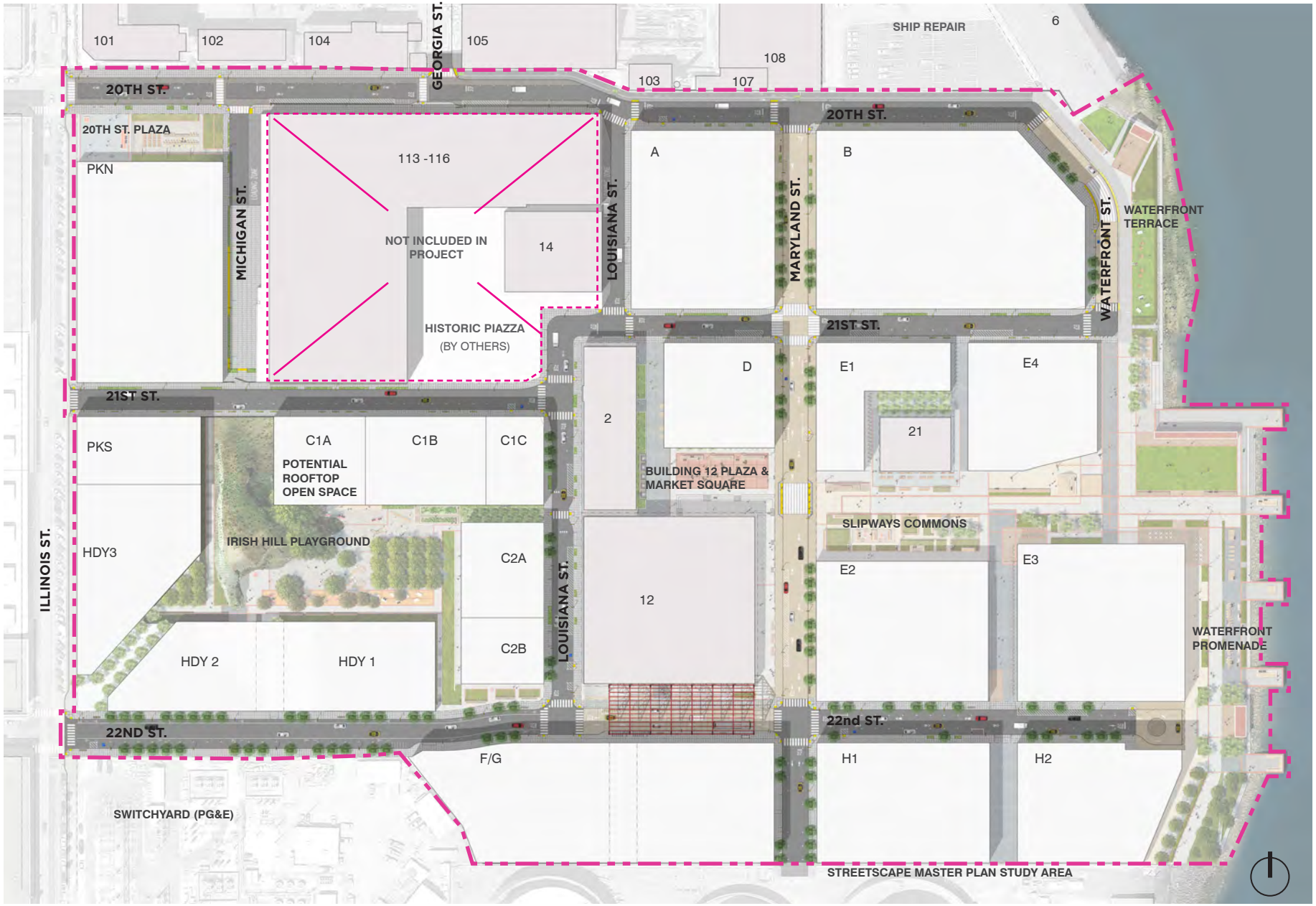


FIGURE 3.1.1: Project Site Streetscape Master Plan

3.1 OVERALL STREETSCAPE MASTER PLAN

3.1.1 OBJECTIVE

The SSMP begins by identifying the determinants of street design that will affect future development and open spaces.

The SSMP establishes design coherence by supporting multi-modal circulation, infrastructure, open space and buildings, while adding authority to previously developed concepts through the identification of specific dimensions, materials, and details, including the following:

- auto, bicycle and pedestrian circulation
- parking
- accessible parking and loading
- ADA parking and Universal Passenger Loading
- curb ramps at narrow sidewalks
- emergency services and loading for buildings
- subsurface utility requirements

The SSMP is a conceptual document that is not intended to provide detailed information for signage, striping, and color curb zones. Signage and striping will be refined as part of the Improvement Plan process. Color curb zones placement shall be submitted to Color Curb Program for review at each building development phase.

3.1.2 CONCEPT

The streetscape design for the Pier 70 Project Site is intended to reflect the Site's unique character. The material examples presented in this chapter are compatible with the Historic Buildings and maritime setting; they are often heavily textured and durable, aging well and gaining character over time.

The design for the streetscapes maintain informal spatial arrangements of trees and furnishings, unlike typical street treatments. The design also allows for change and improvisation by businesses and community.

3.1.3 SITE FURNISHINGS SPACING GUIDELINES

The following are guidelines for the spacing and placement of particular streetscape elements throughout the Site (see Figure 3.1.3: Typical Streetscape Layout Diagram, page 57 for more details).

- **Street Lights:** street lights are laid out conceptually based on a preliminary photometric study. Lights are spaced at 80' on center, staggered on either side of the street, and have 20' tall poles. Lighting levels shall be provided at the lowest levels that are in accordance with either the Illumination Engineering Society of North America (IESNA) lighting guidelines and applicable codes, or the SF Better Streets Guide, whichever specify the lowest levels for a particular area. In later design phases, a lighting consultant will need to perform a more detailed photometric study.
- **Bike Racks:** the project shall provide minimum number of bike parking spaces required by Planning Code Section 155.1-2. The placement of bike racks is in compliance with SFMTA Bicycle Parking: Standards, Guidelines, Recommendations. When demand for bicycle parking is greater than can be accommodated by sidewalk racks, on-street bicycle parking corrals are utilized. Bike racks and areas for bikes that park at bike racks shall be located within the furnishing zone.
- **Benches & Trash/Recycling Receptacles:** these are clustered near intersections and spaced no greater than 250 feet apart. Minimum one in five benches are provided with seat back and armrests.

3.1.4 BAY TRAIL GUIDELINES

The Bay Trail enters the Site on the north side of 20th Street at Georgia Street as a multiuse path, accommodating bicycles and pedestrians. The Bay Trail continues eastward toward the waterfront, then southward through the open space along the shoreline, exiting the Project Site to connect with future development to the south. The following design elements are incorporated into the Bay Trail as it travels through the Project Site:

- a solid white stripe separates pedestrians and bicycles movement.
- a 2' wide buffer zone between existing buildings and bike lane separated by a solid white stripe.
- yield signage and striping with a bar at crossings, where crosswalks intersect, and where appropriate in the park.
- bike lane narrows to 7' from 8' at raised crosswalks to ensure 3' minimum width of truncated domes warning pavers.

3.1.5 INTERSECTION VISIBILITY

Sightline clearance requirements for the placement of trees and planting are based on the following criteria (Refer to 'Street Tree Planting' by SFPW) :

- Landscape material may be planted up to the crosswalk edge on sidewalks and medians provided that it does not exceed 3'-6" in height as measured from the street
- On the approach to any intersection as the traffic flows, trees shall be planted 25' feet from the corner of the property line.
- On the far-side of any intersection as the traffic flows, trees shall be planted no closer than 10 feet from the corner of the property line.
- Trees should have a vertical clearance of 80" in height over the sidewalk measured from the lowest branch, and 14' vertical clearance for any portion of the tree that overhangs the roadway.

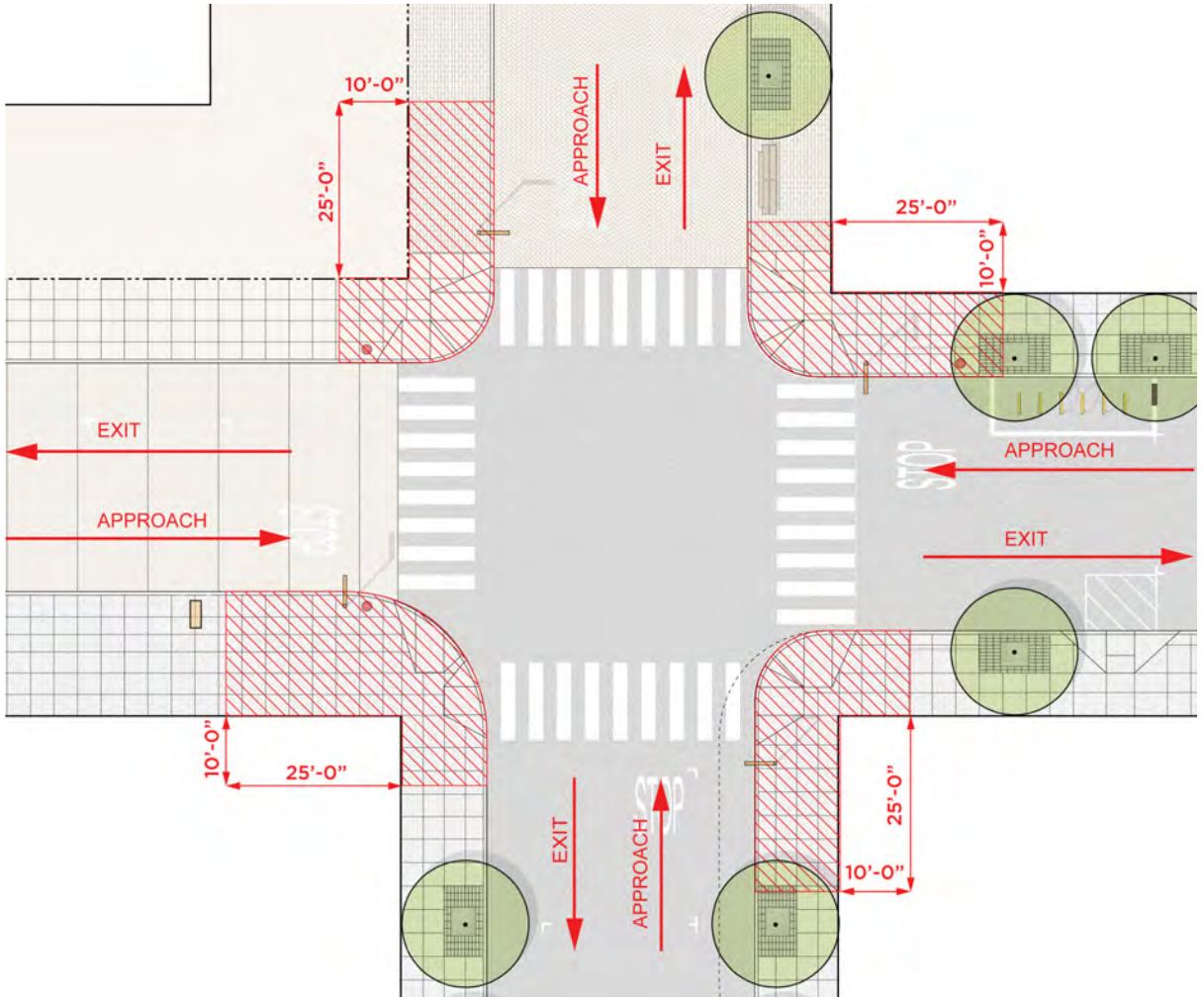


FIGURE 3.1.2: Typical Intersection Sightline Clearance Diagram

3.1.6 TYPICAL STREETSCAPE LAYOUT GUIDELINES

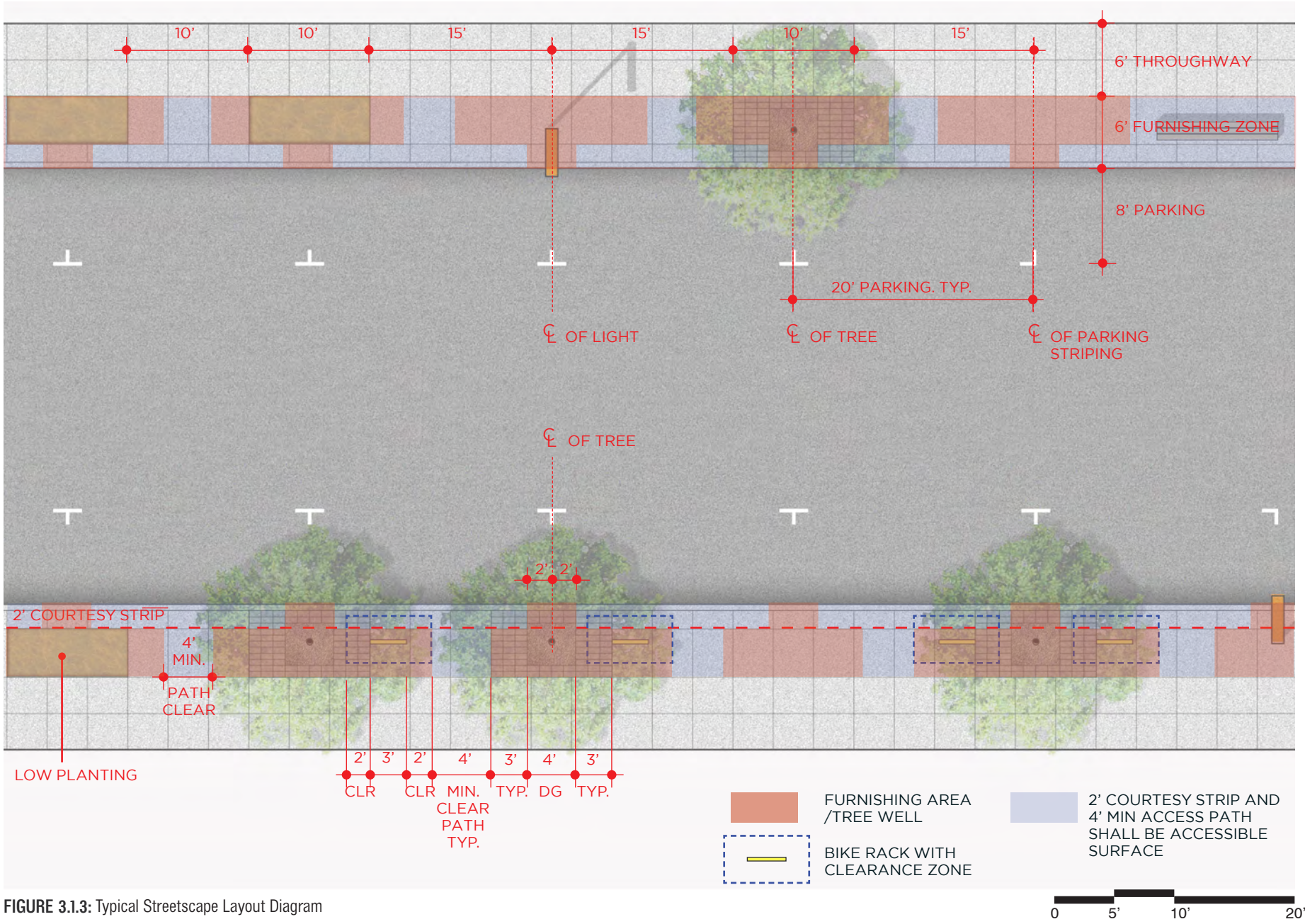


FIGURE 3.1.3: Typical Streetscape Layout Diagram

Existing Building 21

Photo Credit: Shae Rocco / Brookfield

20th Street Looking East

3.2 20TH STREET

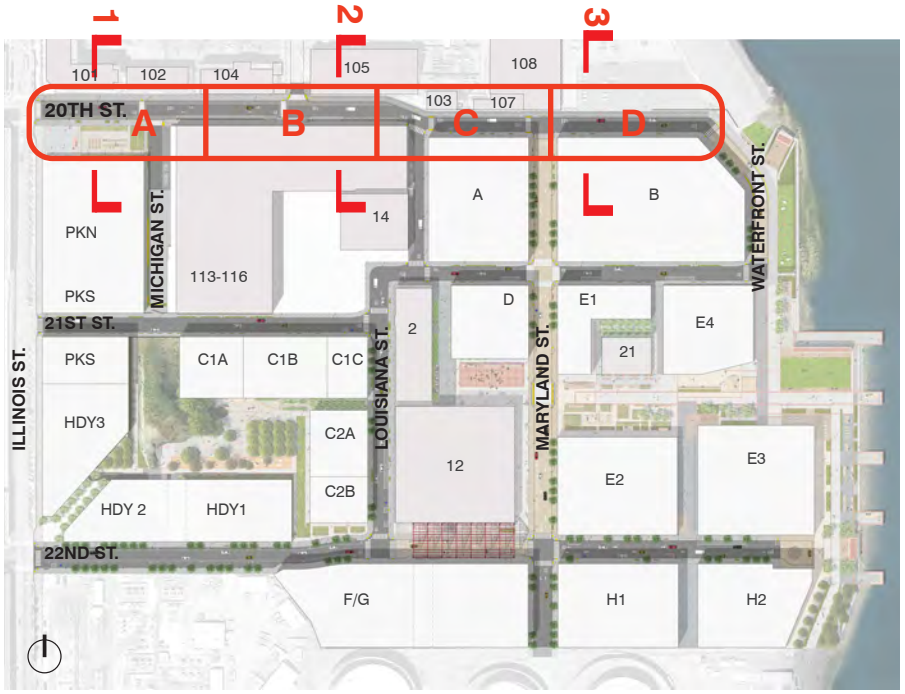
20th Street is a mixed-use street providing a key pedestrian and bicycle connection to the waterfront, while supporting the access needs of local businesses. Running between Illinois Street and the waterfront, 20th Street reflects the historic character of its context while accommodating high levels of pedestrian activity, as well as through traffic and large vehicles between Illinois Street and Louisiana Street. In order to accommodate the location of existing Building 103, 20th Street jogs at Louisiana Street. The Bay Trail enters on the north side of 20th Street at Georgia Street and continues eastward towards the waterfront. Where crosswalks are provided across 20th Street, design measures such as yield signs should be taken to slow down bicycle traffic on the Bay Trail. In order to minimize interruptions of the Bay Trail, North-South crosswalks are placed on just one side of the intersection at Georgia St., Louisiana St., Maryland St., and Waterfront St. A crosswalk is included at Michigan St., which will require a variance because the existing slope exceeds the maximum cross-slope of 2%.

20th Street is a historical street where street trees are not appropriate. In order to maintain the historic industrial character of the Historic Core, no planting shall occur in front of Buildings 101, 102, 104, or 113. Existing cobble stone underlying 20th Street will be restored and reused on the 20th Street roadway between Illinois Street and Louisiana Street.

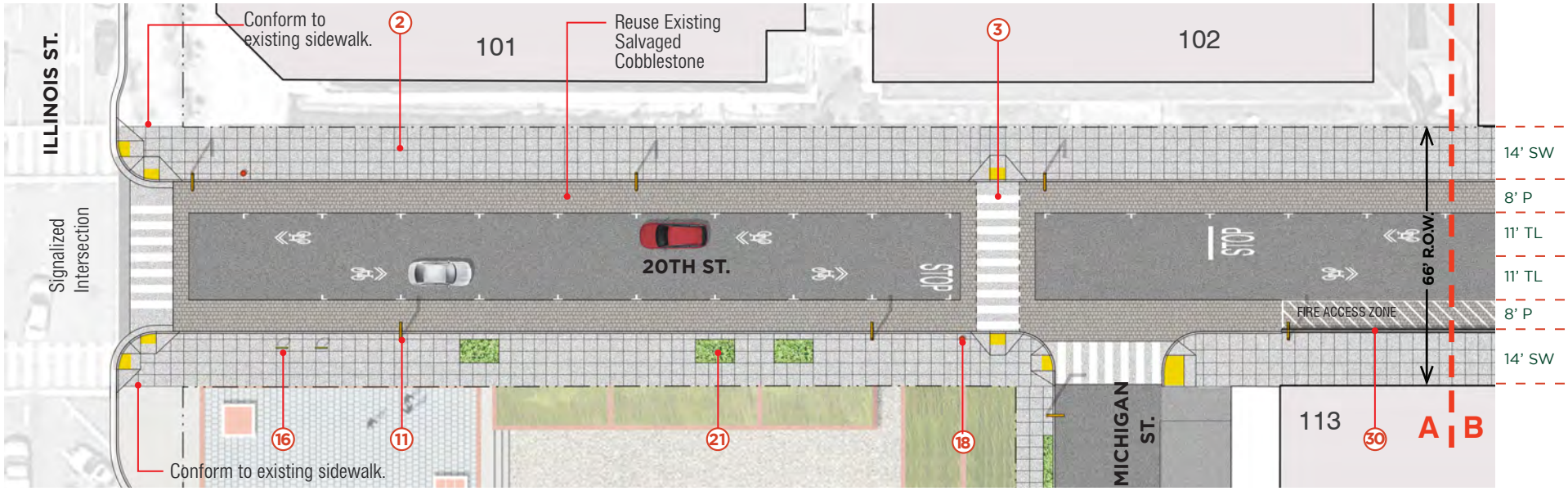
In front of Buildings A and B, long flush planters along the 20th Street sidewalk serve to soften the streetscape and feature a low-maintenance, drought tolerant, native plant palette to appear as additive such that it is distinct of the historic characteristics of the district. The spacing of planters is coordinated with parking and lighting and, overall, has a randomized layout. Driveway curb cut locations shall be placed to minimize disruptions to the locations of lights and planting. On the south side of 20th Street, the edge of the planter is pulled 2-feet away from the face of curb to provide a courtesy strip for passengers disembarking from vehicles.

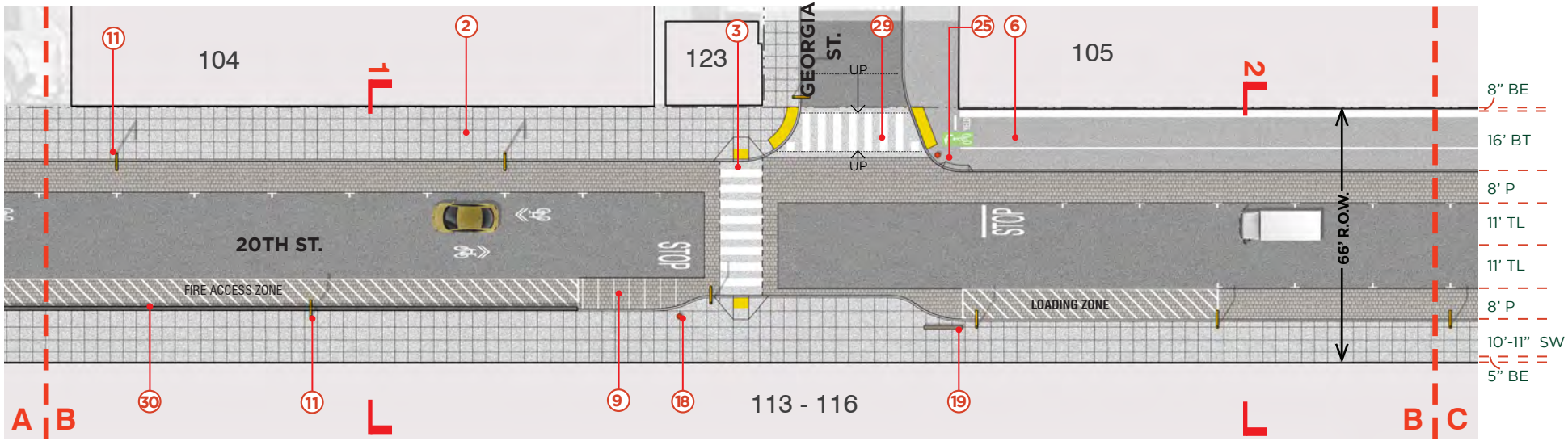
Note: The intersection of 20th Street and Louisiana Street is addressed in the Louisiana Street section (pg. 97). The intersection of 20th Street and Maryland Street is addressed in the Maryland Street section (pg. 89). The transition area between 20th Street and Waterfront Street is addressed in the Waterfront Street Section (pg. 67).

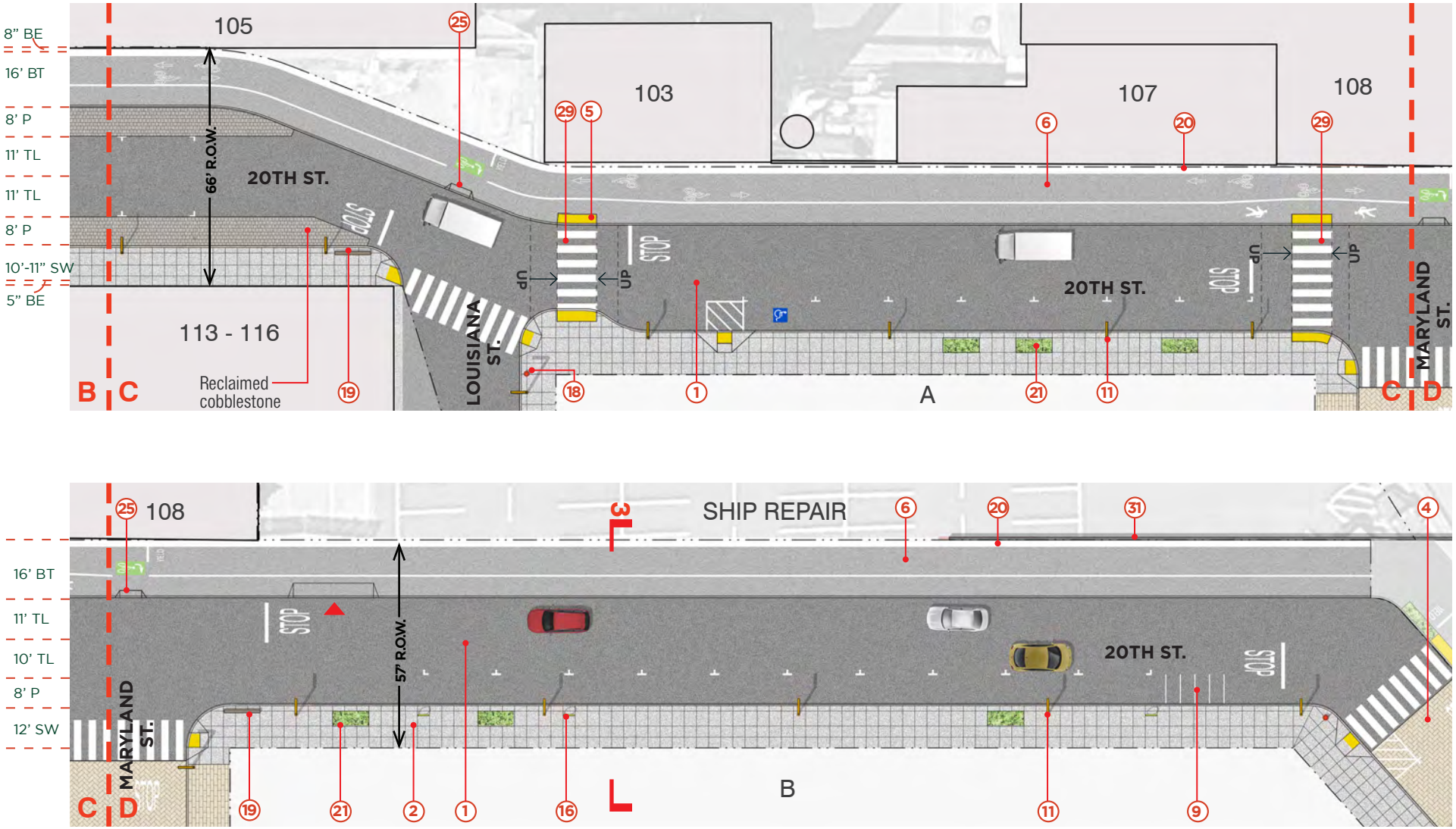
Note: The 16'-8" dimension between Georgia Street and Louisiana Street is intended to allow an 8" encroachment of Building 105, while maintaining the full width for the Bay Trail.



20TH STREET PLAN ENLARGEMENTS







1. Roadway - Asphalt
2. Concrete Sidewalk
3. Concrete Paving - Vehicular
4. Concrete Unit Pavers - Vehicular + Pedestrian
5. Warning Paver
6. Bay Trail
9. Motorcycle Parking
11. Pole Light
16. Bike Rack / corral
18. Litter + Recycling Receptacle
19. Barrier
20. 2' Bay Trail Buffer Zone
21. Low Planting
25. Curb Cut for Bicycles
29. Raised Crosswalk
30. Existing Retaining Wall & Railing - No Access
31. Retaining Wall Outside of R.O.W.
▲ Driveway Curb Cut

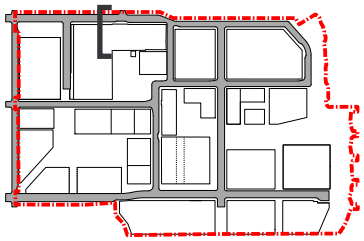
BE- building encroachment
BT- bay trail
P - parking
SW - sidewalk
TL - travel lane

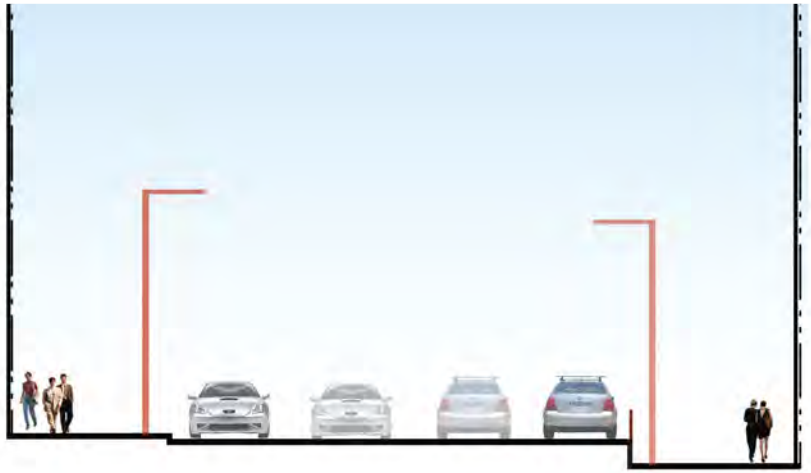
0 20' 40' 80'

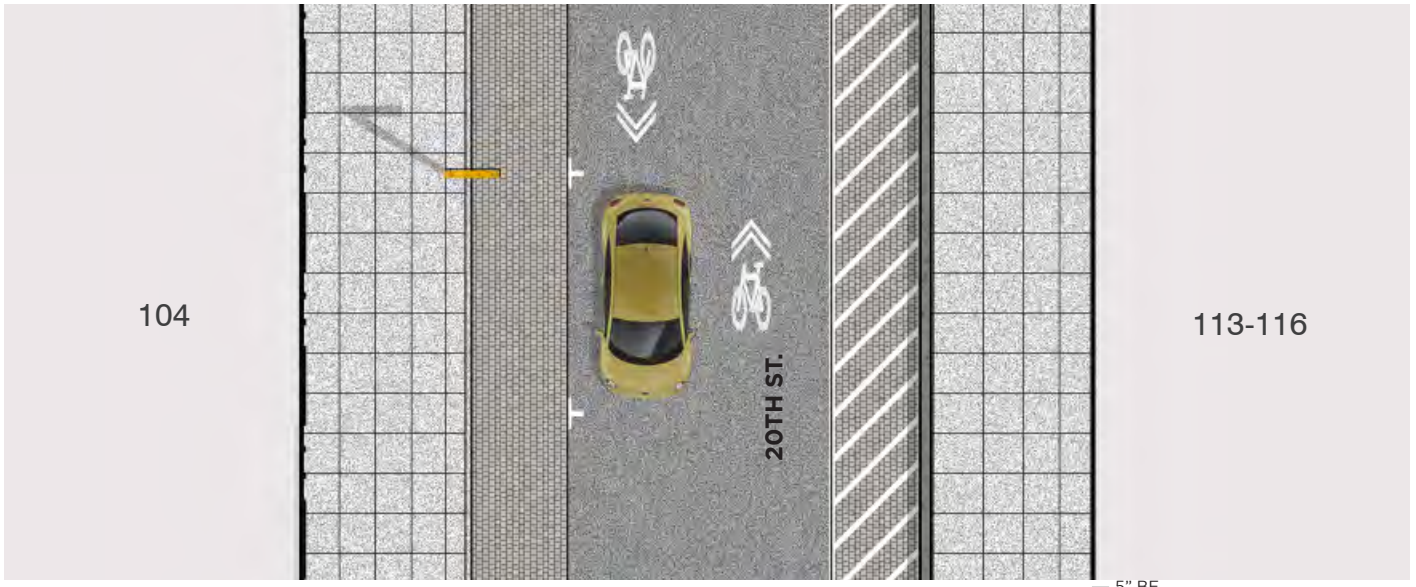
Note:

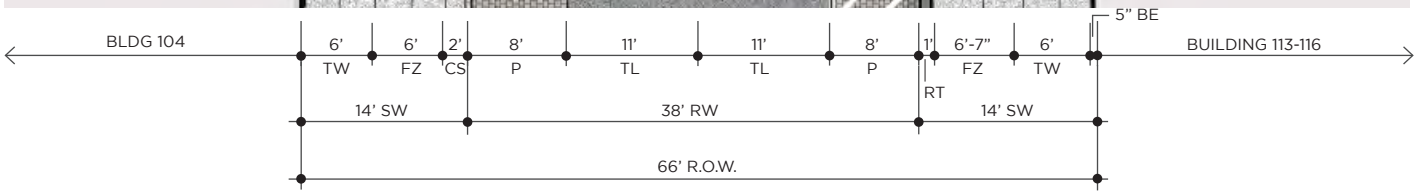
1. Refer to Master Material Palette on page 108 for more specific information on materials and products.
2. All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

20TH STREET SECTION - 1



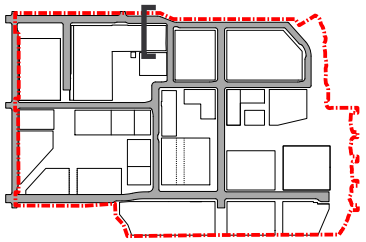


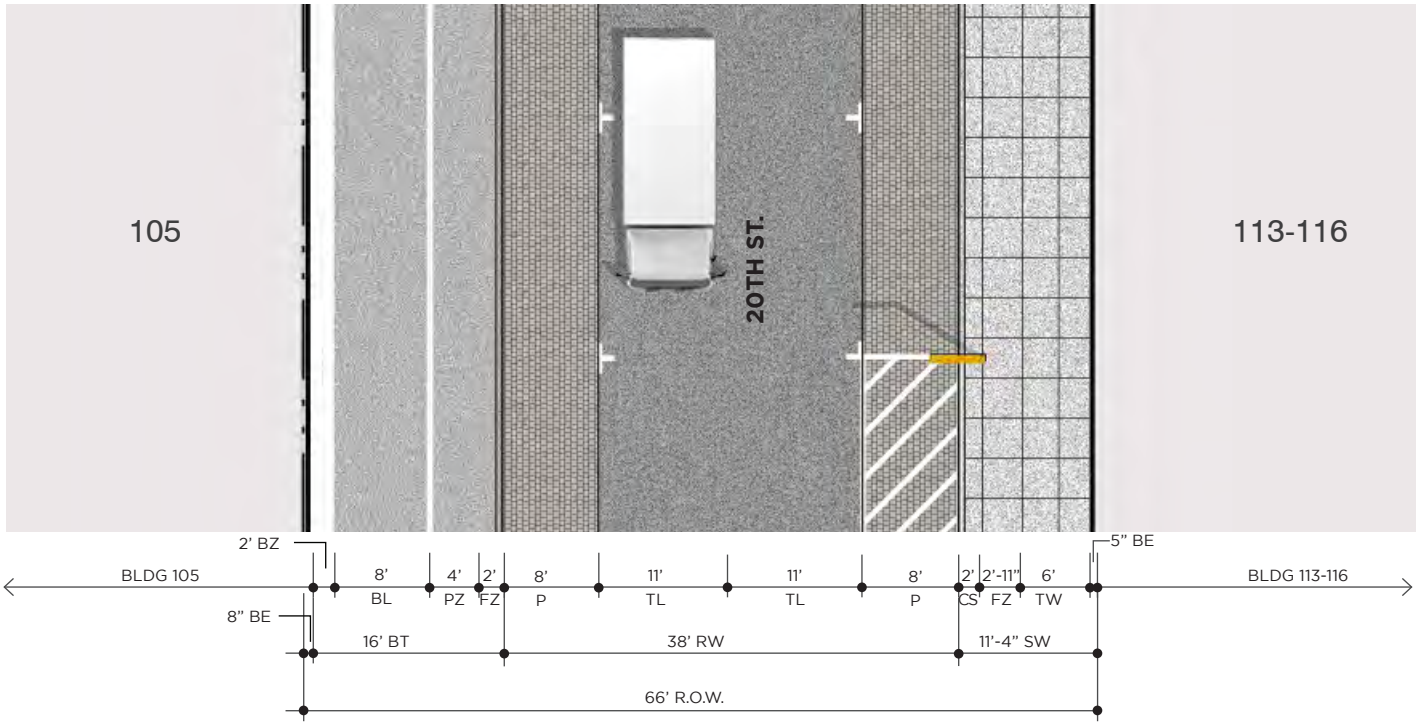




BE - building encroachment
BLDG - building
CS - courtesy strip
FZ - furnishing zone
P - parking
R.O.W. - right of way
RT - retaining wall
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

20TH STREET SECTION - 2

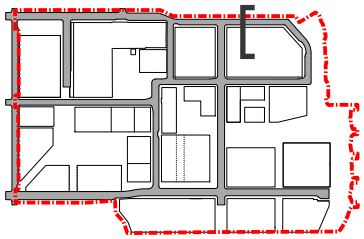


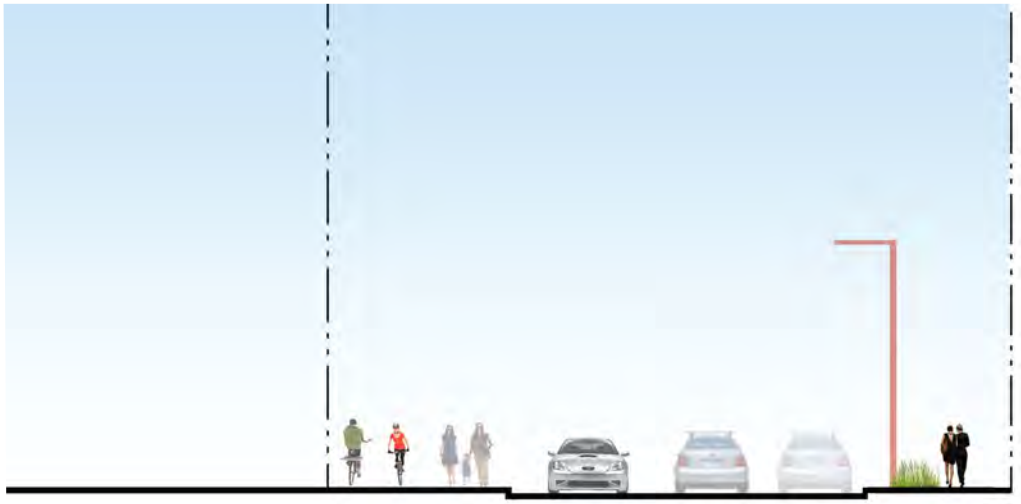


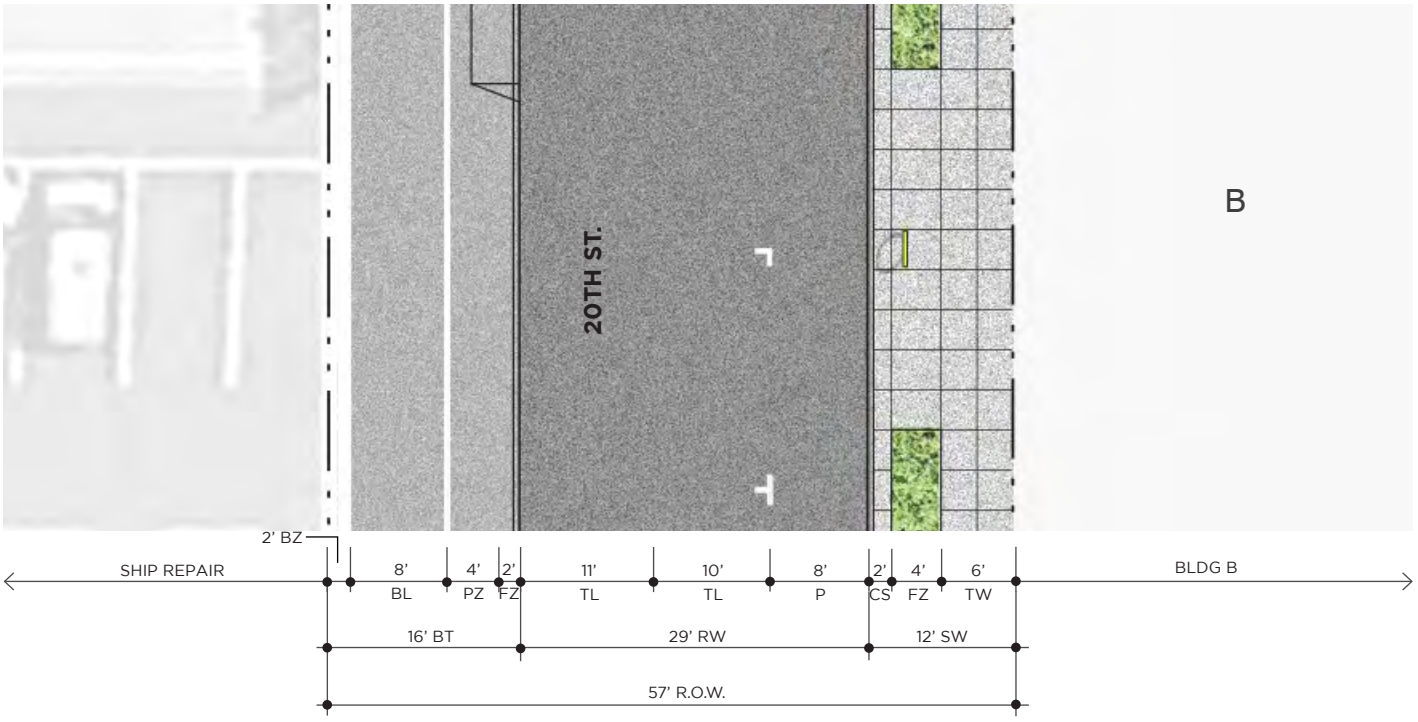
BE- building encroachment
BL- bike lane
BLDG - building
BT - bay trail
BZ- buffer zone
CS - courtesy strip
FZ - furnishing zone
P - parking
PZ - pedestrian zone
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

20TH STREET SECTION - 3







BL- bike lane
BZ - buffer zone
BLDG - building
BT - bay trail
CS - courtesy strip
FZ - furnishing zone
MUP - multi-use path
P - parking
PZ - pedestrian zone
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

ENLARGEMENT - RAISED CROSSWALK

Image Credit: Better Streets Plan

Precedent Image: 5th Street & Tehama Street, San Francisco

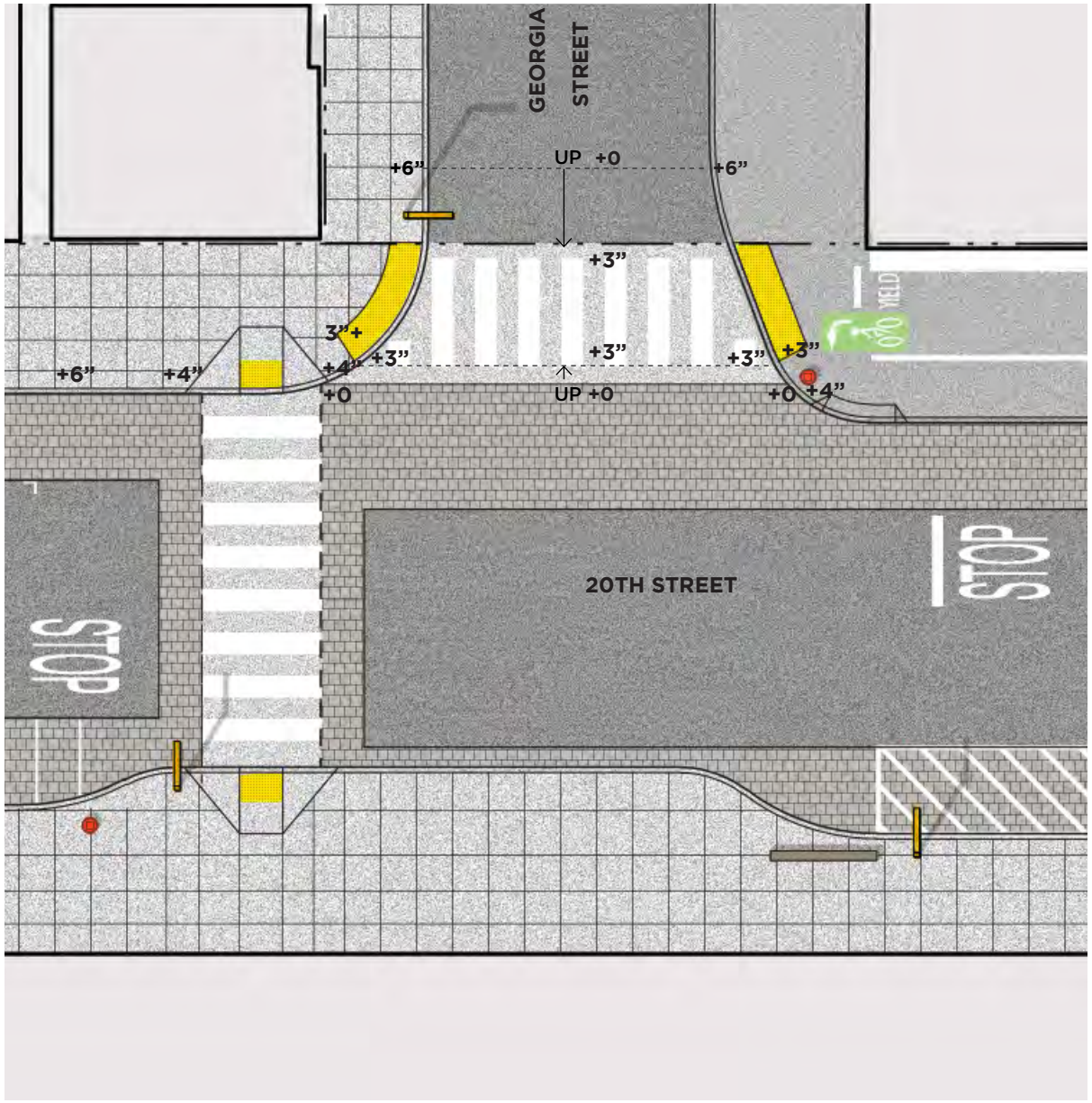


FIGURE 3.2.1: Raised Crosswalk at Georgia St. & 20th St Enlargement Plan

View from existing Building 2 toward future location of Waterfront St.

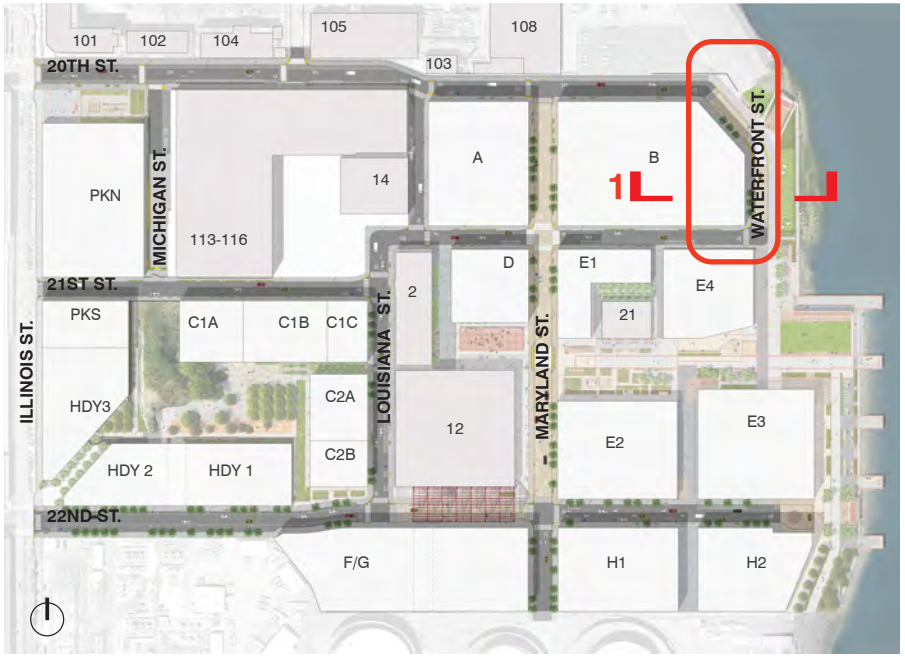
3.3 WATERFRONT STREET

Waterfront Street is a park edge street that is designed to accommodate high levels of pedestrian and bicycle activity and connects the Bay Trail to the site shoreline. This street provides vehicular drop-off and parking along the west side of the street, while encouraging low vehicular speeds through design measures, including the use of special paving, and signage. The Bay Trail fronting Waterfront Street is part of the open space and not the public ROW, and therefore has a different configuration than the Bay Trail on 20th Street.

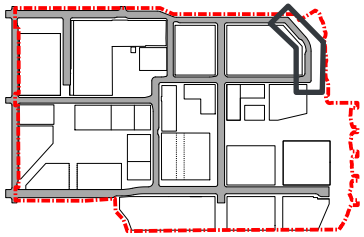
This is a street featuring unit pavers in the roadway as traffic calming measures to alert vehicles to slow down as they enter the segment of Waterfront Street. A special paving pattern across the mid-block is designed to accentuate the 'Street-to-Waterfront' connection, as well as to introduce an additional traffic calming measure. Additionally, a mid-block bulb-out on the western side of the street is added to maintain generous sidewalk width and provide optimal lines of sight for crossing. Bollard lights at 6 feet on center run along both sides of the mid-block crossing emphasizing the connection to the waterfront open space. These bollards, as well as other fixed objects - including warning pavers, pole lights, trees, low planting, and site amenities in the furniture zone - delineate the different areas for pedestrian and vehicular circulation. Crosswalks are provided at the northern and southern ends of Waterfront Street.

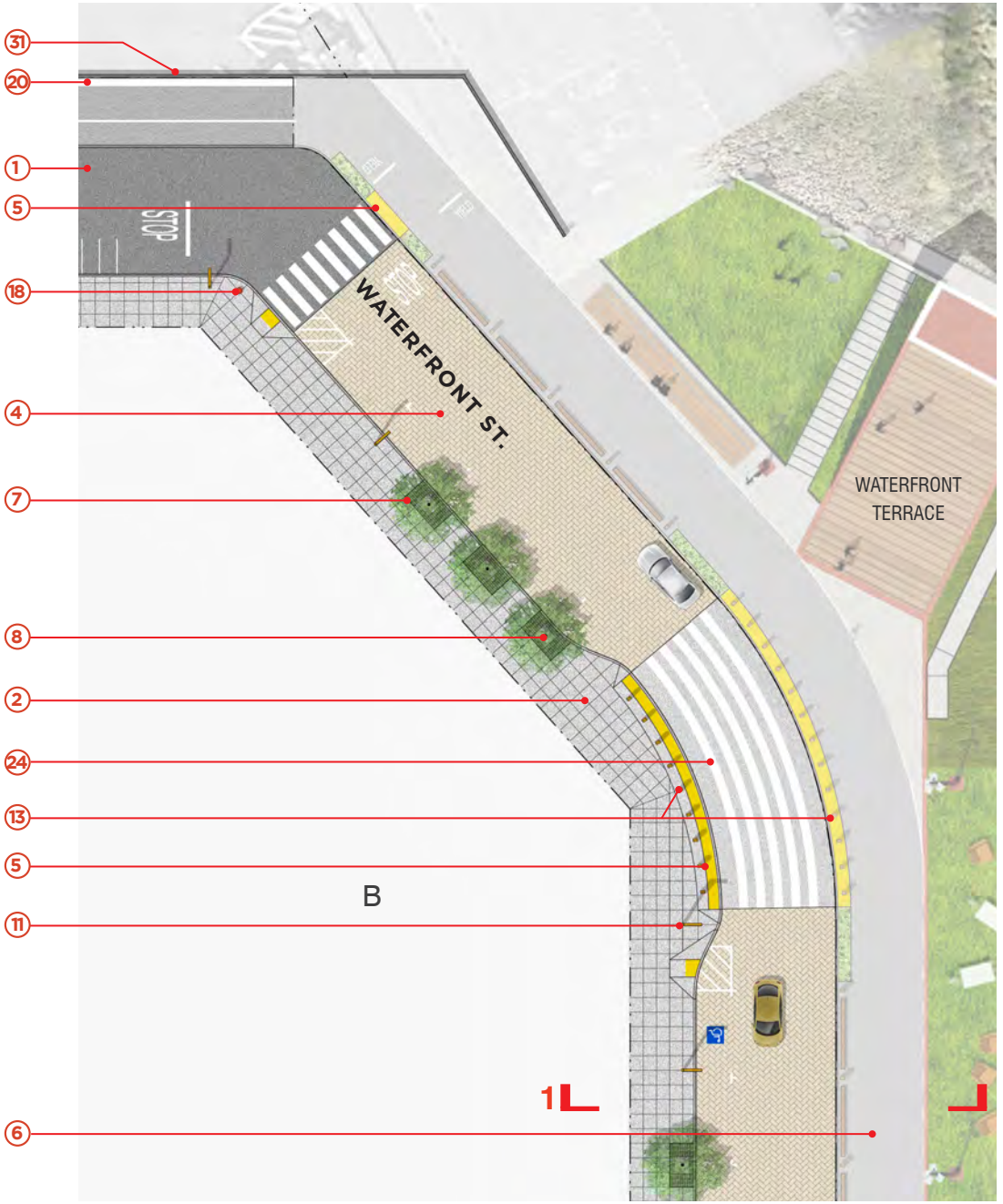
Trees and low planting should be provided along the western edge of Waterfront Street in 10-foot modules. They are spaced in relation to parking and lighting, allowing for a minimum 4-foot-wide access path from parking stalls, while leaving room for the intermittent placement of trash receptacles, bike racks and other vertical elements. See typical parking/tree/site amenity layout diagram (Figure 3.1.3: Typical Streetscape Layout Diagram, page 55).

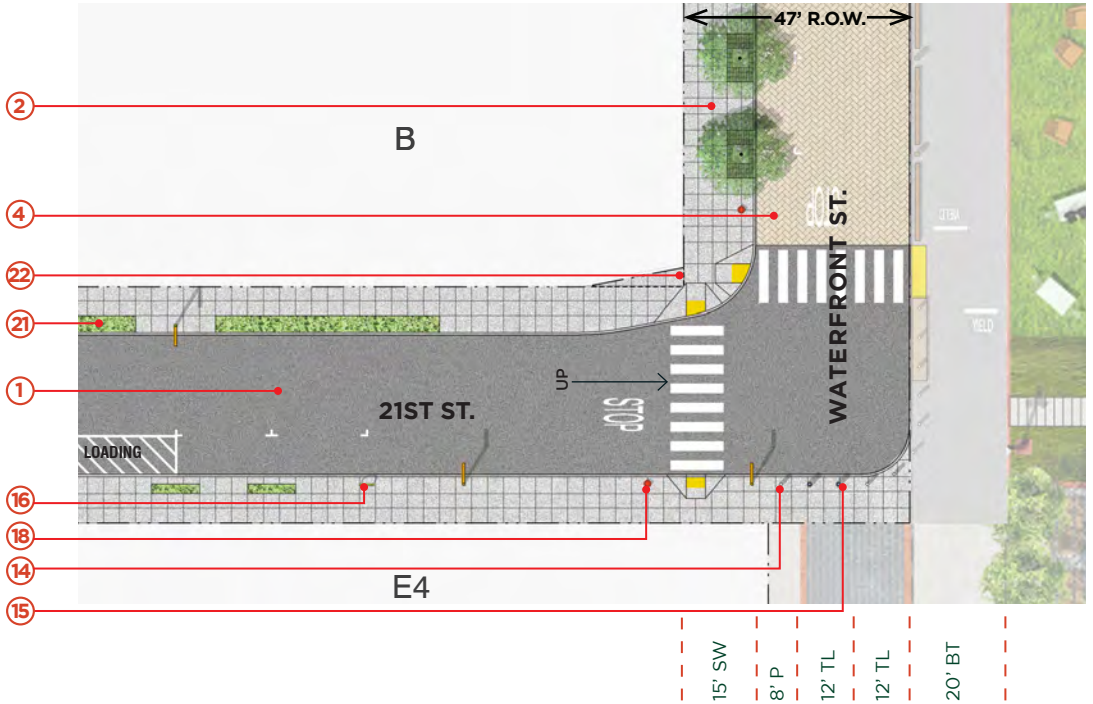
The intersections at Waterfront Street are stop sign-controlled.



WATERFRONT STREET PLAN ENLARGEMENT







1 Roadway - Asphalt
2 Concrete Sidewalk
4 Concrete Unit Pavers - Vehicular + Pedestrian
5 Warning Pavers
6 Bay Trail
7 Tree Well Surfacing
8 Tree Well with Opening at Trunk
11 Street Light With Pull Box
13 Bollard Light
14 Fixed Bollard
15 Removable Bollard
16 Bike Rack
18 Litter + Recycling Receptacle
20 2' Bay Trail Buffer Zone
21 Low Planting
22 Building Overhang
24 Special Treatment for Pedestrian Crosswalk
31 Retaining Wall Outside of R.O.W.

0 20' 40' 80'

BT - bay trail
P - parking
SW - sidewalk
TL - travel lane

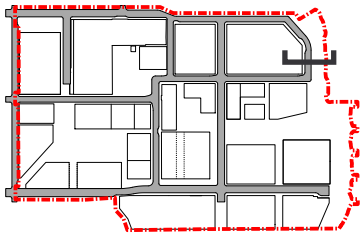
Note

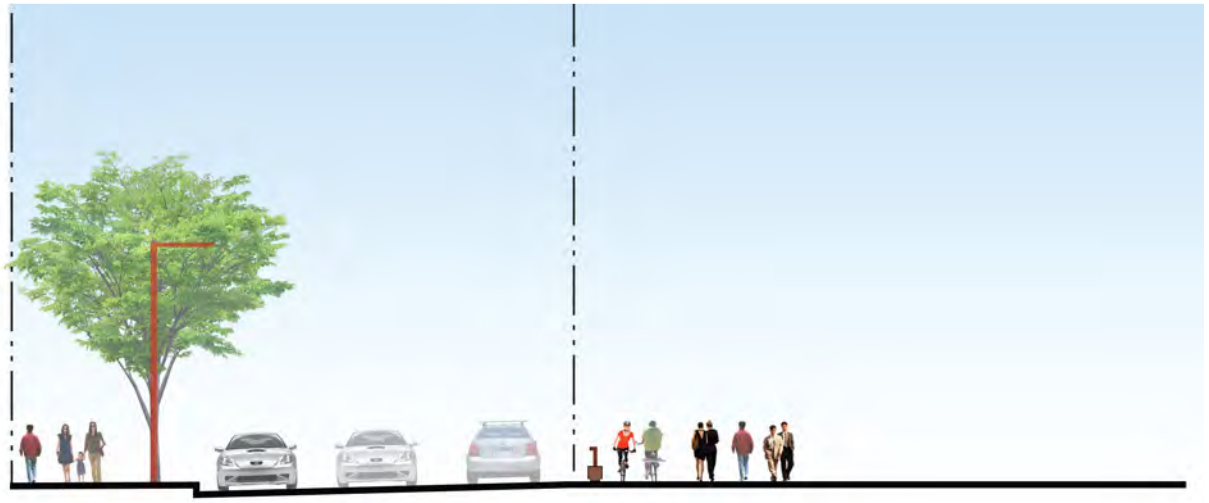
1: Refer to Master Material Palette on page 108 for more specific information on materials and products.

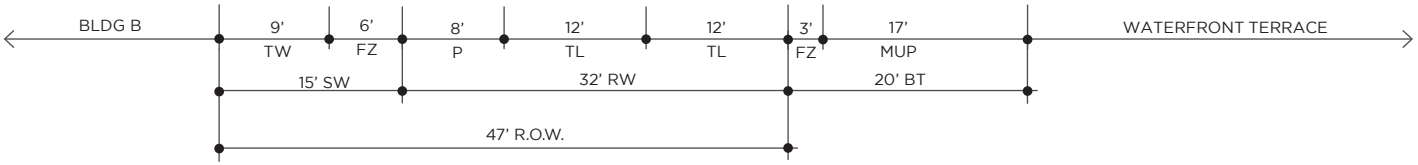
2: All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

3: The final design of the special treatment at crosswalks, as well as the exact size and other details, will be determined as part of the improvement plan development and approvals.

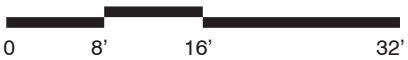
WATERFRONT STREET SECTION - 1







BLDG - building
FZ - furnishing zone
MUP - multi-use path
P - parking
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway
WP warning pavers



Overlooking existing Building 12 toward future location of Waterfront Street

Photo Credit: Shea Rocco / Brookfield

Existing Building 21

3.4 21ST STREET

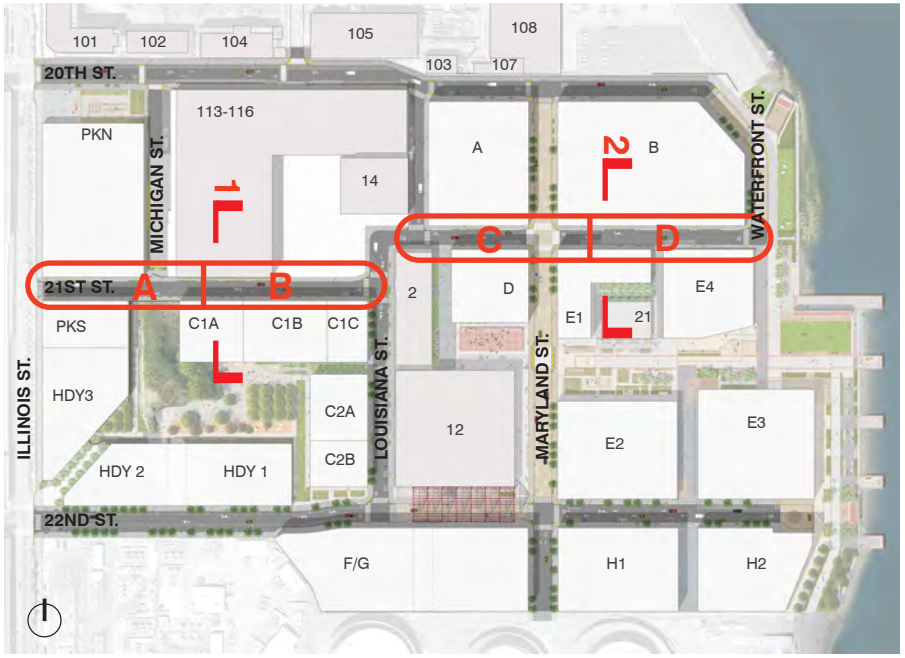
21st Street runs east-west between Illinois Street and the waterfront, with a jog at Louisiana Street to accommodate the existing location of Historic Building 2. As an alley, 21st Street accommodates access needs for commercial uses, as well as vehicular and pedestrian circulation. The western portion of the street located between Illinois Street and Louisiana Street provides service access to the district parking structure.

The portion of 21st Street just east of Illinois Street has a relatively steep slope, as it crosses the northern edge of the remnant of Irish Hill. As 21st Street crosses the Irish Hill remnant, a retaining wall along the southern edge of the 21st Street right-of-way retains the existing landform. A portion of the sidewalk on 21st Street is slightly higher than the finished floor elevation of existing Building 116. A retaining wall under the sidewalk, running parallel to Building 116 and as close to the building face as possible, should be constructed to retain this portion of the sidewalk. An ADA-accessible cover should be provided as part of the sidewalk to span the void space between the retaining wall and the building face (Please see page 75 for detail). A retaining wall at the southern end of Michigan Street is proposed to resolve the elevation difference between Michigan Street and the 21st Street sidewalk. A minimum 4' opening between retaining walls where grades of the two intersecting streets match will allow pedestrian access between Michigan Street and 21st Street (Please see page 106 for detail).

No trees are permitted along 21st Street, due to the historic character and narrow width of the street. Low planting should be provided along 21st Street. In areas with parallel parking, low planting are provided in 10-foot modules. They are spaced in relation to parking and lighting, allowing for a minimum 4-foot-wide access path from parking stalls, while leaving room for the intermittent placement of trash receptacles and bike racks (see Figure 3.1.3: Typical Streetscape Layout Diagram, page 55 for more details).

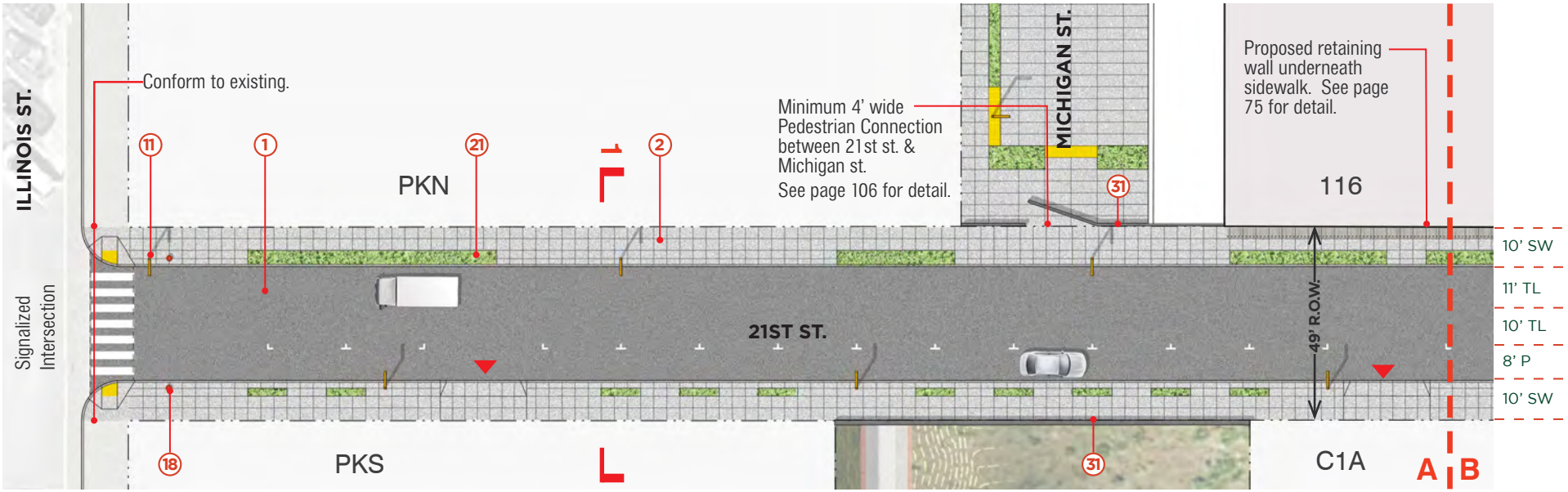
In areas with no on-street parking, low planting are provided in a continuous strip with breaks at pole lights and in front of the piazza. The planting palette shall feature drought tolerant, low-maintenance species that reflect the historic character of the district.

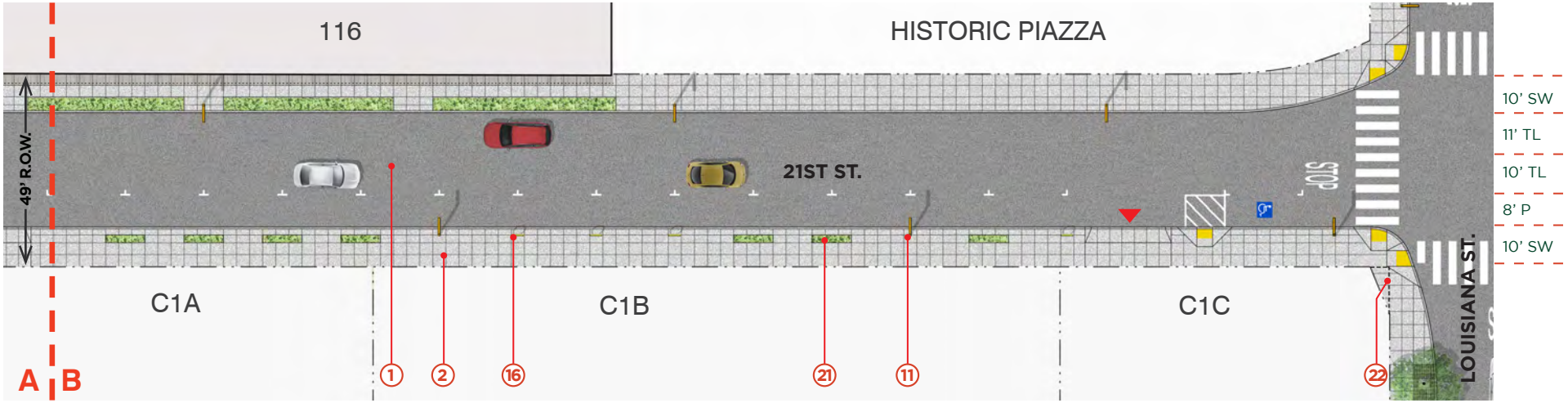
As an exception to the typical conditions across the Site, 21st Street has narrower 10-foot-wide sidewalks, with a minimum 4-foot throughway at the backs of curb ramps. Due to the narrower right-of-way of 21st Street, lighting is spaced further apart at 120 feet on center.

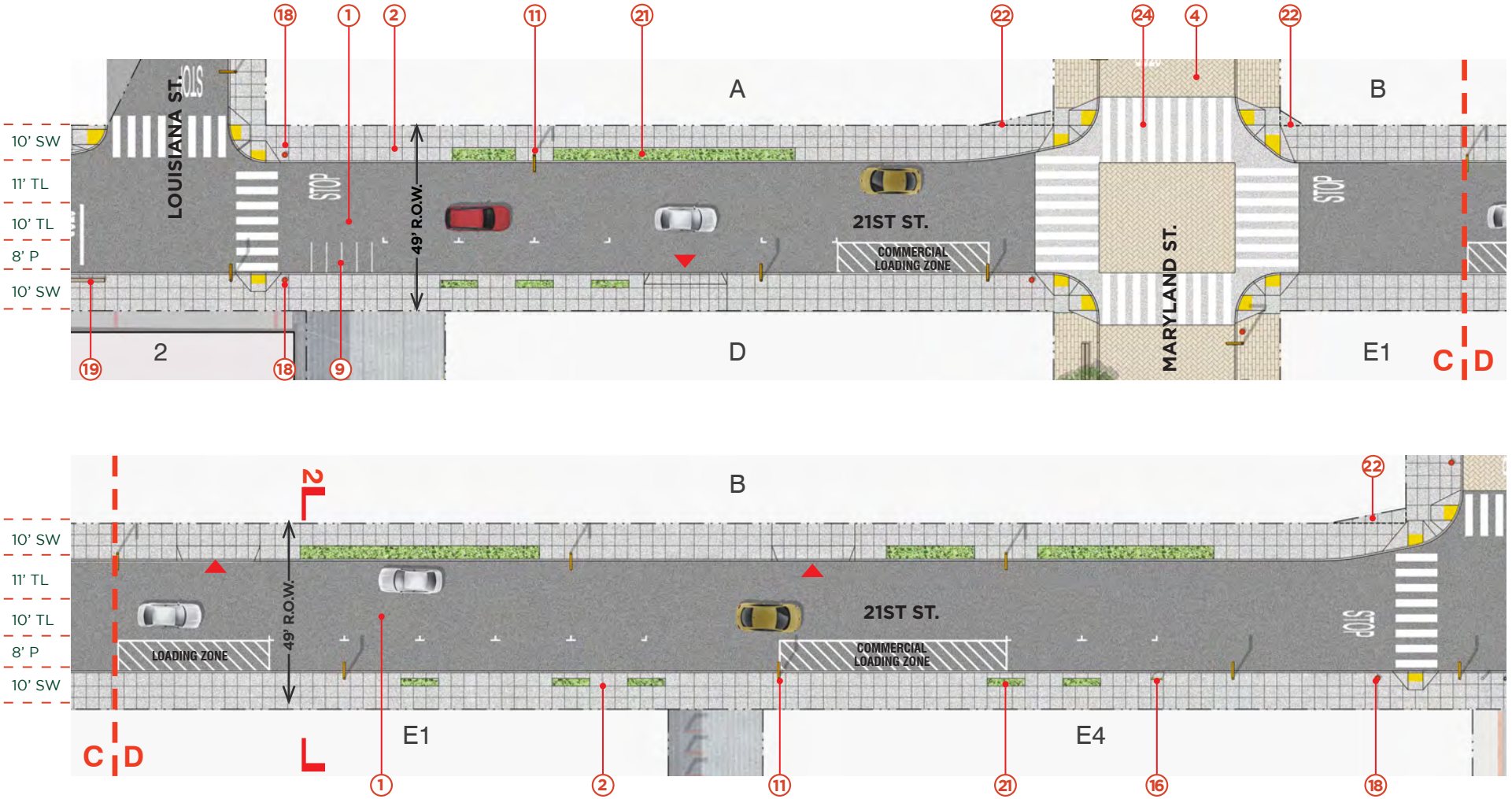


Note: The intersection of 21st Street and Maryland Street is addressed in the Maryland Street section (pg. 90). The intersection of 21st Street and Louisiana Street is addressed in the Louisiana Street section (pg. 98), and the intersection of 21st Street and Waterfront Street is addressed in the Waterfront Street section (pg. 68).

21ST STREET PLAN ENLARGEMENTS







1 Roadway - Asphalt
2 Concrete Sidewalk
4 Concrete Unit Pavers - Vehicular + Pedestrian
9 Motorcycle Parking
11 Street Light
16 Bike Rack
18 Litter + Recycling Receptacle
19 Sculptural Barrier
21 Low Planting
22 Building Overhang
24 Special Treatment for Pedestrian Crosswalk
31 Retaining Wall Outside of R.O.W.

▲ Driveway Curb Cut

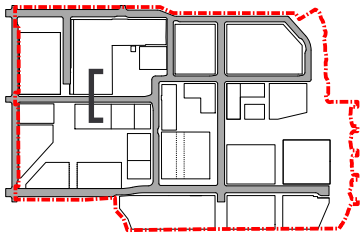
P - parking
SW - sidewalk
TL - travel lane

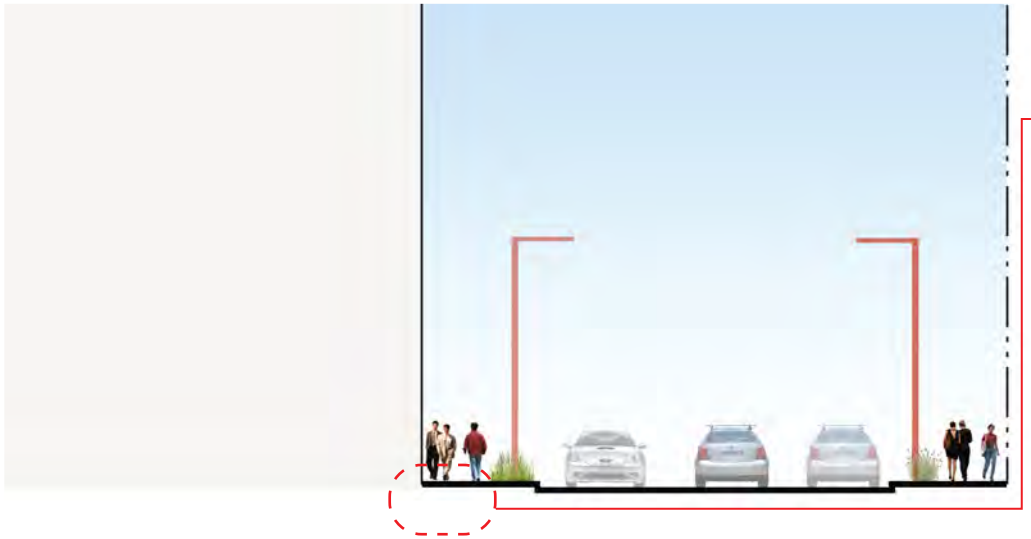
0 20' 40' 80'

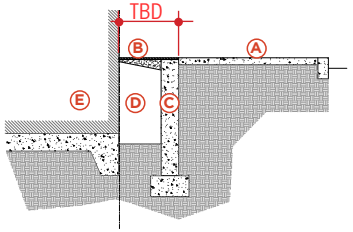
Note:

1. Refer to Master Material Palette on page 108 for more specific information on materials and products.
2. All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.
3. The final design of the special treatment at crosswalks, as well as the exact size and other details, will be determined as part of the improvement plan development and approvals.

21ST STREET SECTION - 1

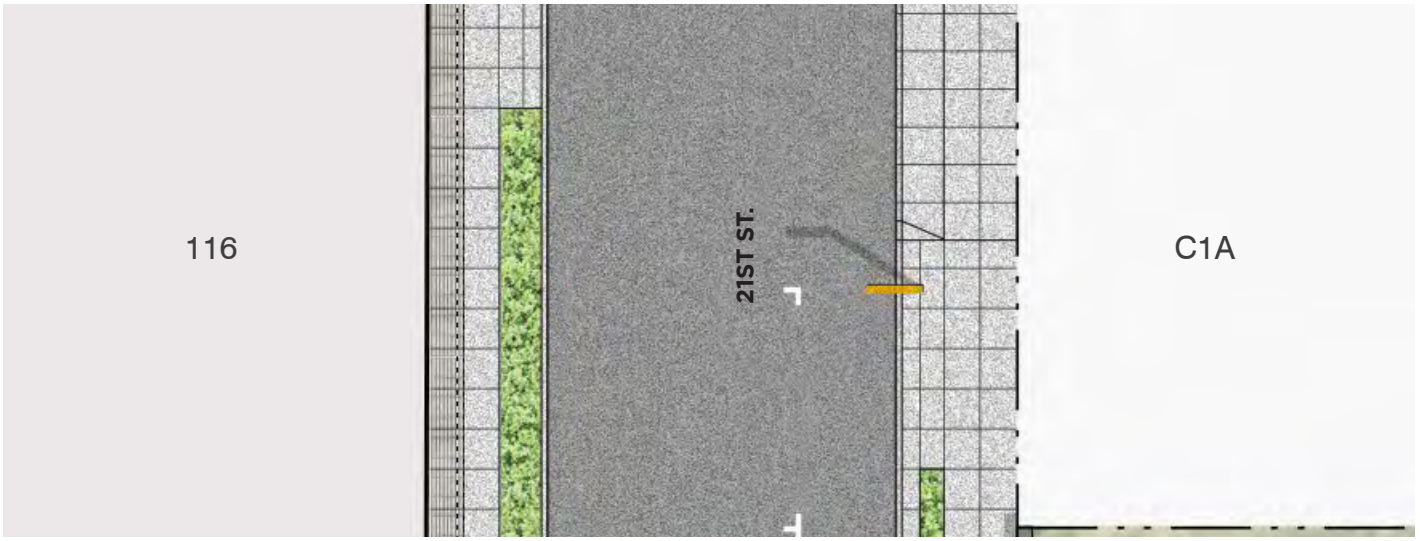


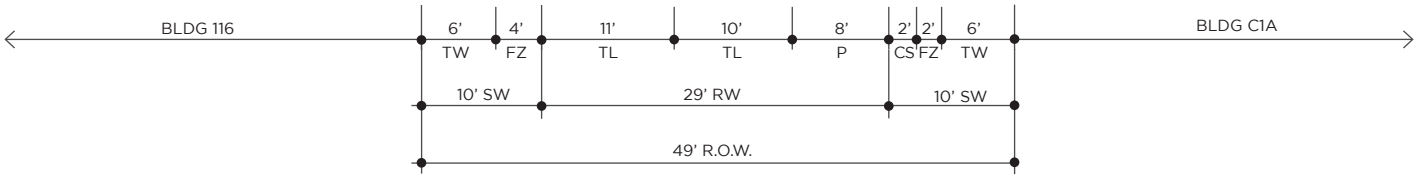




Ⓐ Concrete Sidewalk
Ⓑ Accessible Cover
Ⓒ Concrete Retaining Wall
Ⓓ Air Gap between Building 116 & Sidewalk
Ⓔ Orton Building 116 - existing FFE approx. +13.1'

Retaining Wall Detail at BLDG 116

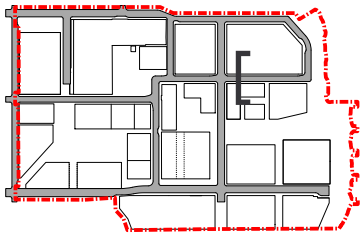


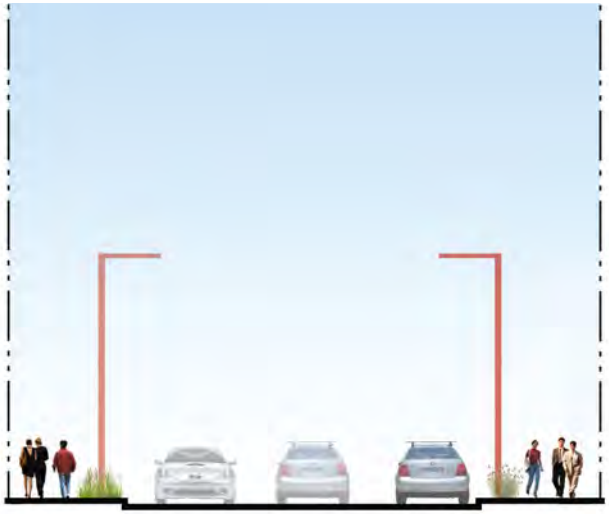


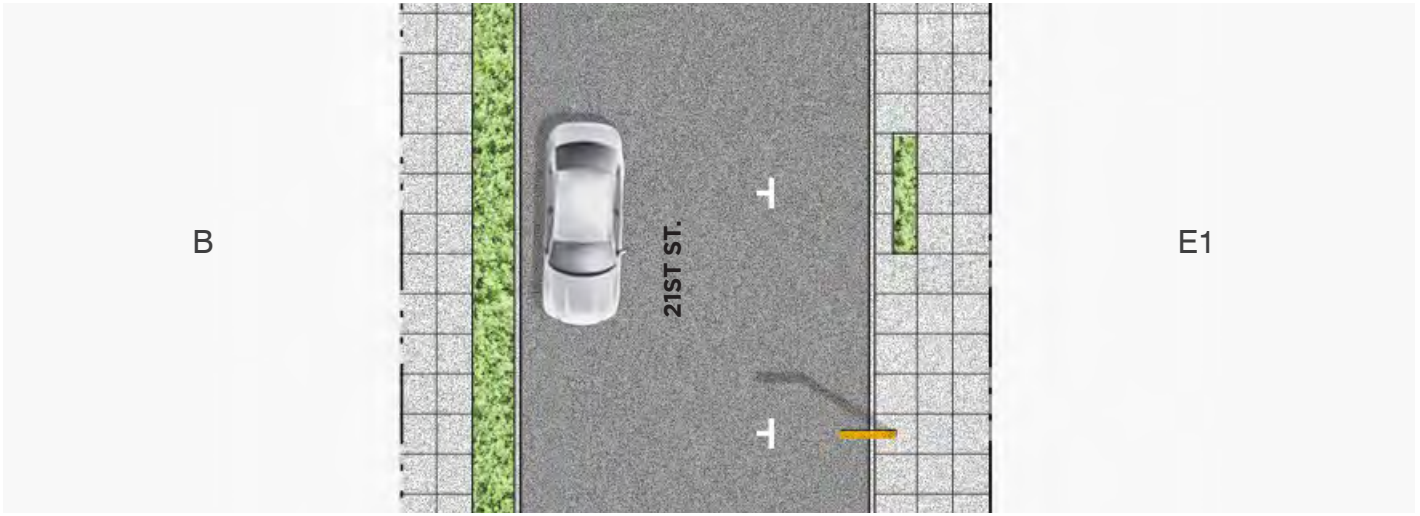
BLDG - building
CS - courtesy strip
FZ - furnishing zone
P - parking
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

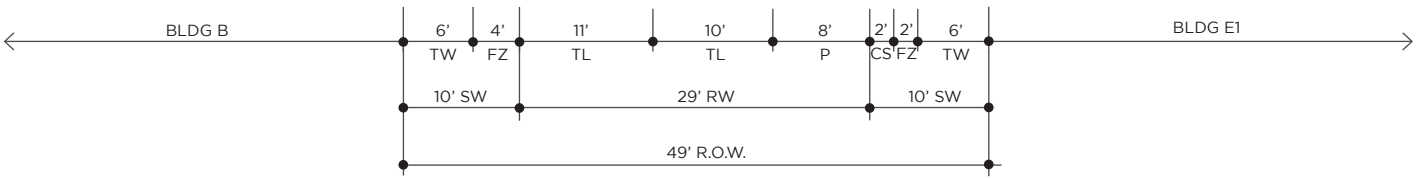
0 8' 16' 32'

21ST STREET SECTION - 2









BLDG - building
FZ - furnishing zone
P - parking
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

Photo Credit: Design Distill / Brookfield

22nd Street Looking East Rendering

3.5 22ND STREET

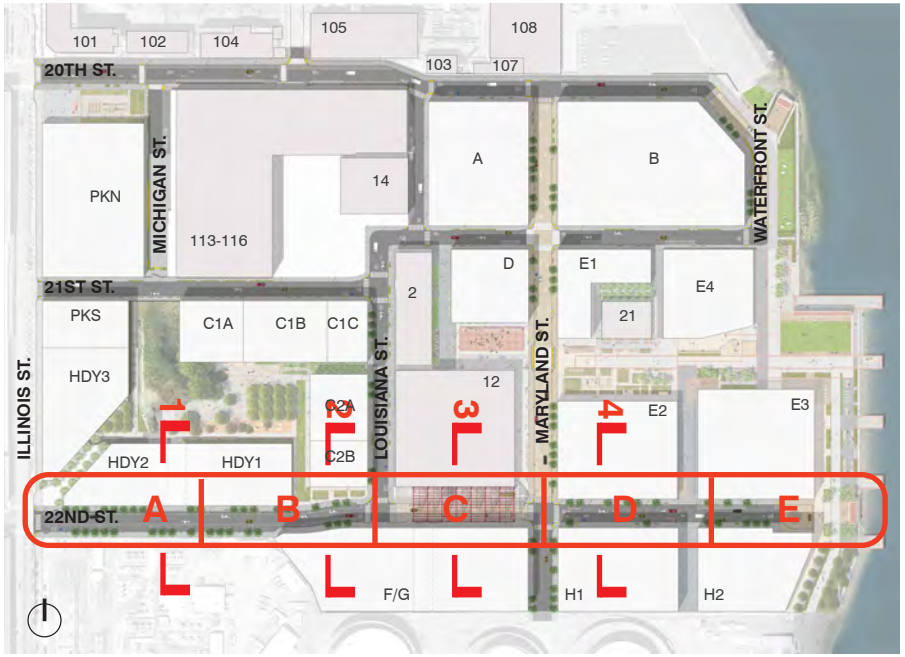
22nd Street runs west-east from Illinois Street to the waterfront, shifting in character across its length due to special topographic and historic features. The western portion of the street, located between Illinois Street and Louisiana street, is a mixed-use neighborhood street experiencing approximately 14 feet of grade change over 0.3 miles. This portion of the street is designed to accommodate pedestrian and bicycle activity, as well as vehicular traffic. Although a portion of this street is outside of the site boundary, it is included as part of the off-site project improvements.

Retaining walls may be required fronting the PG&E Switchyard and Hoedown Yard on 22nd Street where the existing street grade will be lowered. In the event that the project team cannot acquire a grading easement from the adjacent owners, interim retaining walls within the City R.O.W. will be constructed along PG&E Switchyard and Hoedown Yard.

The middle portion of 22nd Street between Louisiana Street and Maryland Street includes a historic edge with Building 12 on the north side of the right-of-way. The street is designed to allow for the Structural Frame of former Building 15 to remain in place overhead in an encroachment (see Sec. 5.3.2), serving as a gateway feature for the site. The columns on the south side of 22nd street will be located behind the curb of bulb-out. On the portion of 22nd Street sidewalk fronting the Building 12 Plaza, a seat wall divides the sidewalk from the plaza to accommodate a grade separation. This seat wall encroaches two feet into the sidewalk zone to provide seating for pedestrians. Planters and other elements in the Furnishing Zone have otherwise been limited to provide the maximum walkable area within the sidewalk. Enhanced concrete paving should be used for the roadway as an extension of the plaza. A bike share is provided in this portion of street.

The eastern portion of 22nd Street ends at the waterfront in a terminus that serves as a turn-around for vehicles as well as a pedestrian-friendly plaza with enhanced paving. Enhanced paving for the entire eastern portion of 22nd Street between Maryland Street and the Waterfront is an option for consideration.

A fire truck turn-around is located between Buildings E2 and E3. A MUNI bus route runs along 22nd Street between Illinois Street and Maryland Street, and then runs south on Maryland Street, which connects the Project to Caltrain and Dogpatch neighborhood center. This bus route requires the travel lanes to be 11 feet wide in both directions in the western and middle portions of 22nd Street.

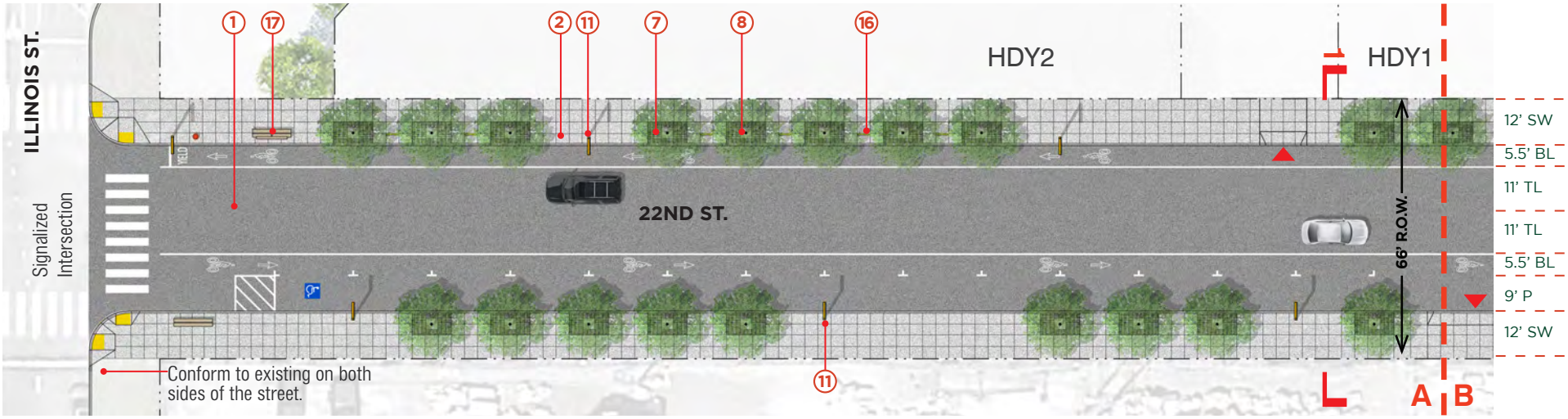


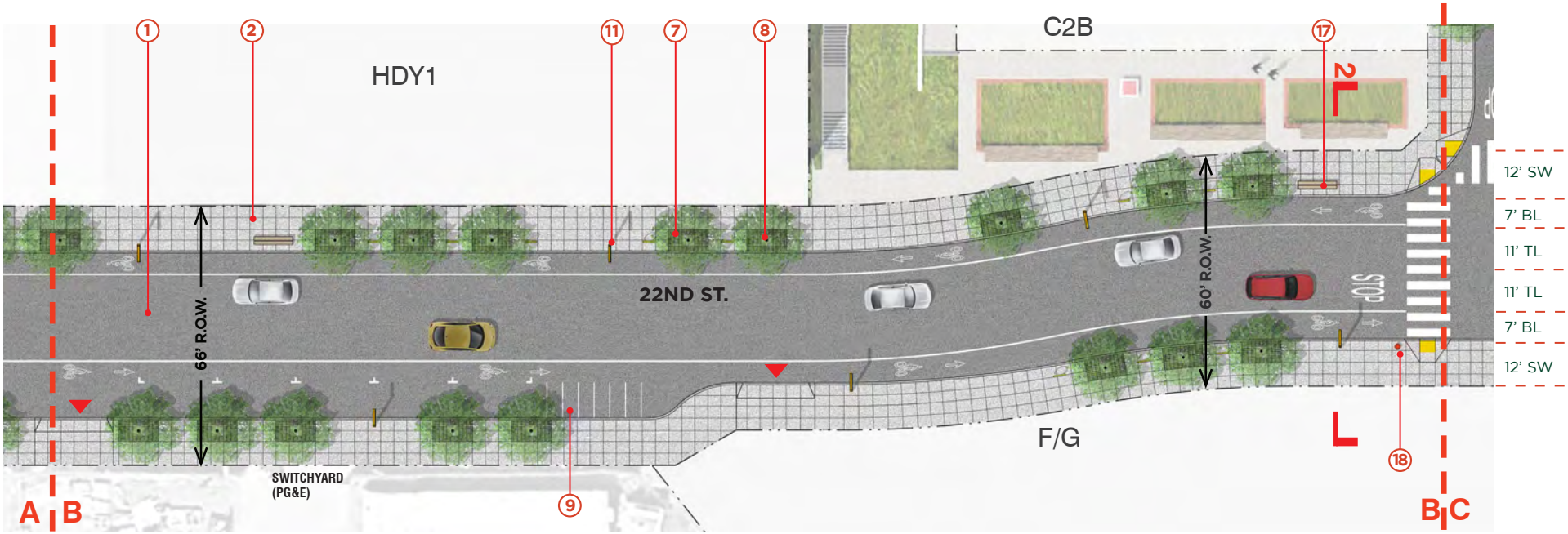
MUNI stops for a standard 40' bus will be added in the future at the near-side locations of the intersection of 22nd Street and Maryland Street. As shown with a dashed line, transit bulbs with a minimum length of 35', in accordance with the Better Streets Plan (Chapter 5.5), will be designed to accommodate the MUNI stops. See Chapter 2.8.1 for a detailed description of MUNI stops and transit bulbs.

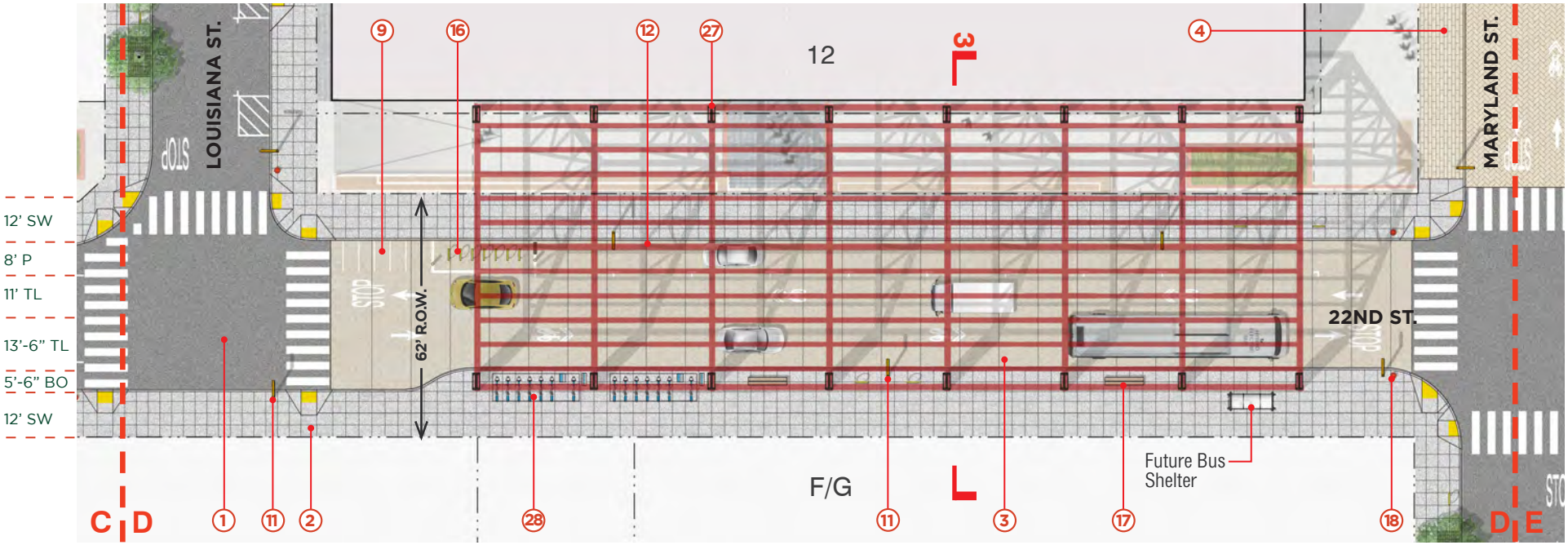
On the portion of 22nd Street along Buildings HDY1 and HDY2, trees are spaced at 20 feet on center, with some trees removed for lights and driveways. From Building C2 to the waterfront, trees are clustered around intersections and placed irregularly to appear additive and compliment historic elements. See Figure 3.1.2, page 54, for Typical Intersection Sightlines Clearance Diagram.

Note: The intersection at 22nd Street and Louisiana Street is addressed in the Louisiana Street section (pg. 100). The outbound MUNI stop and the intersection at 22nd Street and Maryland Street are addressed in the Maryland Street section (pg. 92).

22ND STREET PLAN ENLARGEMENTS







1. Roadway - Asphalt
2. Concrete Sidewalk
3. Concrete Paving - Vehicular
4. Concrete Unit Pavers - Vehicular + Pedestrian
7. Tree Well Surfacing
8. Tree Well Trunk Opening
9. Motorcycle Parking
11. Street Light With Pull Box
12. Suspended Light
16. Bike Rack / Corral
17. Bench
18. Litter + Recycling Receptacle
27. Structural Frame
28. Bike Share Station

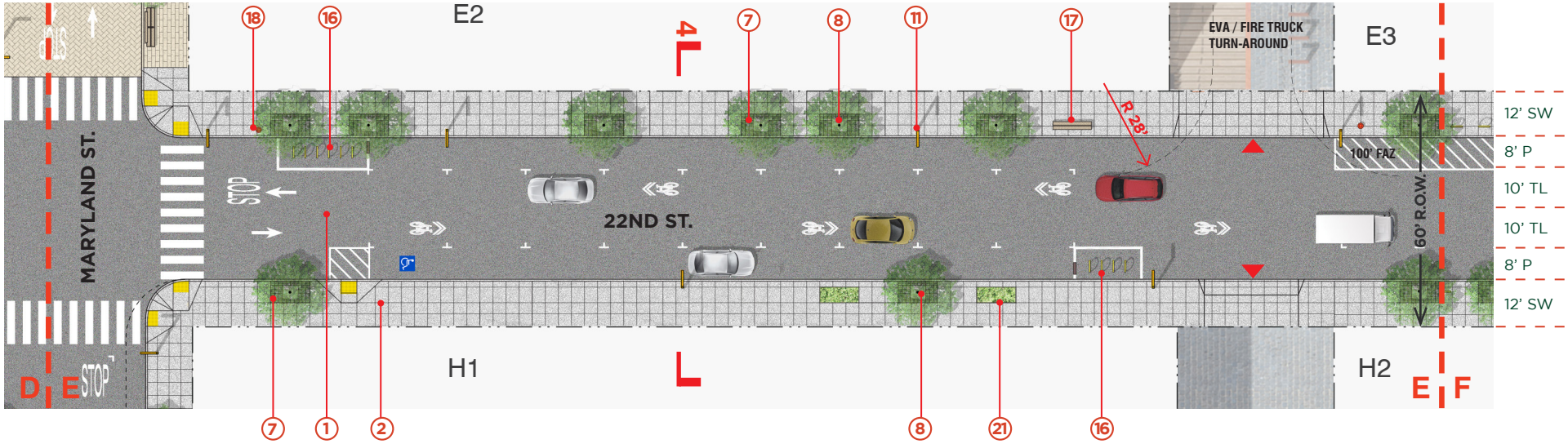
▲ Driveway Curb Cut

BL - bicycle lane
BO - Bulb-out
P - parking
SW - sidewalk
TL - travel lane

Note 1: Refer to Master Material Palette on page 108 for more specific information on materials and products.

Note 2: All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

0 20' 40' 80'

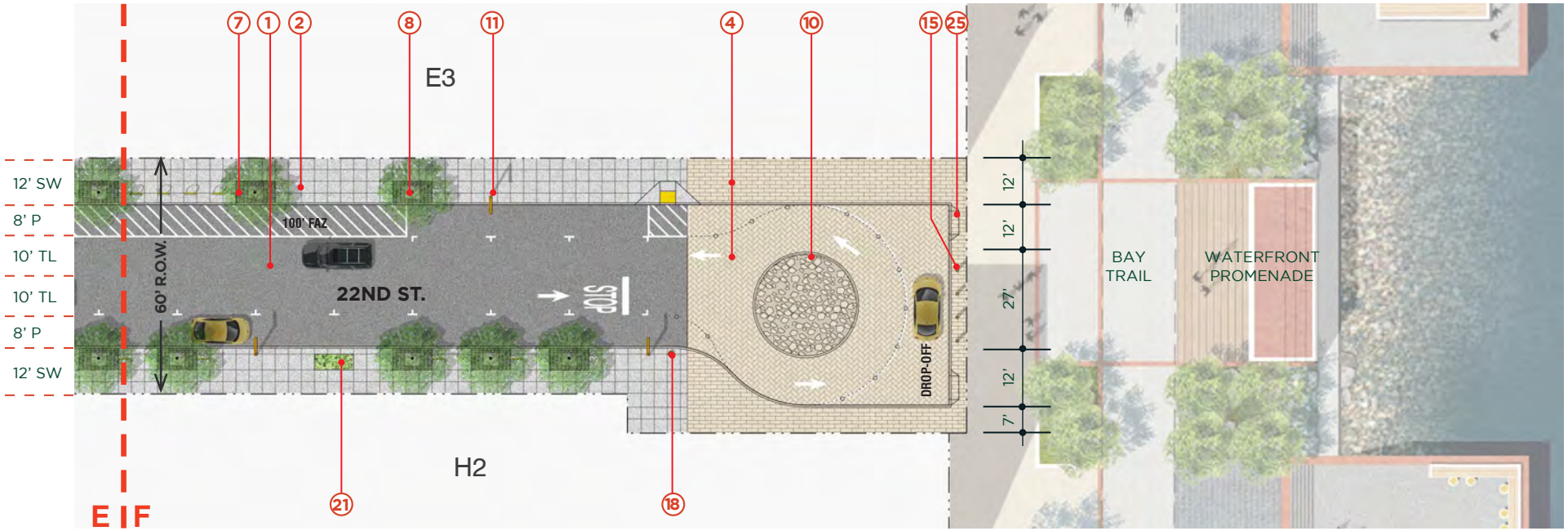


1 Roadway - Asphalt
2 Concrete Sidewalk
7 Tree Well Surfacing
8 Tree Well Trunk Opening
11 Street Light
16 Bike Rack / Corral
17 Bench
18 Litter + Recycling Receptacle
21 Low Planting

P - parking
SW - sidewalk
TL - travel lane
FAZ - fire access zone

Note 1: Refer to Master Material Palette on page 108 for more specific information on materials and products.

Note 2: All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.



Precedent Image: Davis Court, SF.
Photo Credit: European Paving Design

1 Roadway - Asphalt
2 Concrete Sidewalk
4 Concrete Unit Pavers - Vehicular + Pedestrian
7 Tree Well Surfacing
8 Tree Well Trunk Opening
10 Traffic Island
11 Street Light
14 Fixed Bollard
15 Removable Bollard
18 Litter + Recycling Receptacle
21 Low Planting
25 Curb Cut for Bicycles

P - parking
SW - sidewalk
TL - travel lane
FAZ - fire-access zone

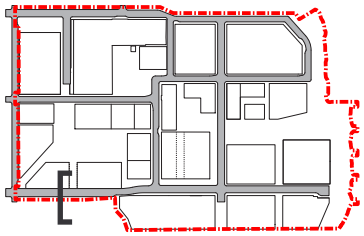
0 20' 40' 80'

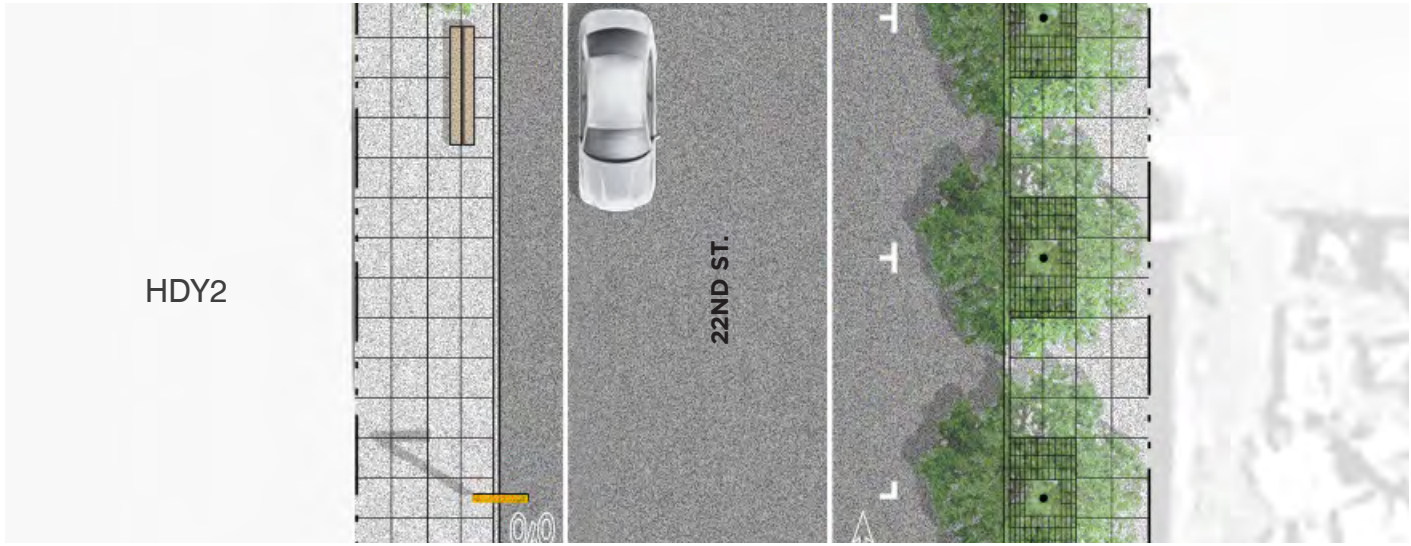
Note 1: Refer to Master Material Palette on page 108 for more specific information on materials and products.

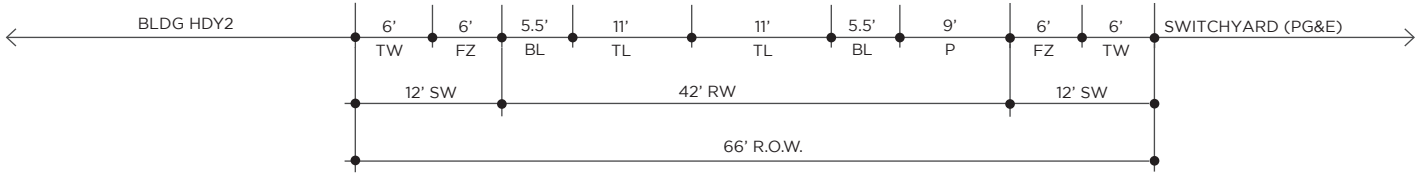
Note 2: All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

Note 3: No planting or site furnishing is permitted on the south side of the terminus sidewalk.

22ND STREET SECTION - 1



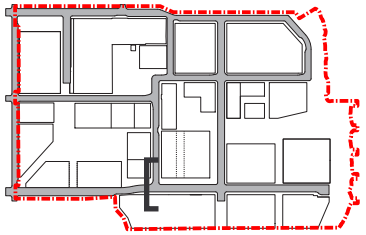


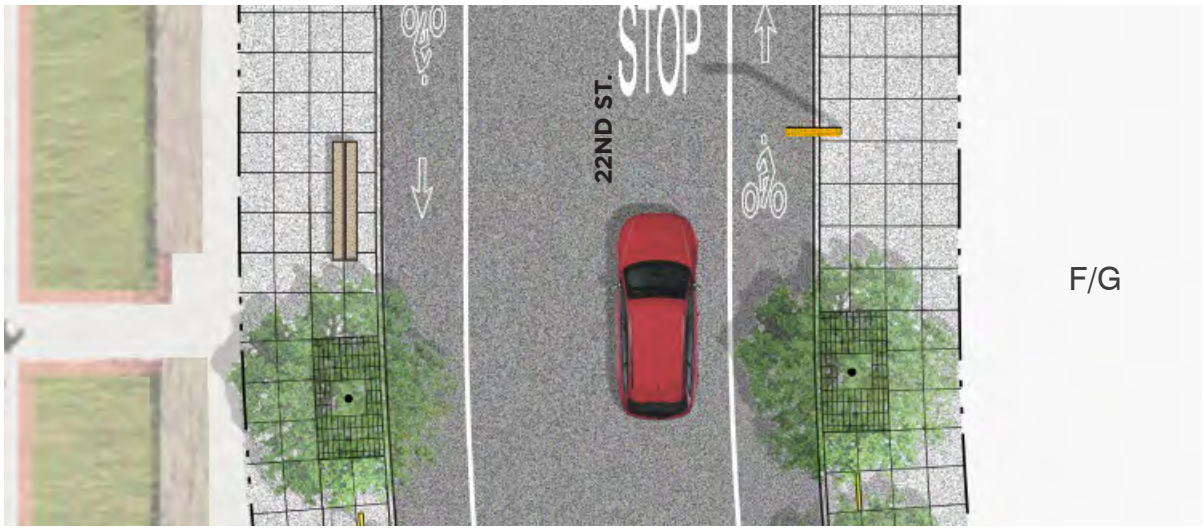


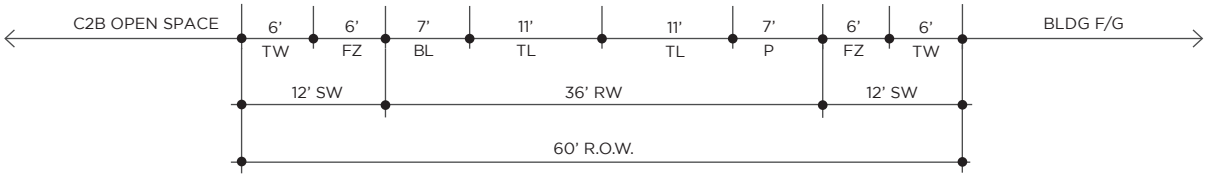
BL - bicycle lane
BLDG - building
CS courtesy strip
FZ - furnishing zone
P - parking
R.O.W. - right of way
RW - roadway
SHW sharrows
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

22ND STREET SECTION - 2



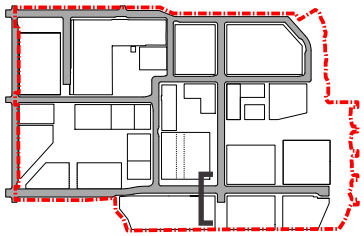


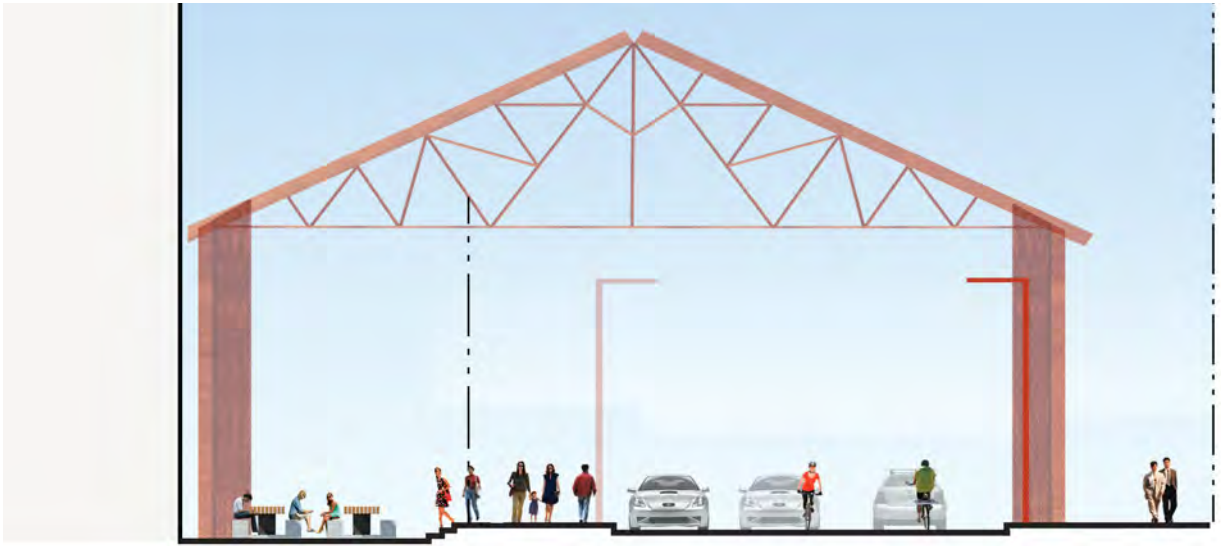


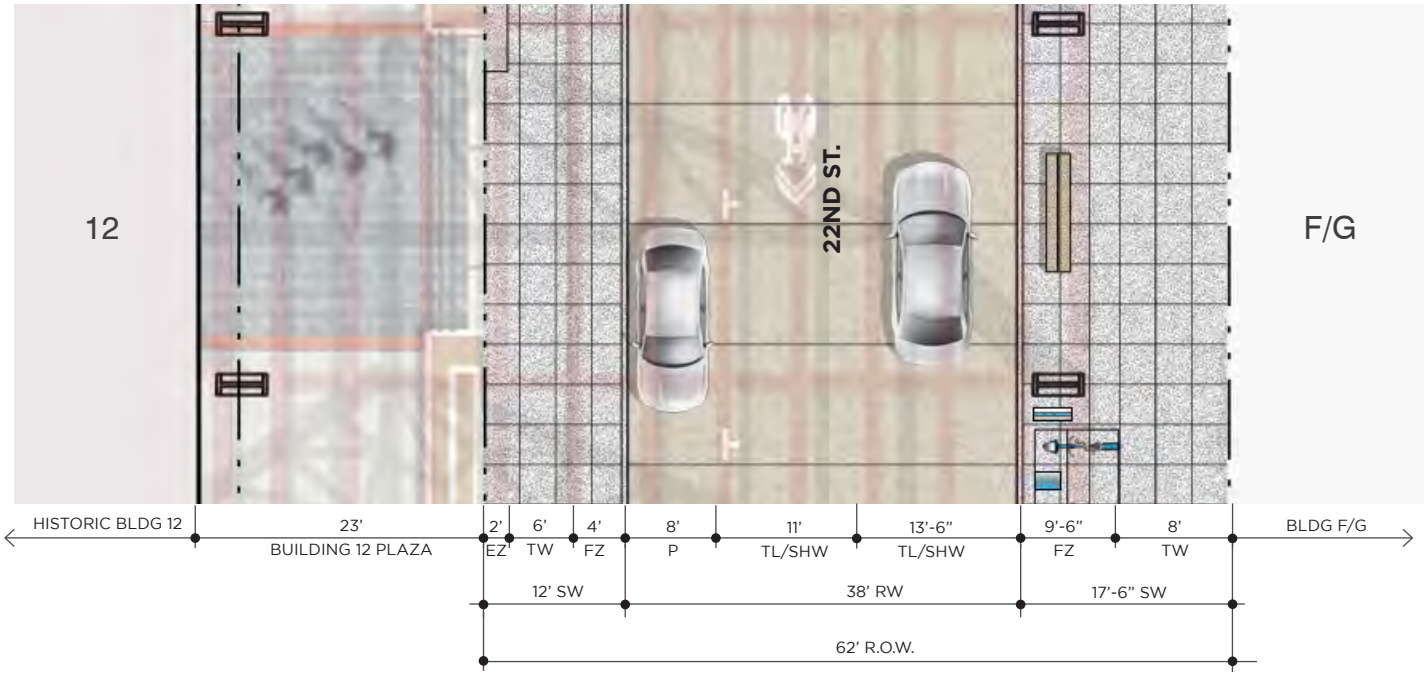
BL - bicycle lane
BLDG - building
CS courtesy strip
FZ - furnishing zone
P - parking
R.O.W. - right of way
RW - roadway
SHW sharrows
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

22ND STREET SECTION - 3



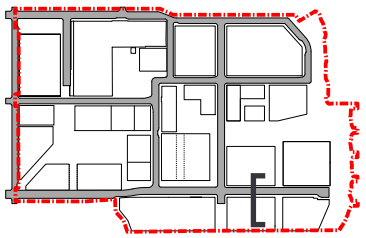


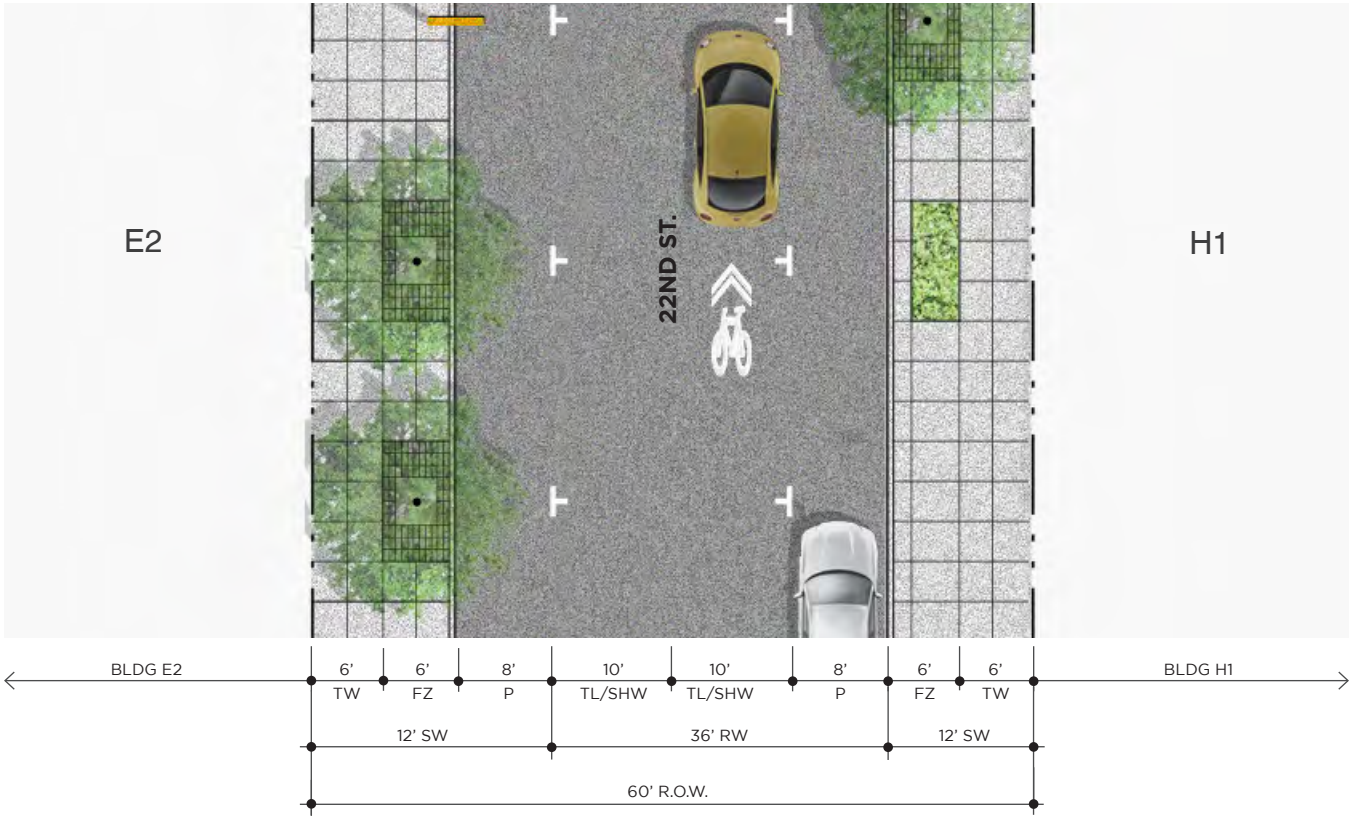


BLDG building
EZ- encroachment zone
FZ - furnishing zone
P - parking
TW - throughway
R.O.W. - right of way
RW - roadway
SHW - sharrows
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

22ND STREET SECTION - 4





BLDG - building
CS - courtesy strip
FAZ - fire-access zone
FZ - furnishing zone
P - parking
R.O.W. - right of way
RW - roadway
SHW - sharrows
SW - sidewalk
TL - travel lane
TW - throughway

Photo Credit: Design Distill / Brookfield

Maryland Street Rendering

3.6 MARYLAND STREET

Maryland Street is a vital commercial and neighborhood retail street and a key north-south connector. This street experiences a higher volume of pedestrian activity in general, and especially in the vicinity of retail, adjacent plazas and parks. Maryland Street between 20th Street and 22nd Street features unit pavers - a special tactile treatment that serves as a traffic-calming strategy.

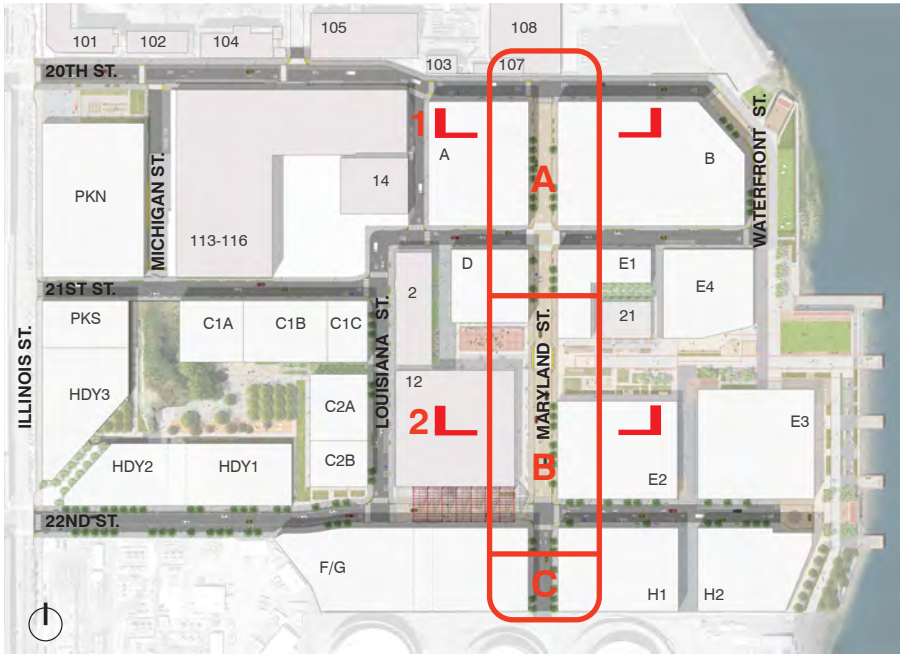
Maryland Street, between 21st Street and 22nd Street, includes a crosswalk with special treatment that connects the two most active open spaces of the site – Market Square and Slipways Commons. The portion of Maryland Street between these two open spaces features a special paving pattern emphasizing pedestrian connectivity. This portion of Maryland Street between 21st and 22nd street is designed to accommodate regular closures to through traffic for community events, markets and festivals, while allowing continuous access for emergency vehicles.

A fire truck turn-around / EVA access is provided at the entrance of Slipways Commons to serve Building 21. A TMA shuttle stop is provided near the mid-block crossing.

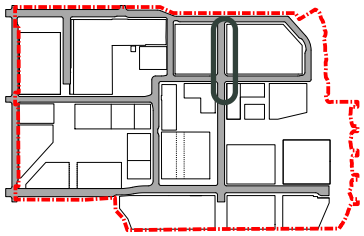
In the southern portion of Maryland Street, south of 22nd Street, 11-foot travel lanes in both directions are required for the MUNI route. The overall right-of-way is 62 feet in this portion of Maryland Street. This portion of Maryland Street, and the intersection of 22nd Street and Maryland Street are optional for enhanced paving to keep with the character of Maryland Street. Street trees should be placed at regular intervals in the southern portion of Maryland Street with breaks where street lights are placed and driveway curb cuts occur.

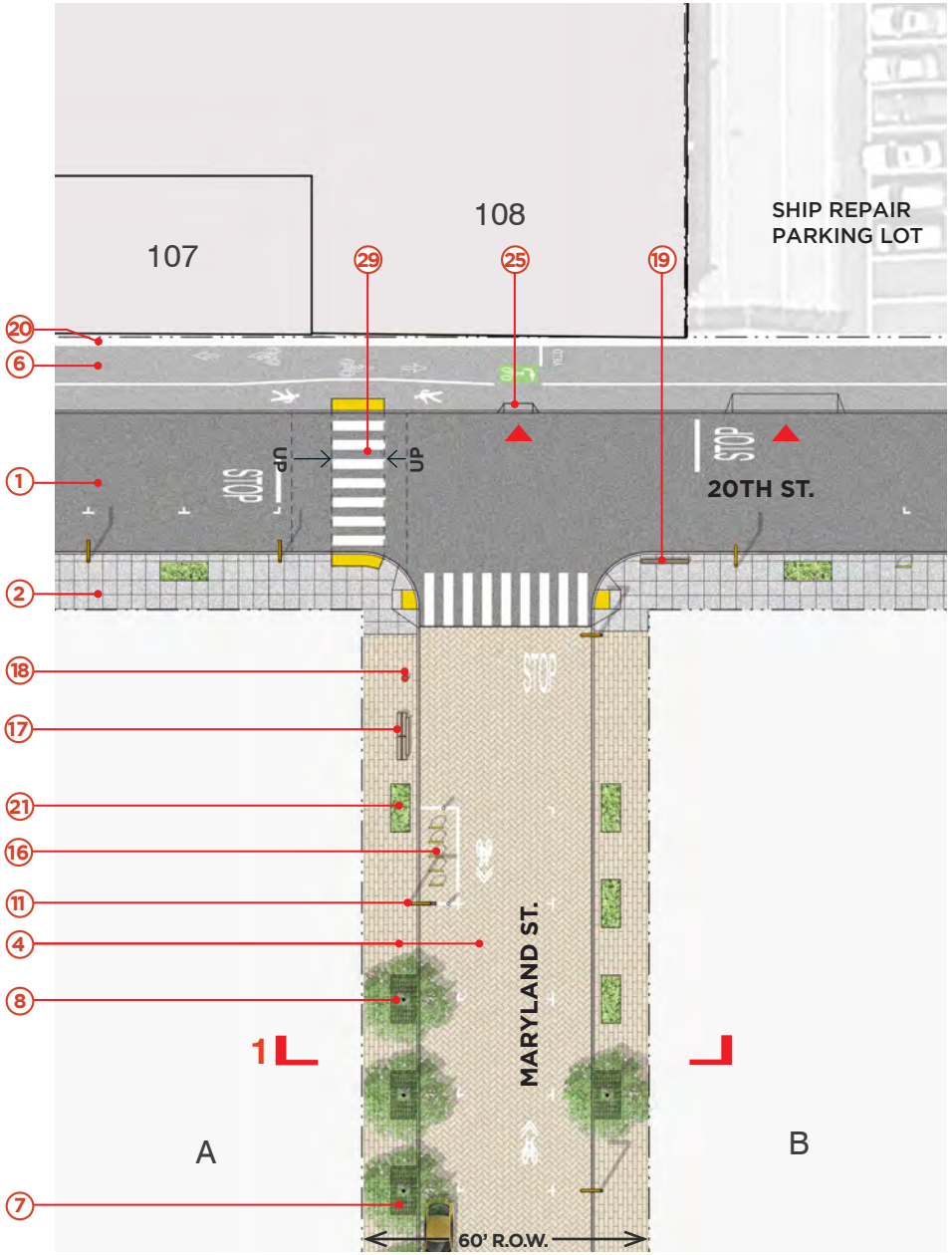
MUNI stops for a standard 40' bus will be added in the future at the near-side locations of the intersection of 22nd Street and Maryland Street. As shown with a dashed line, transit bulbs with a minimum length of 35', in accordance with the Better Streets Plan (Chapter 5.5), will be designed to accommodate the MUNI stops. See Chapter 2.8.1 for a detailed description of MUNI stops and transit bulbs.

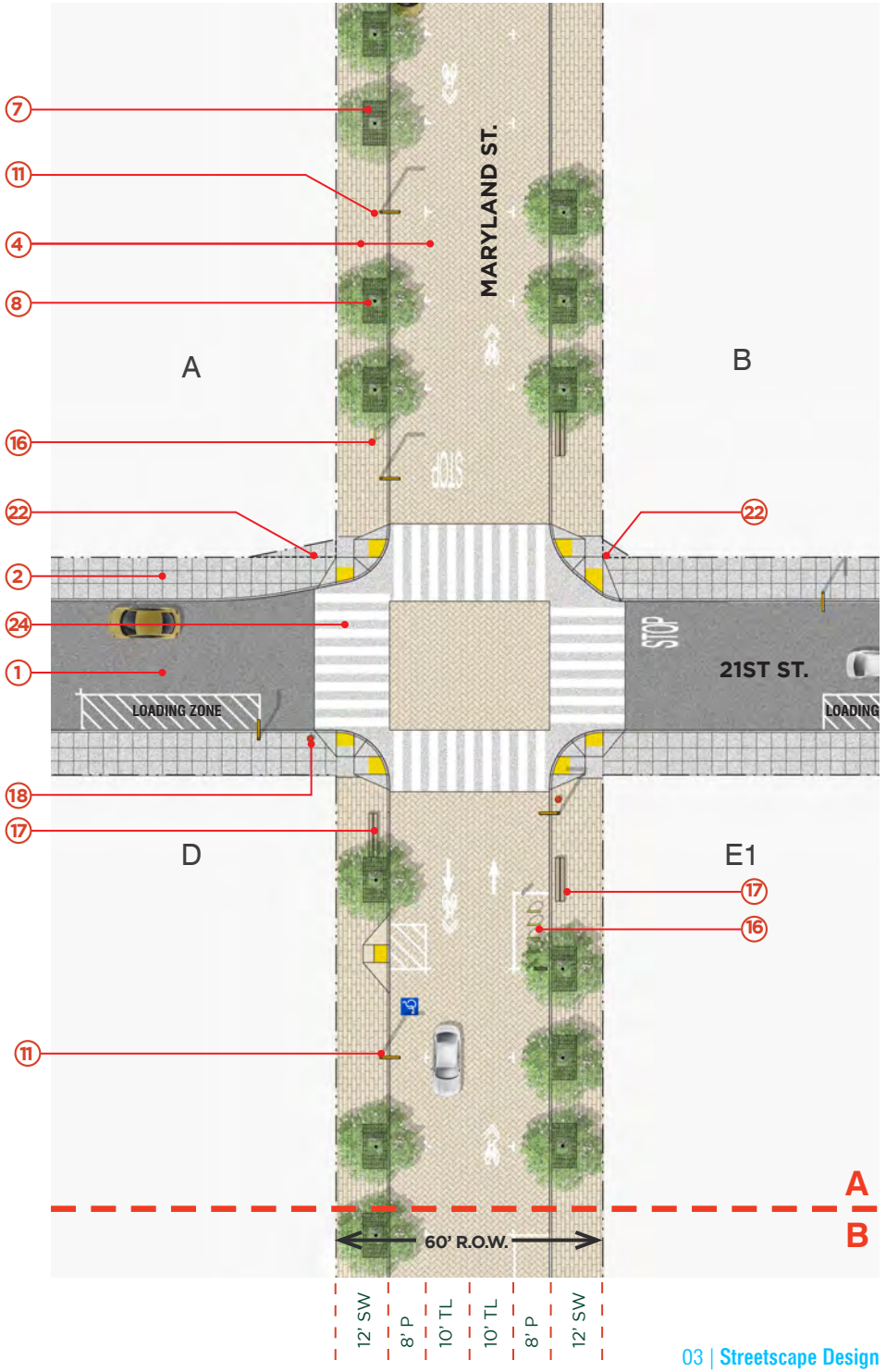
The intersections of Maryland Street with 21st Street feature a special paving treatment, ensuring continuous character and materiality along Maryland Street. These intersections are all stop sign controlled.



MARYLAND STREET PLAN ENLARGEMENT







1. Roadway - Asphalt
2. Concrete Sidewalk
3. Enhanced Concrete Paving at Plaza
4. Concrete Unit Pavers - Vehicular + Pedestrian
5. Warning Pavers
6. Bay Trail
7. Tree Well Surfacing
8. Tree Well Trunk Opening
11. Street Light
16. Bike Rack
17. Bench
18. Litter + Recycling Receptacle
19. Sculptural Barrier
20. 2' Bay Trail Buffer Zone
21. Low Planting
22. Building Overhang
25. Curb Cut for Bicycles
24. Special Treatment for Pedestrian Crosswalk

▲ Driveway Curb Cut

0 20' 40' 80'

P - parking
SW - sidewalk
TL - travel lane

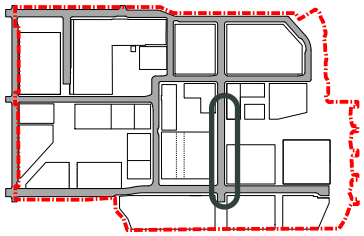
Note:

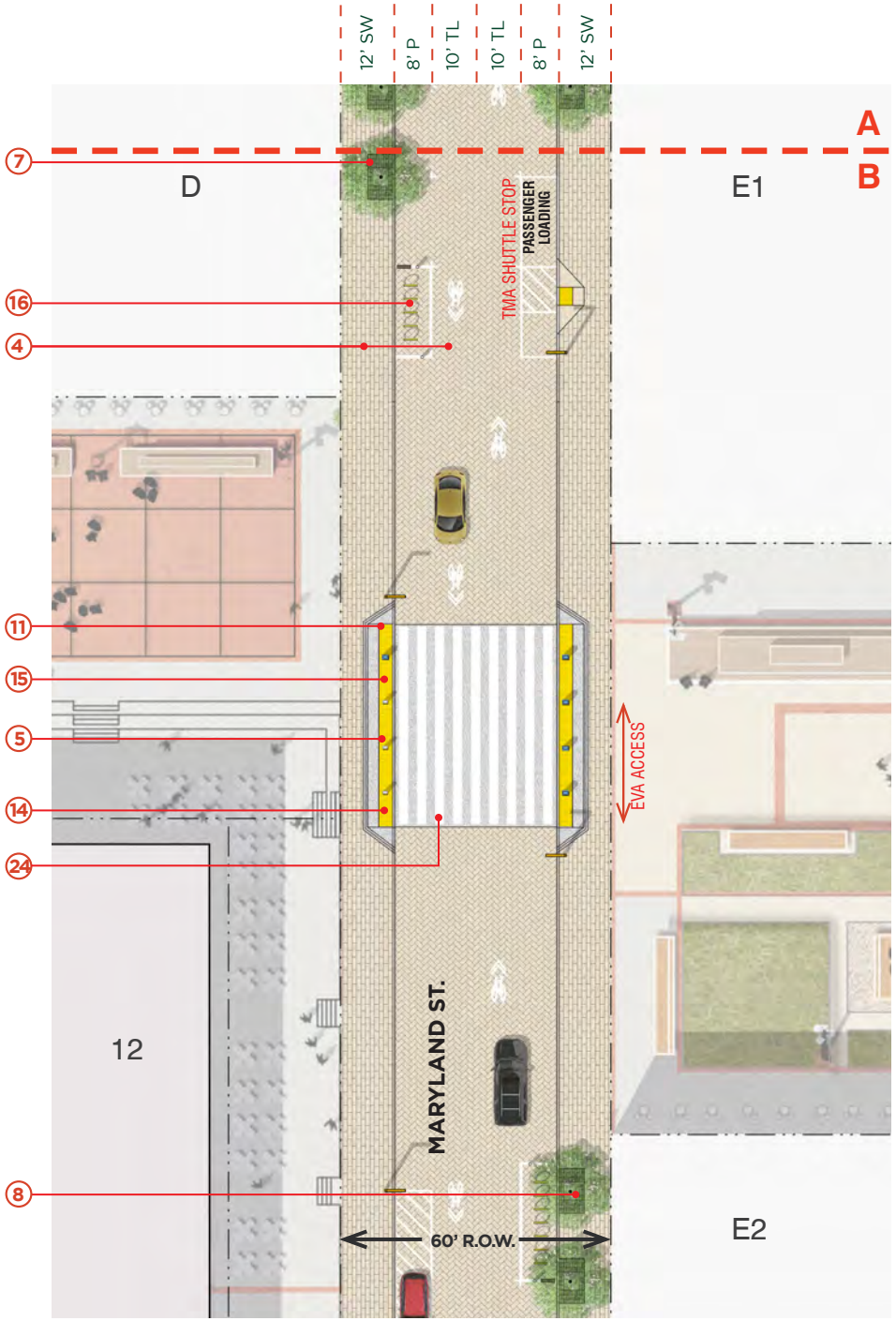
1. Refer to Master Material Palette on page 108 for more specific information on materials and products.

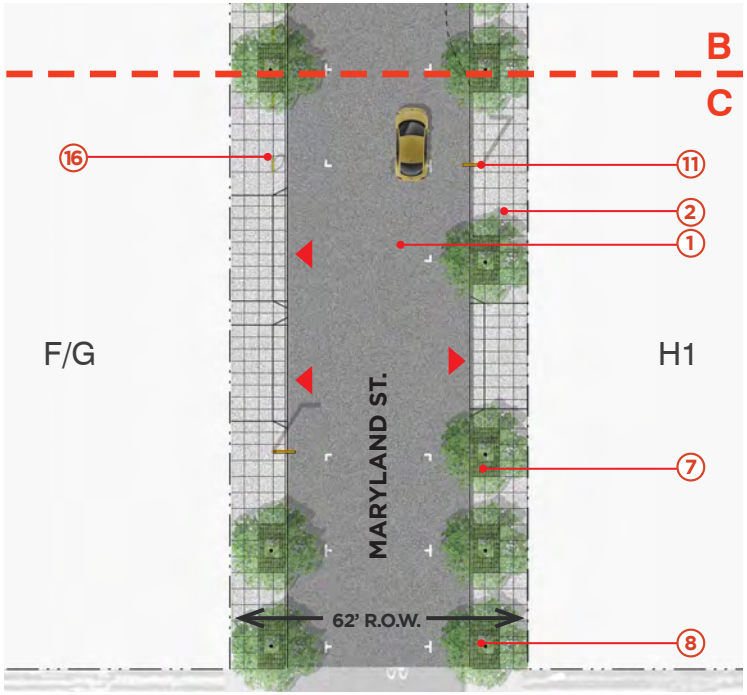
2. All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

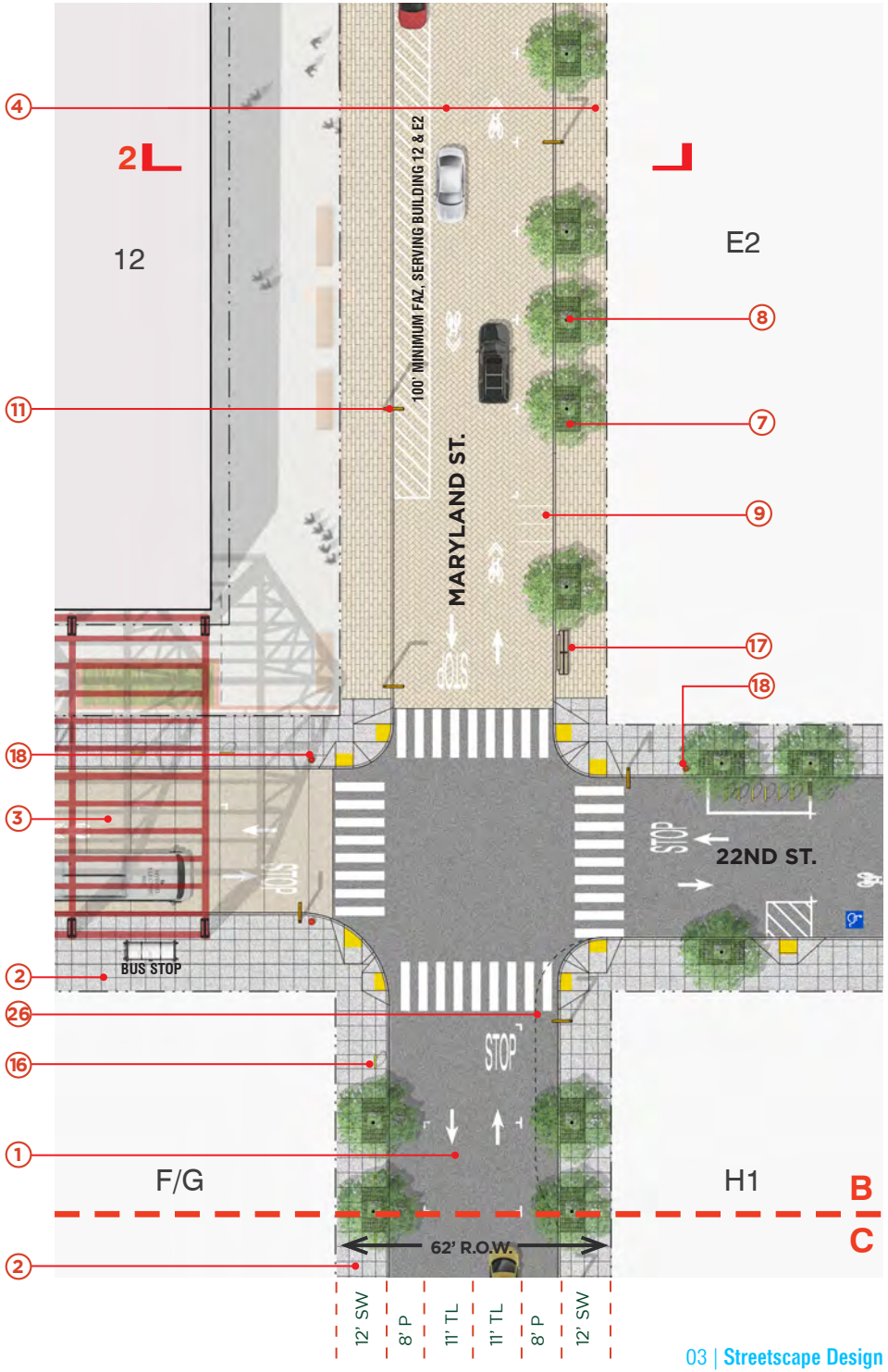
3: The final design of the special treatment at crosswalks, as well as the exact size and other details, will be determined as part of the improvement plan development and approvals.

MARYLAND STREET PLAN ENLARGEMENT









1. Roadway - Asphalt
2. Concrete Sidewalk
4. Concrete Unit Pavers - Vehicular + Pedestrian
5. Warning Paver
7. Tree Well Surfacing
8. Tree Well Trunk Opening
9. Motorcycle Parking
11. Pole Light
14. Fixed Bollards
15. Removable Bollards
16. Bike Racks
17. Benches
18. Litter + Recycling Receptacle
24. Special Treatment for Pedestrian Crosswalk
26. Future Near-Side MUNI Transit Bulb (outbound, min. length 35')

▲ Driveway Curb Cut

P - parking
SW - sidewalk
TL - travel lane
FAZ - fire-access zone

Note:

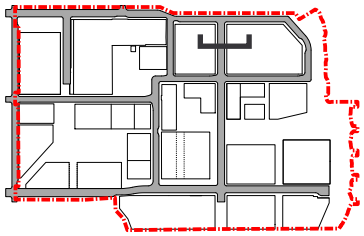
1. Refer to Master Material Palette on page 108 for more specific information on materials and products.

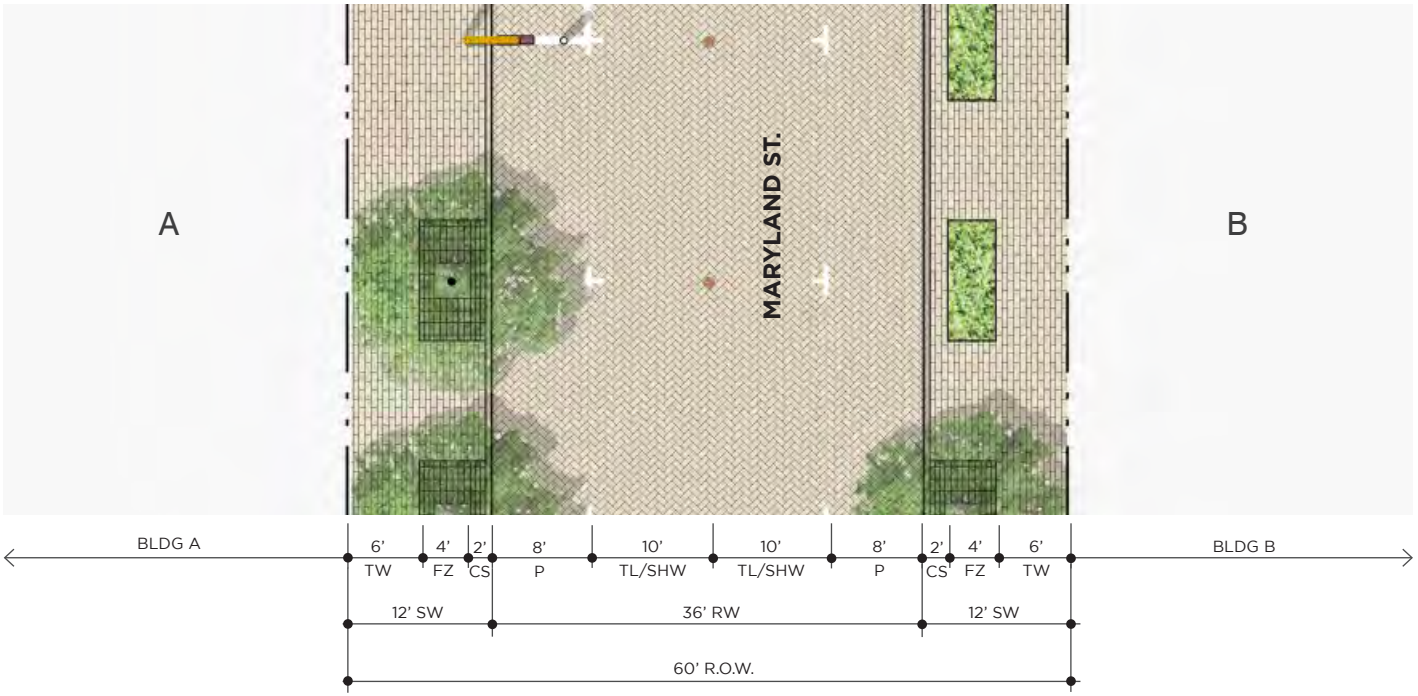
2. All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

3: The final design of the special treatment at crosswalks, as well as the exact size and other details, will be determined as part of the improvement plan development and approvals.

0 20' 40' 80'

MARYLAND STREET SECTION - 1

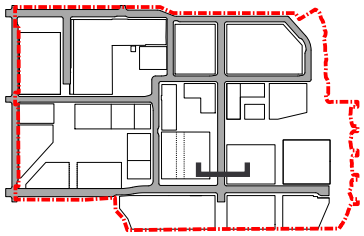


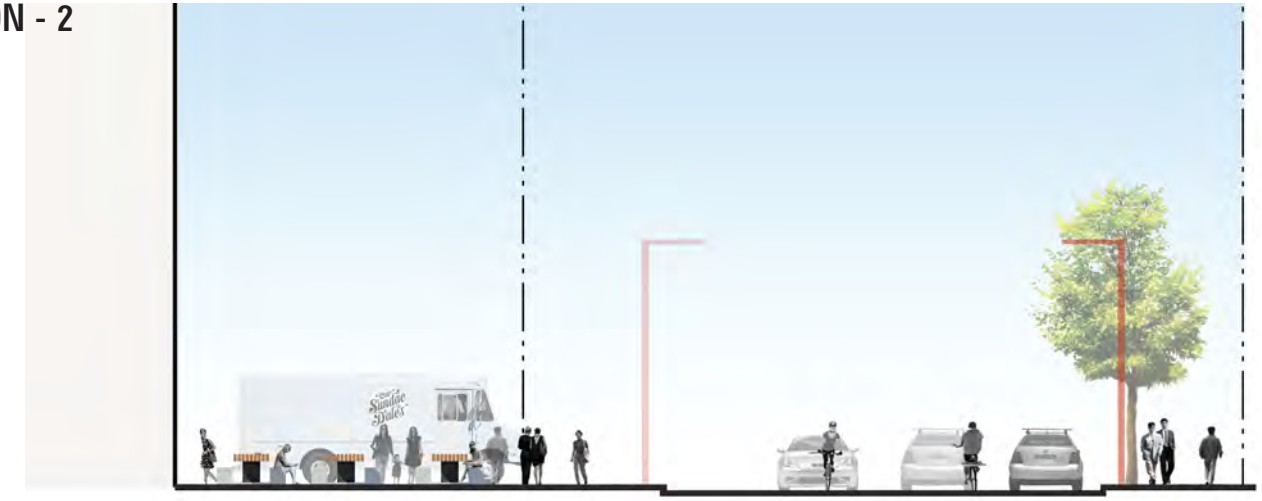


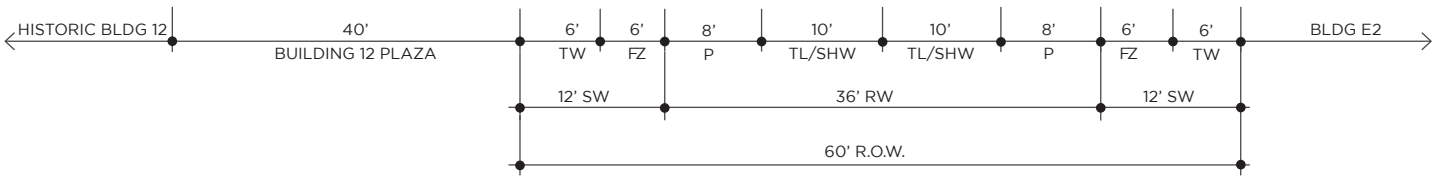
BLDG - building
CS - courtesy strip
FZ - furniture zone
P - parking
PL - planting
R.O.W. - right of way
RW - roadway
SHW - sharrow
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

MARYLAND STREET SECTION - 2







BLDG - building
FZ - furniture zone
P - parking
TW - throughway
R.O.W. - right of way
RW - roadway
SHW - sharrow
SW - sidewalk
TL - travel lane
WP - warning pavers

Photo Credit: Shae Rocco / Brookfield

Louisiana Street

3.7 LOUISIANA STREET

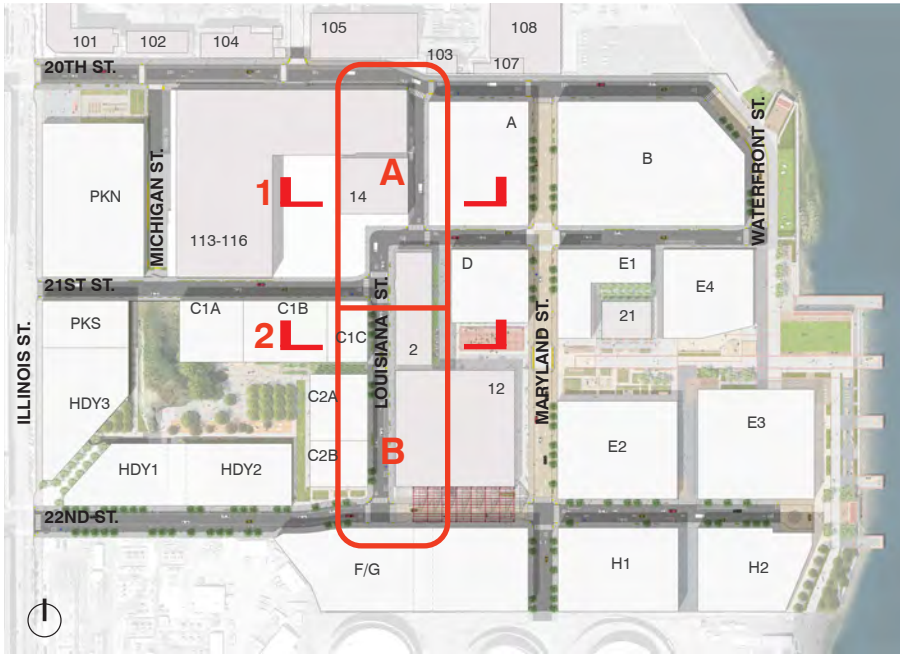
The northern portion of Louisiana Street, located between 20th Street and 21st Street, is a one-way south-bound service alley designed to accommodate access needs for manufacturers and businesses, including loading activities and heavy trucks. The northern portion of Louisiana Street prioritizes pedestrian activity adjacent to the Historic Piazza and surrounding Historic Buildings. Only the east side of Louisiana Street has a sidewalk. The northern portion of Louisiana Street will be retained as a Port Street, rather than dedicated to the City as a public ROW.

The southern portion of Louisiana Street, located between 21st Street and 22nd Street, is a mixed-use street and is designed to accommodate vehicular circulation, including shuttles and access to parking.

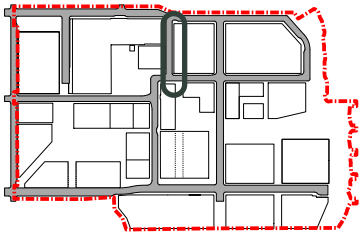
Street trees should be placed at regular intervals on the west side of the street in the southern portion of Louisiana Street. Low planting should be provided in the southern portion of Louisiana Street.

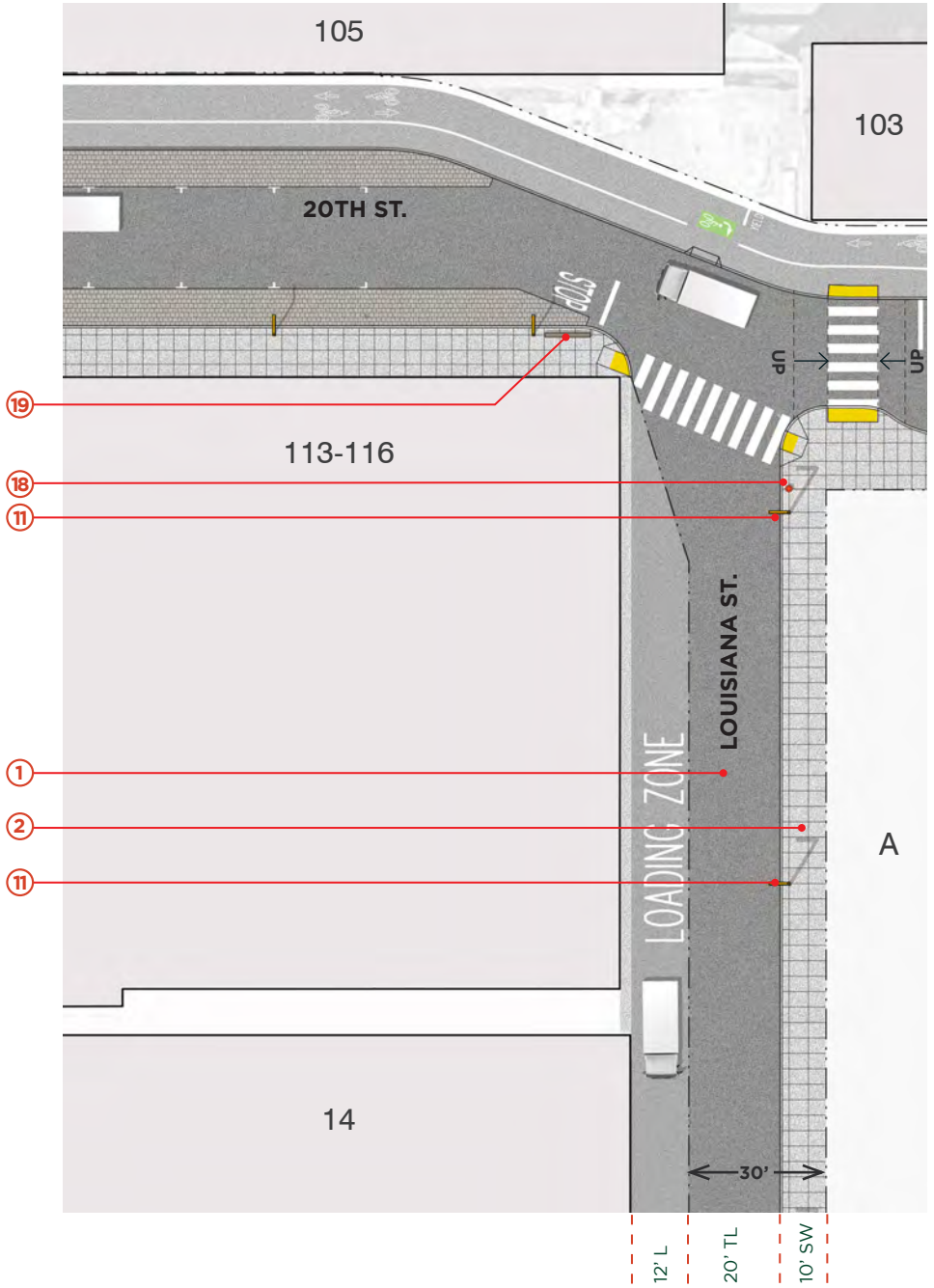
The intersection of Louisiana Street and 20th Street occurs where 20th Street jogs at Building 103. This is a three-way, stop sign-controlled intersection. A sculptural barrier is provided to deter pedestrians from crossing 20th Street west of this intersection.

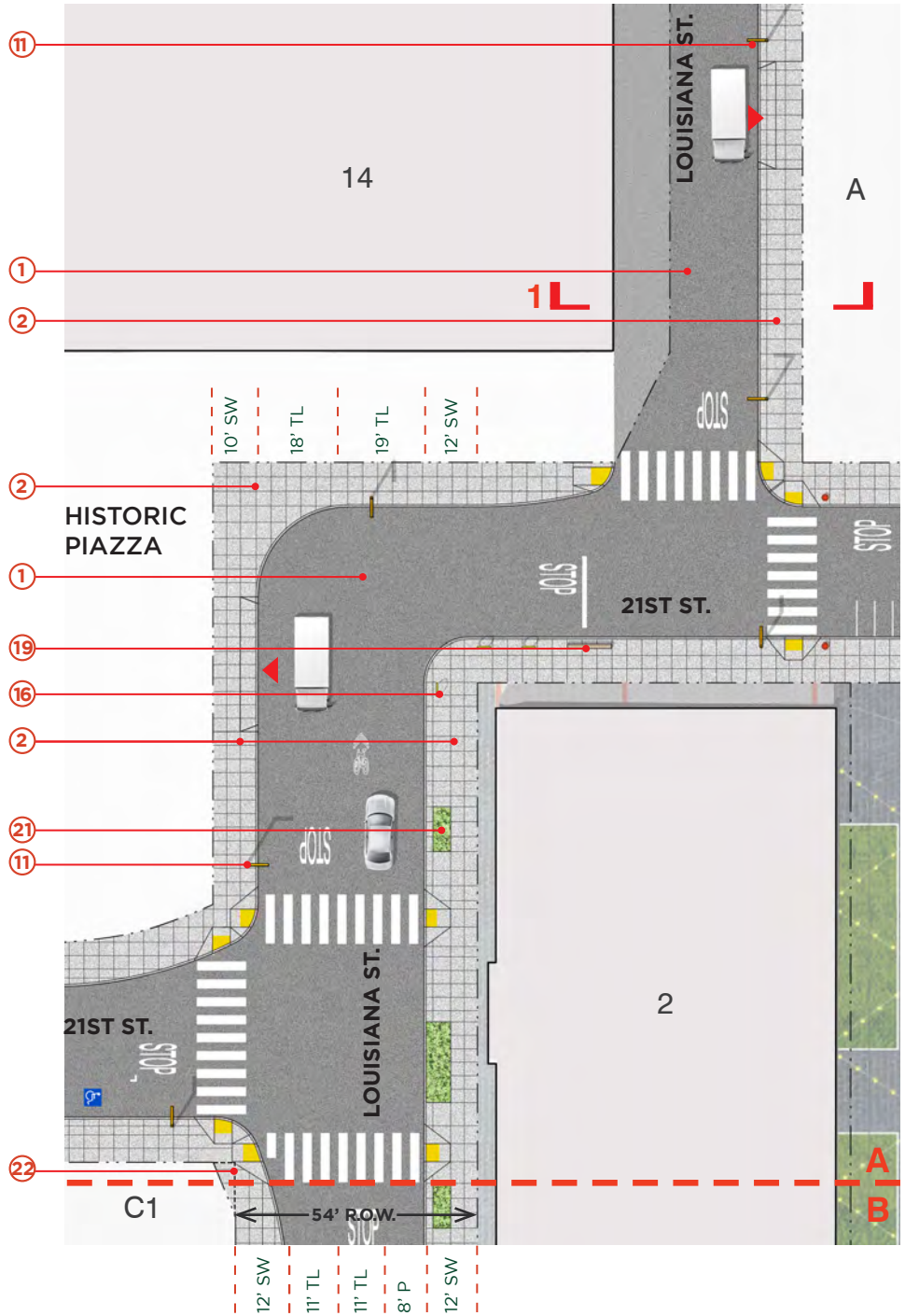
At Louisiana Street and 21st Street there are two intersections connecting the eastern and western portions of 21st Street, which disconnect at Louisiana Street to accommodate the Historic Piazza and Historic Buildings. A curb cut is provided on Louisiana Street for vehicular access to the Historic Piazza. Both intersections are stop sign-controlled and include crosswalks in all directions. A sidewalk along the Historic Piazza provides continuity of pedestrian circulation along 21st Street, as well as pedestrian access to the Historic Piazza.



LOUISIANA STREET PLAN ENLARGEMENT







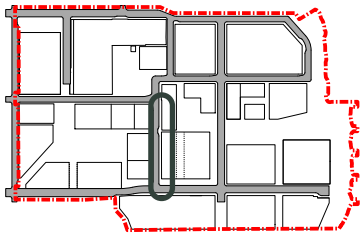
1 Roadway - Asphalt
2 Concrete Sidewalk
11 Street Light
16 Bike Racks
17 Benches
18 Litter + Recycling Receptacle
19 Sculptural Barrier
21 Low Planting
22 Building Overhang
Driveway Curb Cut

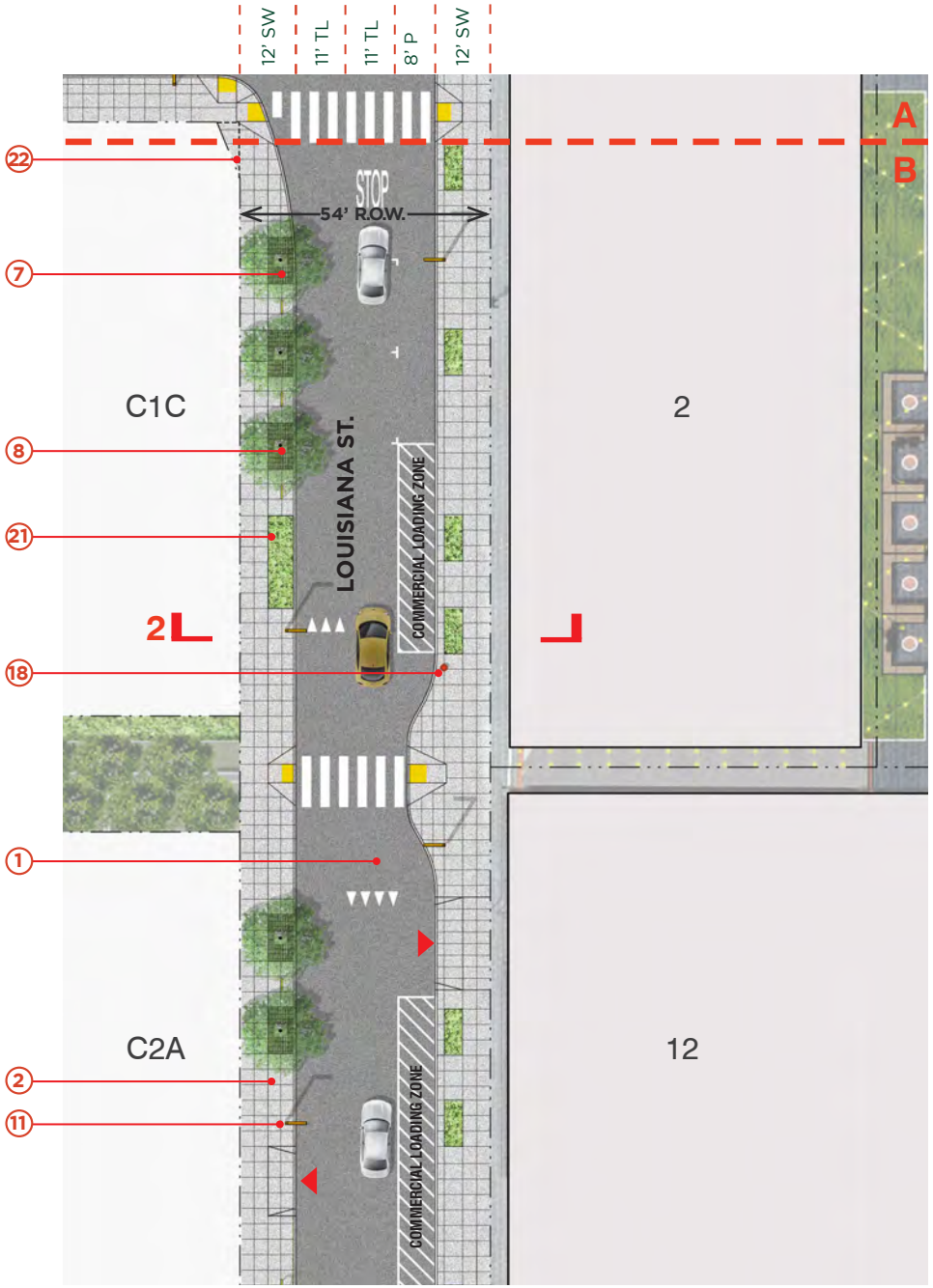
0 20' 40' 80'

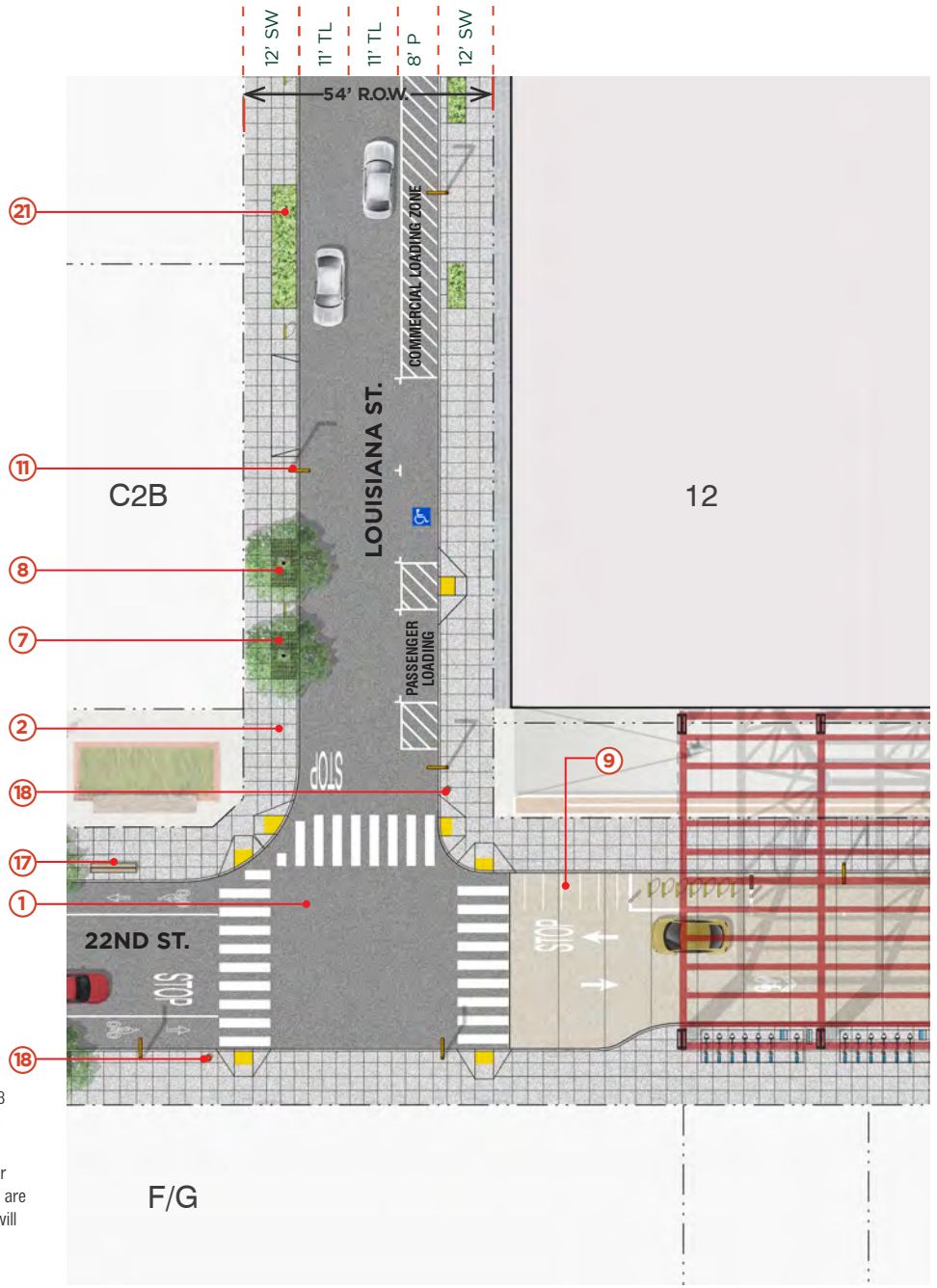
L - loading
P - parking
SW - sidewalk
TL - travel lane

Note: Refer to Master Material Palette on page 108 for more specific information on materials and products.

LOUISIANA STREET PLAN ENLARGEMENT







1 Roadway - Asphalt
2 Concrete Sidewalk
7 Tree Well Surfacing
8 Tree Well Trunk Opening
9 Motorcycle Parking
11 Pole Light
17 Bench
18 Litter + Recycling Receptacle
21 Low Planting
22 Building Overhang
Driveway Curb Cut

0 20' 40' 80'

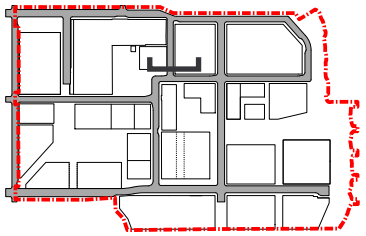
P - parking
SW - sidewalk
TL - travel lane

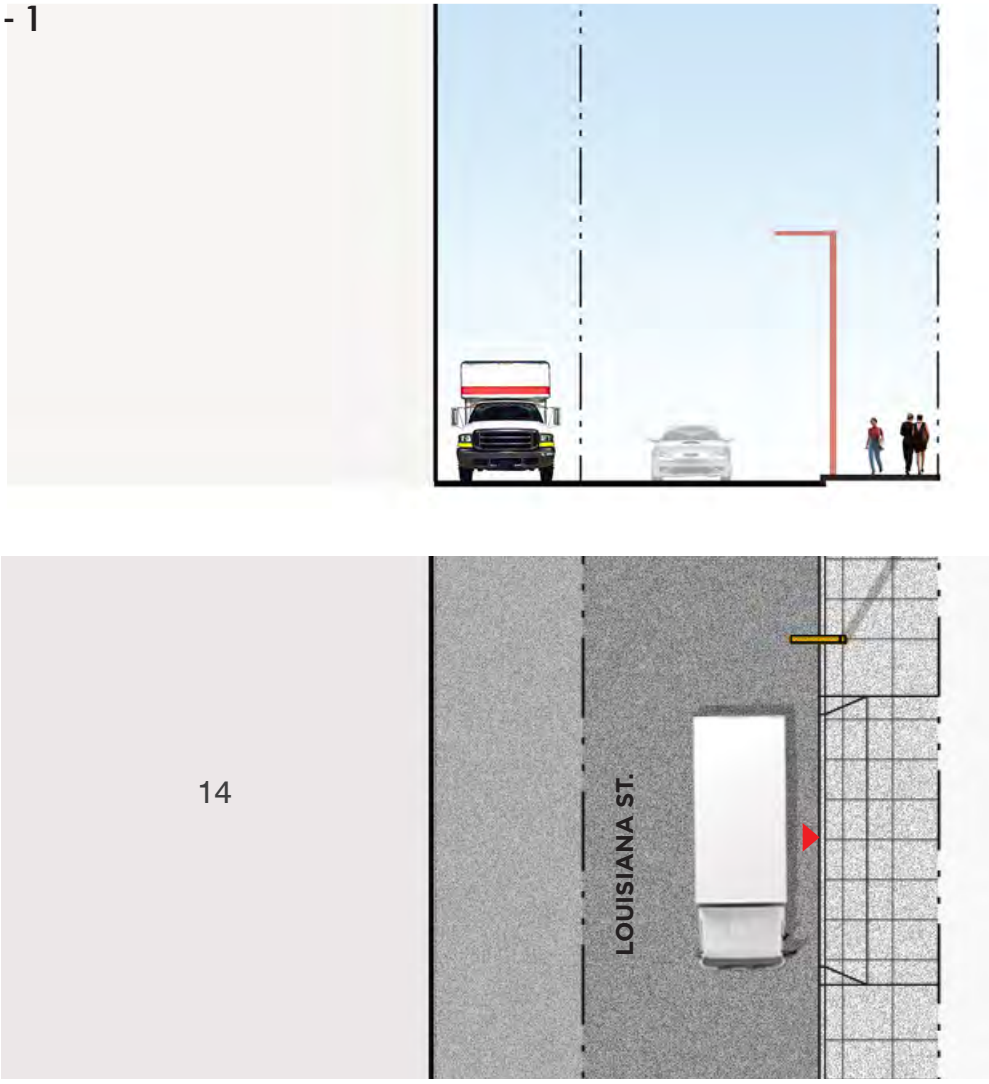
Note:

1. Refer to Master Material Palette on page 108 for more specific information on materials and products.

2. All striping for Fire Access Zones, Passenger Loading Stalls, and Commercial Loading Areas are for graphics purposes only, and detail design will be submitted with improvement plans.

LOUISIANA STREET SECTION - 1

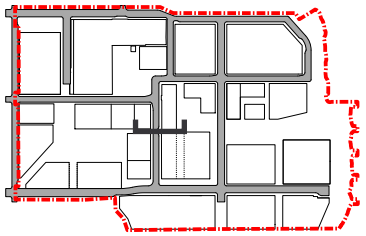


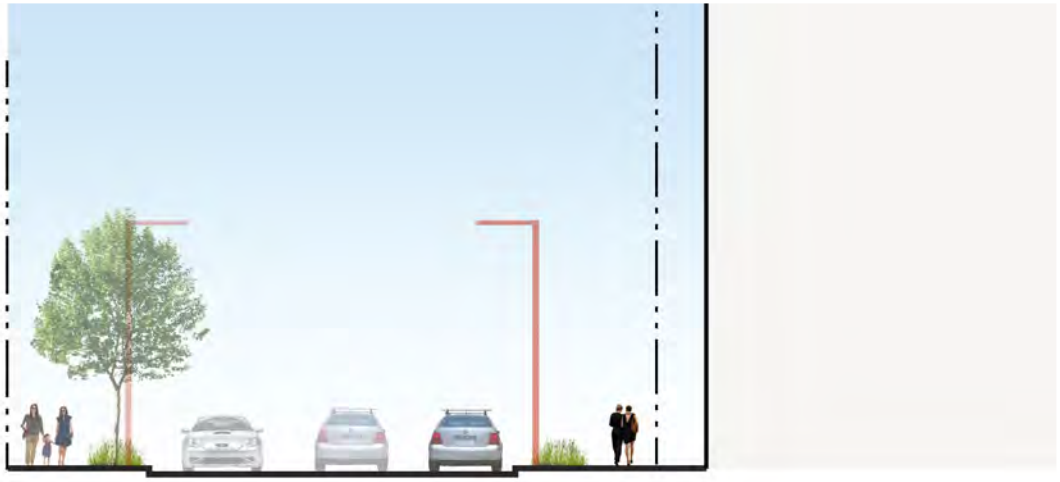


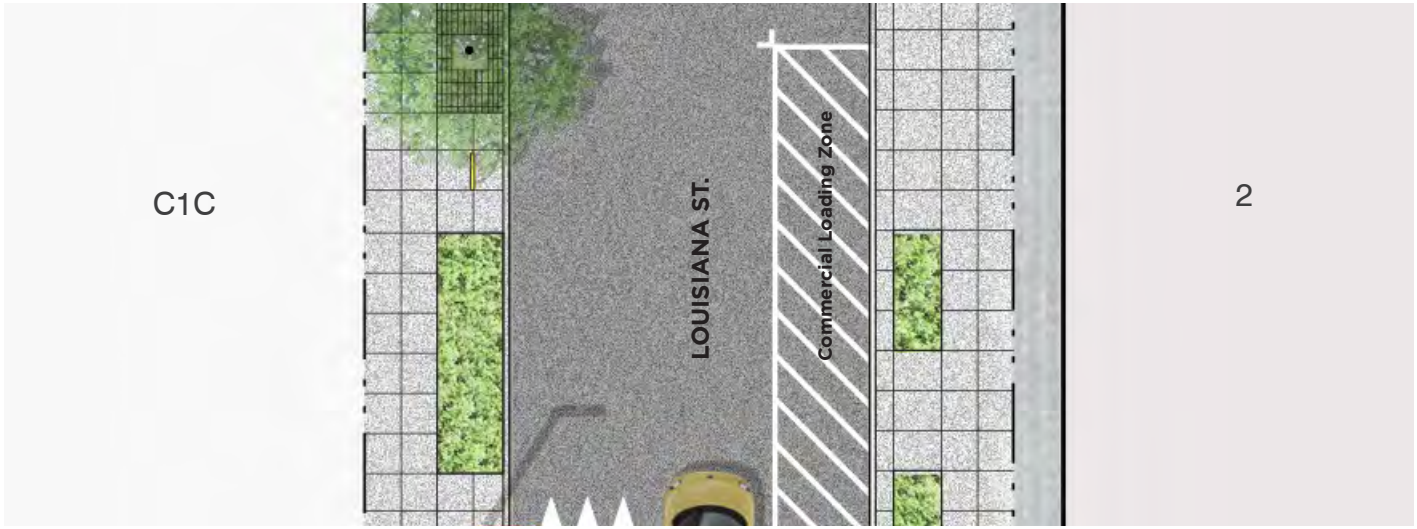
B - buffer
BLDG - building
L - loading
TW - throughway
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane

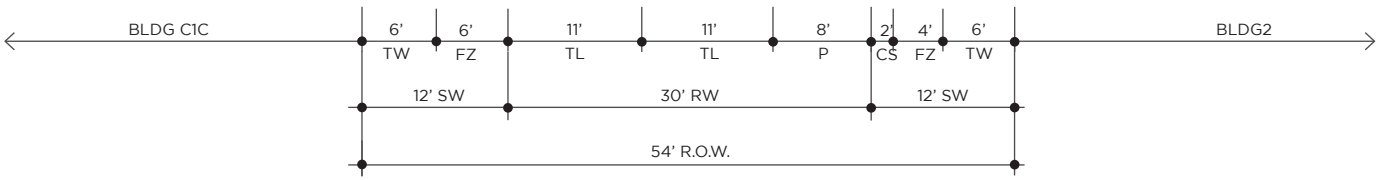
0 8' 16' 32'

LOUISIANA STREET SECTION - 2









BLDG - building
CS - courtesy strip
FZ - furnishing zone
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

0 8' 16' 32'

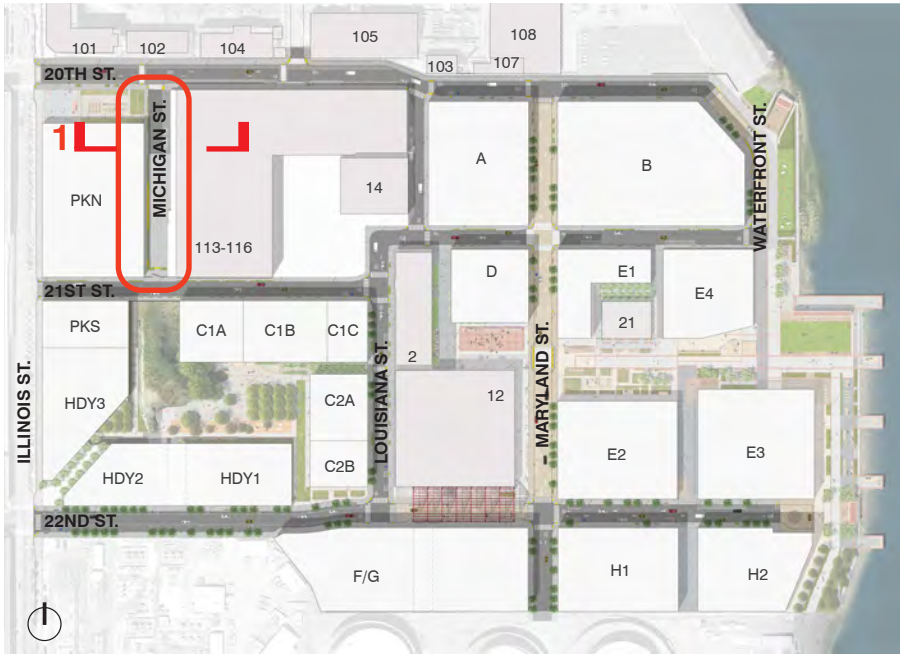
Pier 70
Remnant of Irish Hill

Photo Credit: Shae Rocco / Brookfield

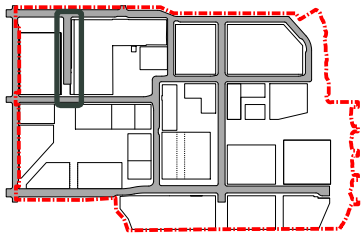
3.8 MICHIGAN STREET

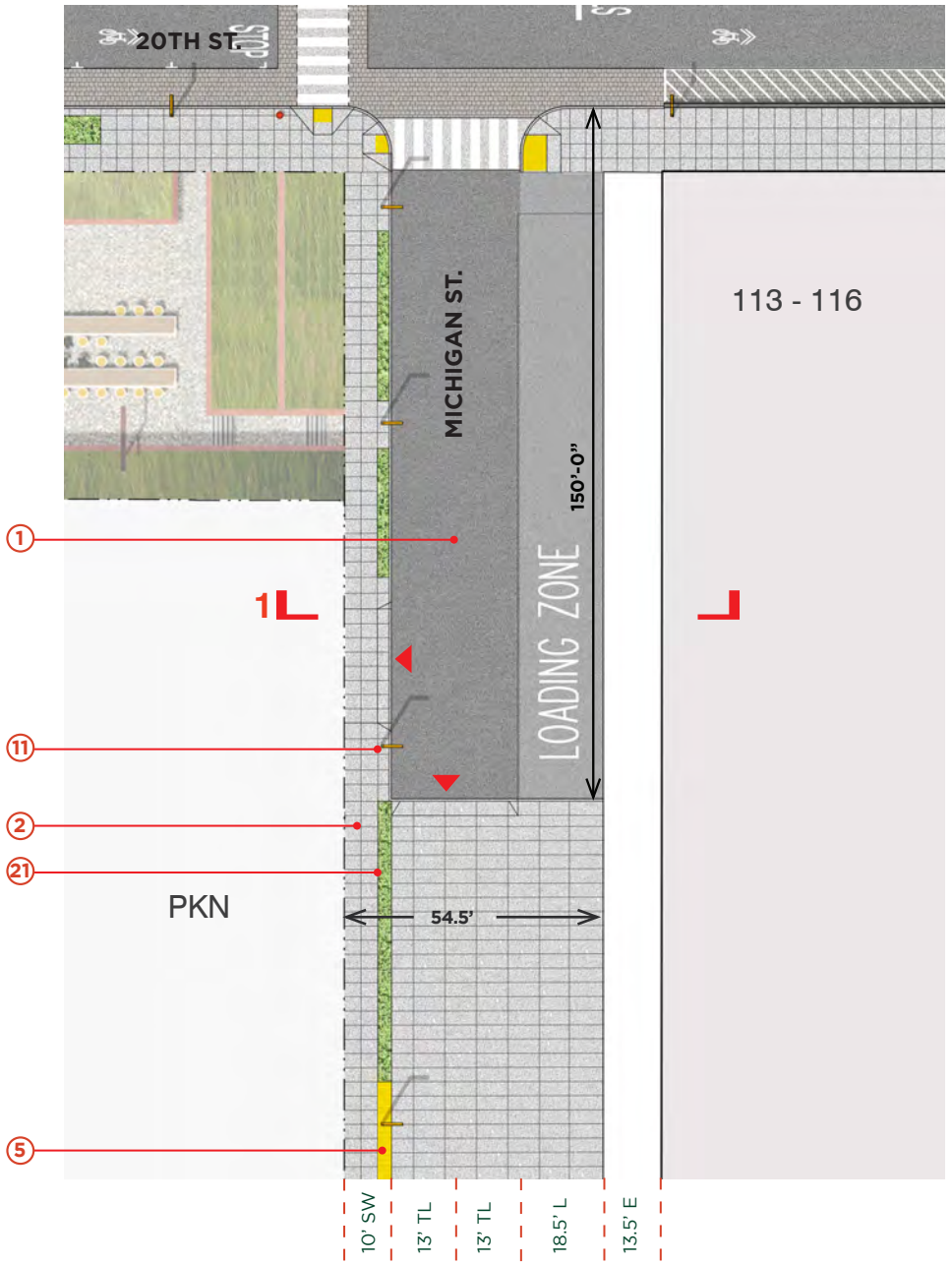
Michigan Street is an industrial alley intended to function as a service street for Buildings 113, 114, 115 and 116, as well as for the rear of Parcel K North residential parcel. Michigan Street will be vacated and retained as a Port Street, rather than dedicated to the City as a public right-of-way. Due to the active use of loading docks and driveways to facilitate truck movement, the sidewalk is only designed for pedestrian use on the west side of the street.

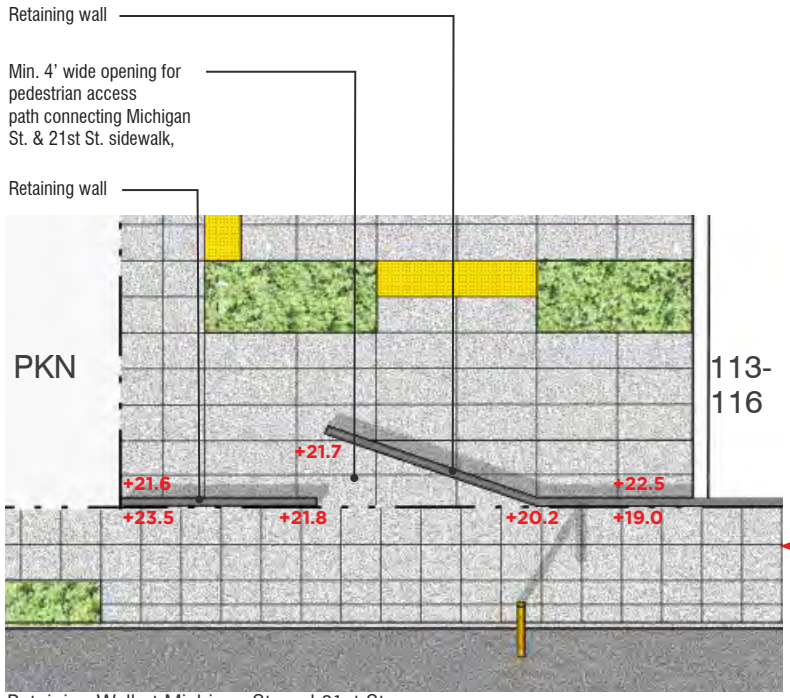
To address the emergency vehicle access, the design of Michigan Street will be revised by the developer of parcel PKN. As shown on the following pages, the street shall be designed to transform to a raised plaza or change in material after 150' from the corner of the 20th Street. An alternative design could include a 80' diameter cul-de-sac for the emergency vehicle turnaround.



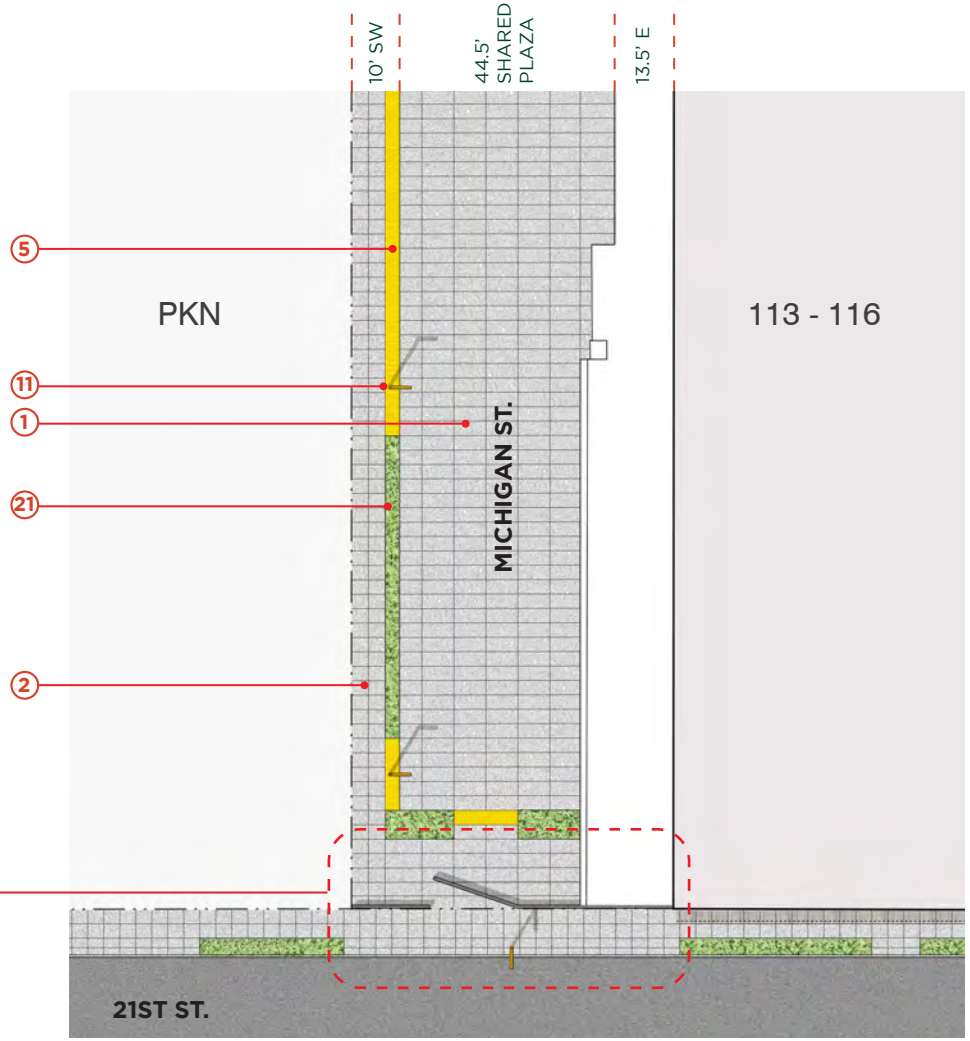
MICHIGAN STREET PLAN ENLARGEMENT







Retaining Wall at Michigan St. and 21st St.



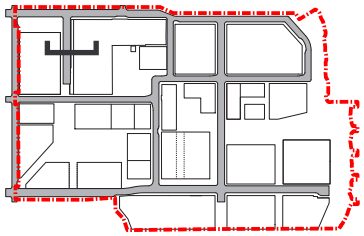
1 Roadway - Asphalt
2 Concrete Sidewalk
5 Warning Paver
11 Pole Light
21 Low Planting
▲ Driveway Curb Cut

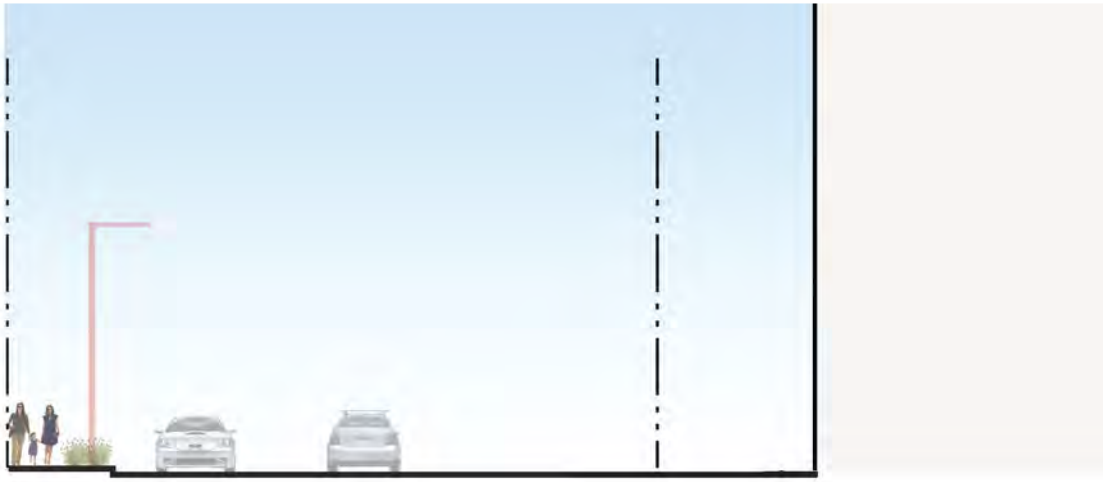
E- easement
L - loading
P - parking
SW - sidewalk
TL - travel lane

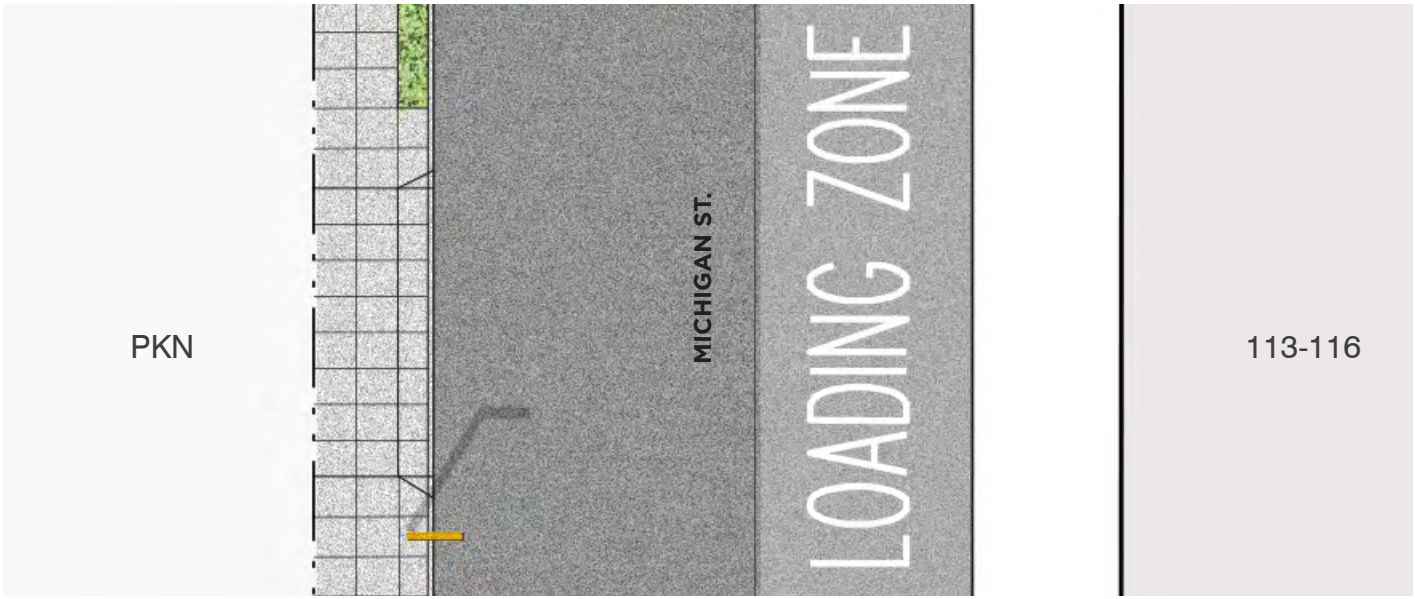
Note:
Refer to Master Material Palette on page 108 for more specific information on materials and products.

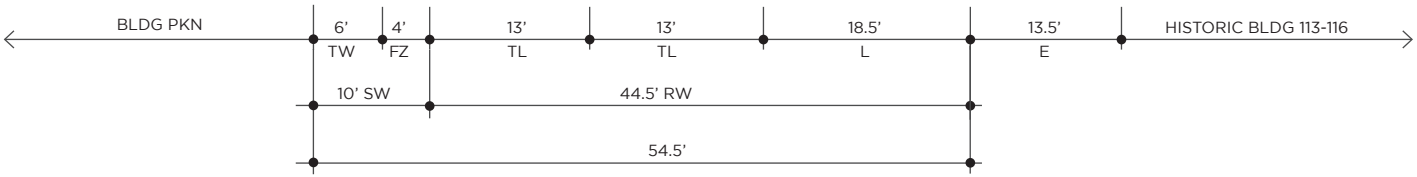
0 20' 40' 80'

MICHIGAN STREET SECTION - 1





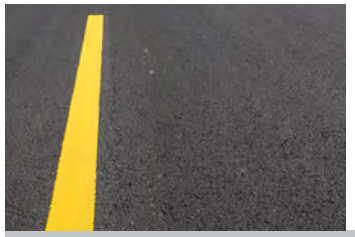




BLDG - building
E - easement
FZ - furnishing zone
L - loading
R.O.W. - right of way
RW - roadway
SW - sidewalk
TL - travel lane
TW - throughway

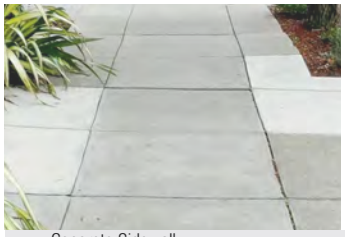
0 8' 16' 32'

3.9 MASTER MATERIAL PALETTE

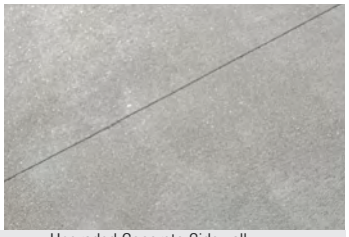


1 Asphalt Roadway: City Standard

1a Cobblestone (Reuse of Salvaged Existing Cobblestone underlying 20th St.)



2 Concrete Sidewalk:
SFPW Standard CIP Concrete

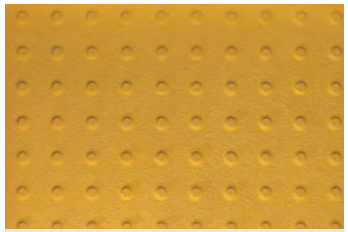


2a Upgraded Concrete Sidewalk
Finish - Silica Carbide / Sandblast

3 Integral Color Concrete Paving - Veh&Ped.
Color& finish to be coordinated with Bldg 12 Plaza Paving

4 Concrete Unit Pavers - Veh
Stepstone or equal | 6"x12" | Ground + Blasted Finish

4a Concrete Unit Pavers - Ped
Stepstone or equal | 6"x18" | Ground + Blasted Finish



5 Warning Pavers:
Tekway

6 Bay Trail Paving:
Impervious Concrete

6a Alternative Bay Trail Paving:
Porous Concrete

7 Tree Well Surfacing:
Cobblestone | 4x8 | Split Face

7a Alternative Tree Well Surfacing:
Cobblestone | 4x8 | Smooth Finish

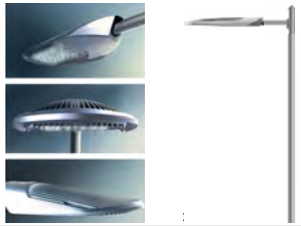
8 Tree Well Trunk Opening Mulch:
Black Basalt Crushed Stone

MASTER MATERIALS PALETTE (CONTINUED)

9 Motorcycle Parking With Multi-head Parking Meter

10 Traffic Island:
Fire Truck Accessible - Cobble Stone or Stone Slab

11 Pole Light:
Hess 'Linea 600 LED'



11a Alternative Pole Light:
Philips Lumec Roadfocus GPLM

12 Suspended Light:
Hess 'Village'

12 a Alternative Suspended Light:
Landscape Forms 'Arne'

13 Bollard Light:
Hess 'Linea S'

13a Alternative Bollard Light:
Louis Poulsen 'Bysted'

14 Fixed Bollard
MaxiForce, Standard Body, or equivalent

15 Removable Bollard: Collapsible by apparatus force
MaxiForce, Standard Body, or equivalent

MASTER MATERIALS PALETTE (CONTINUED)

16 Custom Bike Rack
Custom Steel Tee Bike Rack

16a Alternative Bike Rack:
Bikeparking.com 'Welle Circular Rack'

17 Bench:
Streetlife 'Drift Bench'

17a Bench:
Landscape Forms 'Bancal'

17b Alternative Bench:
Landscape Forms 'Multiplicity'

18 Litter + Recycling Receptacle:
Forms + Surfaces 'Dispatch'

18a Alt. Litter + Recycling Receptacle:
Landscape Forms 'Austin'

19 Barrier:
Streetlife 'Drift Bench'

19a Alternative Barrier:
Stone Block

Pier 70
Building 21

Photo Credit: Shae Rocco / Brookfield

4 UTILITIES

The streets are ultimately a negotiation between the requirements for civil engineering and the desire to provide occupiable public circulation space and landscape in the right-of-ways. Because landscape and infrastructure are intertwined, often sharing the same space, the quality of the streets is dependent upon rigorous coordination of sub-surface and surface utilities, trees, lighting, furnishing and paving. This chapter lays out the key civil engineering requirements that must be coordinated with the requirements for usable public outdoor space.

4.1 PERMITTING

4.1.1 DESIGN APPROVAL

As Acquiring Aqency, SFPW is the permitting agency for improvements within the public ROW. The Port and a number of other City agencies will provide review as well. All technical specifications for standard improvements not described in this document must meet pertinent SFPW Standards, Better Streets Plan guidelines and other applicable City requirements, and are subject to detailed design review and approval by SFPW, SFPUC and other relevant agencies.

4.1.2 UTILITY & ROADWAY DESIGN MODIFICATIONS / EXCEPTIONS

The project will follow the Subdivision Regulations and other applicable City standards and specifications. To the extent that there are deviations from those City requirements, a design modification or exception will be requested.

General design modifications and exceptions may include utility location relative to curbs, sidewalk width, and unique surface features to be independently-maintained (See Section 5.1.1).

Location-specific design modifications and exceptions potentially include the following:

- Geometry at 20th Street through Louisiana Street Intersection
- Single Sidewalk (east side of Louisiana Street North and east side of Michigan Street)
- Truck Loading Zone (west side of Louisiana Street and east side of Michigan Street)
- Non-Through Streets (22nd Street, Michigan Street)
- Building 15 Structural Frame over 22nd Street

4.2 UTILITIES CLEARANCE TO FACE OF CURB

Utilities generally maintain required clearance to curbs along the proposed street network, with exception to limited locations at bulb outs where separation from curbs to utility mains are reduced, and in locations where large diameter mains and/or the addition of the a combined sewer force main limit the project's ability to meeting clearance requirements. Exceptions to Subdivision Regulations and SFPUC Utility Standards will be identified in the Pier 70 Master Utility Plans. Utility sections are provided in the Pier 70 SUD Roadway & Utility Section Supplement.

4.3 UTILITY VAULT & BFP REQUIREMENTS

Backflow preventers for low pressure water, non-potable water/greywater systems, and fire protection system will be provided within mechanical rooms directly behind the property line or within basement garages. Utility structures such as combined sewer air release vents, water meters (low pressure water and non-potable water if applicable) will fall in project sidewalks.

Joint trench structures such as transformers and secondary boxes will also be provided in project sidewalks.

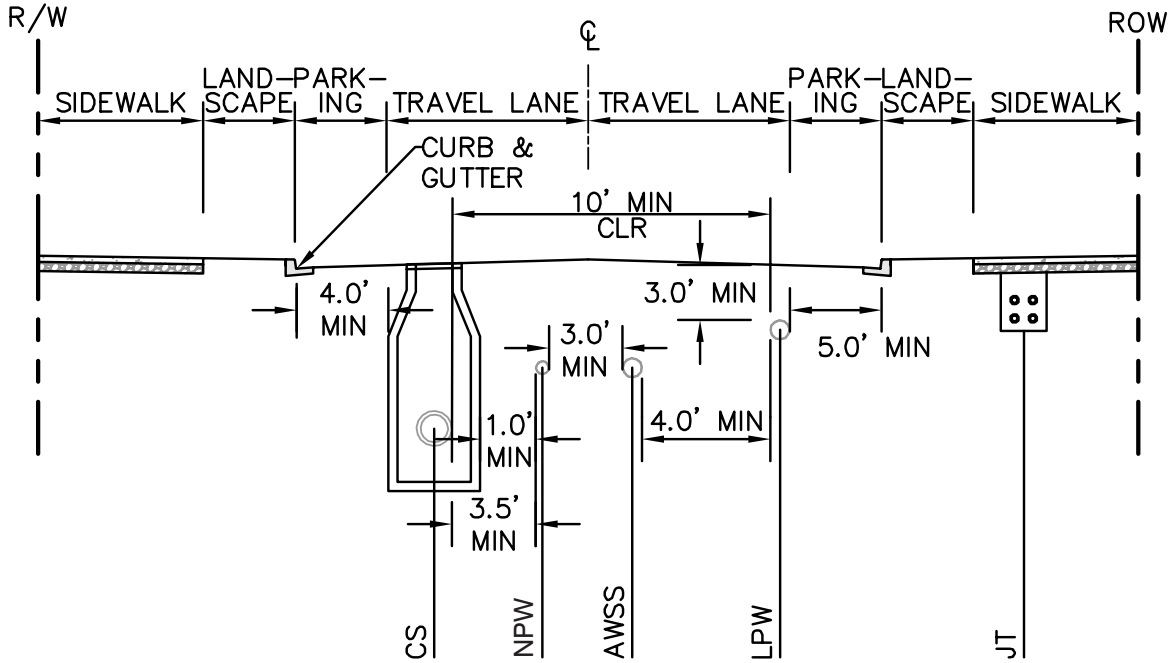


FIGURE 4.2.1: Typical Utility Cross Section* - NTS

*Note: Some utilities are not applicable for particular street segments.

4.4 UTILITIES & TREES

SFPUC requirements specify that trees must be planted a minimum of 5 feet from the edge of utility mains, laterals and appurtenances (such as vaults). Separation between trees and laterals will be documented in the project improvement plans.

Pier 70
Building 21

Photo Credit: Shae Rocco / Brookfield

5 MAINTENANCE & EASEMENTS

The Project streetscape includes many unique conditions that requires a thorough maintenance program. These unique conditions include the interface with open space and plaza areas, a high degree of quality of materials, flexible street closure areas to provide space for events, and special treatments that do not follow SFPW standards and therefore will not be maintained or restored by SFPW. Typically, the maintenance for streetscape improvements outside of City responsibility defaults to the fronting building owner. In order to provide a more comprehensive management approach and preserve the improvements in pristine condition, a thorough maintenance program has been devised as part of the larger open space program. First-rate maintenance of the streetscape elements is crucial to the success of the neighborhood and must be understood as an ongoing activity.

5.1 MAINTENANCE RESPONSIBILITIES

5.1.1 RESPONSIBLE PARTIES

Refer to Interagency Cooperation Agreement (ICA) section 4.6(c) for Streetscape Maintenance Responsibilities.

5.1.2 FUNDING SOURCE FOR STREETSCAPE MAINTENANCE

The City anticipates creating a perpetual Maintenance Community Facilities District (Maintenance CFD) for the project area. Maintenance special taxes levied against each taxable privately-owned and occupied parcel would provide pay-as-you-go funds for operations and maintenance costs of specified public infrastructure and facilities, including certain streetscape elements as desired.

In addition to the Maintenance CFD, Master CC&Rs may specify certain operation and maintenance obligations that will bind owners and occupants of each development parcels. These obligations would either be managed by a Homeowner's Association (HOA), Business Improvement District (BID), or Landscape & Lighting Improvement District (LLID).

A HOA would include a monthly assessment to offset the operating, reserve and administrative costs associated with the areas maintained by the Homeowners Association. In addition to the Homeowners Associations, certain private improvements outside of the public right-of-way may fall under the purview of building-specific homeowner associations, or sub-associations.

5.1.3 MAINTENANCE AREA

Due to varying ownerships on certain street frontages, the Project maintenance area does not correlate exactly to the SSMP Study Area boundary. The Independent Maintenance Entity (IME) will operate in the area consisting of the SSMP Study Area except for the streetscape areas behind the curb fronting the Historic Core. The building owners within the Historic Core will be responsible for maintaining their own streetscape frontages. The IME may be responsible for the maintenance of the frontages for the Illinois Parcels and PG+E switchyard, only if those building owners participate in the CFD, HOA, BID, or LLID.

5.1.4 MAINTENANCE AGREEMENT & LIABILITY

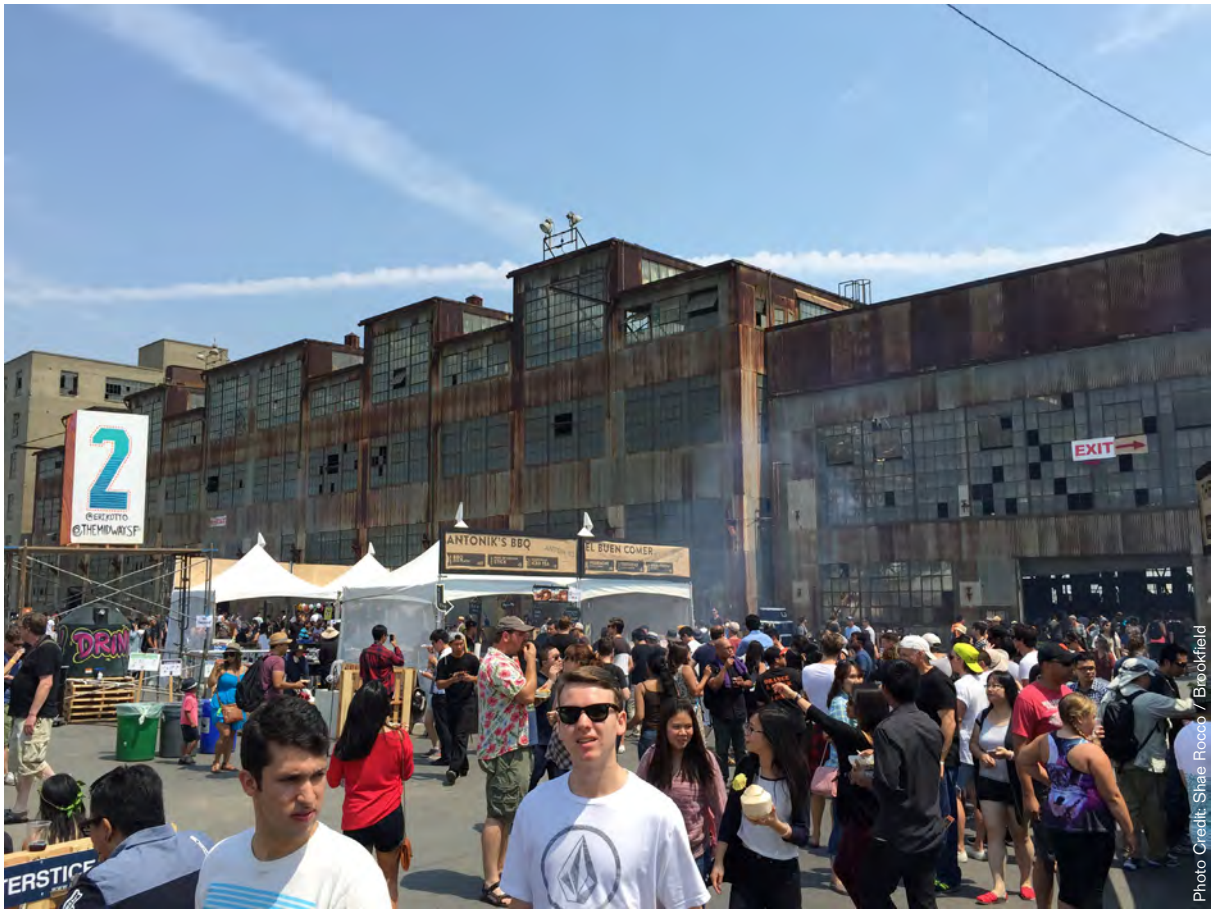
The Streetscape Maintenance Responsibility Matrix represents the framework for a Memorandum of Understanding (MOU) for the maintenance of the Pier 70 Project Site streetscape elements between the Developer, the San Francisco Department of Works, the San Francisco Public Utilities Commission, the Port of San Francisco, and other parties as necessary. This MOU will further define maintenance responsibilities for streetscape elements at the Pier 70 Project Site, including specifics on the frequency and list of tasks associated with each maintenance activity.

5.2 EVENT & STREET CLOSURES

MARYLAND STREET CLOSURE

Maryland Street between 21st and 22nd streets is anticipated to close to vehicular traffic for events and temporary programming. Events may include outdoor markets, street fairs and festivals, night markets, food events, art exhibits and street performances during weekdays and weekends. Typical events may occur several times a month, and larger-scale events may occur up to four times a year. Such street closures on Maryland Street are expected to be in effect for a duration ranging from a few hours up to an entire day.

At the time of street closure, event organizers must provide sufficient signage to route traffic through the site to minimize queuing and inefficient circulation. The recommended vehicular loop will be through 22nd street (west of Louisiana Street), Louisiana Street (South of 21st Street) and 21st street (west of Louisiana Street), with drop-off zones on Louisiana Street. 21st Street (east of Louisiana Street) may serve as a loading/service alley for the events.



Street Food Festival in front of Building 12

5.3 EASEMENT & ENCROACHMENTS

5.3.1 EASEMENTS

Public Access Easements will be recorded over private lanes, which provide additional loading and circulation within the Project Site.

5.3.2 ENCROACHMENTS

There may be private facilities to be located within the public right-of-way requiring a Major Encroachment from the City. Encroachments potentially include but are not limited to the existing buildings within the 20th Street right-of-way (Building 104, Building 105, and the Building 113), existing and proposed retaining walls as identified in Section 2.2.2, the Structural Frame, and private microgrid for renewable power distribution. The Developer will submit a major encroachment permit application in accordance with the SFPW specified process accompanied by plans showing the design, location, nature of the encroachment and other pertinent information sufficient to enable the various City agencies to evaluate the effect of the encroachment as it relates to their appropriate rules and regulations.

APPENDIX A

APPROVAL OF PIER 70 SUD STREETSCAPE MASTER PLAN

February 27, 2019

FC Pier 70, LLC
875 Howard St., Ste. 330
San Francisco, CA 94103

ATTN: Jack Sylvan, Jack.Sylvan@brookfieldpropertiesdevelopment.com

RE: Approval of Streetscape Master Plan for the Pier 70 Special Use District

Dear Jack,

The Port and other City Agencies have completed review of the Streetscape Master Plan for the Pier 70 Special Use District pursuant to Section 3.5 of the Disposition and Development Agreement between the Port and FC Pier 70, LLC and Section 4.7 of the Interagency Cooperation Agreement between the Port and the City. The Port hereby approves the Streetscape Master Plan, subject to any conditions set forth in the attached consent letters from the other City Agencies.

Regards,

Elaine Forbes
Executive Director

Attachments:

1. San Francisco Municipal Transportation Agency consent letter dated February 27, 2019
2. Public Works consent letter dated February 28, 2019
3. Public Utilities Commission consent email dated February 11, 2019
4. Planning Department approval letter dated February 5, 2019
5. Fire Department approval letter dated February 5, 2019

February 27, 2019

Kevin Masuda
Project Manager
Port of San Francisco
Pier 1, San Francisco, CA 94111

Subject: Review of Pier 70 Special Use District Streetscape Master Plan

Dear Mr. Masuda,

This is to confirm that the SFMTA has completed a review of the Pier 70 SUD Streetscape Master Plan (SSMP) and all final comment responses and found them to meet the intent of all relevant SFMTA regulations and design guidelines.

This letter serves as written notice that the SSMP is approved and may be used as the basis for future design development.

By approving the above-listed documents, SFMTA does not intend to limit, waive, or delegate in any way its exclusive authority under Article VIIIA of the Charter.

Subject to the procedures established in the Interagency Cooperation Agreement (ICA) and notwithstanding Government Code Section 66456.2(a), the infrastructure design contained herein is acceptable and may be permitted accordingly.

Sincerely,

Carli Paine,
Manager, Land Use Development and Transportation Integration

cc: Daniel Paddila, SFMTA
James Shahamiri, SFMTA
Mike Sallaberry, SFMTA
Forrest Chamberlain, SFMTA

Attachment A: SFMTA Conditions of Approval

Attachment A: Conditions of Approval for Pier 70 Special Use District Streetscape Master Plan

By form of this letter, the Streetscape Master Plan document is conditionally approved contingent that outstanding design issues will be resolved and documented through upcoming Improvement Plans and other relevant documents that form the basis of construction permits.

1. The Streetscape Master Plan shall not determine the final design of proposed infrastructure for construction. The sponsor shall continue to work in close consultation with SFMTA and other relevant city agencies to finalize detailed infrastructure design that meets City standards and guidelines during the review of Street Improvement Plans, Tentative Maps, and similar documents that are currently under review or yet to be developed. As such, infrastructure design as proposed in the Streetscape Master Plan may be subject to adjustments as necessary to resolve any design or other issues that are not in accordance with SFMTA standards and guidelines. The final design of proposed infrastructure established in the Improvement Plans shall supersede that of the Streetscape Master Plan, which will remain a conceptual document.
2. Detailed infrastructure design for portions of the site that have not been included in the Phase 1 Improvement Plans, including but not limited to segments of 20th Street, 21st Street, Waterfront Street, and 22nd Street, shall be subject to future SFMTA review and approval.
3. The Sponsor shall continue to work closely with SFMTA, Public Works, SFPUC, and the Planning Department to resolve any design issues and to coordinate construction timelines.
4. Signage and striping details shall be subject to SFMTA approval through the review of Improvement Plans or similar documents.
5. The Port shall work closely with the SFMTA on all striping, parking, and signage changes on Illinois Street between 20th and 22nd streets, including for the northern segment under the Port's jurisdiction. Such changes require SFMTA approval, and the Port and Sponsor shall conduct outreach, in coordination with SFMTA, to adjacent property owners who will be impacted by changes to parking regulations.
6. The location and design of bicycle racks/corrals shall be subject to a later SFMTA approval. Non-standard bicycle racks/corrals shall be reviewed and approved by SFMTA for conformance with bicycle facility standards and guidelines.
7. Proposed non-standard roadway conditions that do not conform to Subdivision Regulations shall require approval of exceptions to the Subdivision Regulations including review and approval of SFMTA.
8. The Sponsor shall design and construct required signal modifications and new traffic signals at the intersections of Illinois and 20th, 21st, and 22nd streets per SFMTA standards and requirements. The Sponsor shall be responsible for all SFMTA costs of review.
9. The Port shall be responsible for the designation and legislation of curb uses for any portion of the street that falls under the Port's jurisdiction, while SFMTA retains authority over curb use for any portion of any street that is City (as opposed to Port-or-project) owned. For Port jurisdiction, the Port shall consult with the SFMTA Color Curbs Program on curb use designation to ensure consistency with City curb use policy during the vertical development design process. Curb designations within the City's jurisdiction shall be subject to review and approval by the SFMTA Color Curb Program. SFMTA and the Port shall create a Curb Management Plan that balances demand for passenger loading, commercial loading, accessible parking, and on-street parking spaces

while reducing hazards of double parking.

10. All construction shall be in accordance with the SFMTA Regulations for Working in San Francisco Streets (Blue Book, January 2012, 8th Edition with updated contact information as of 2016, or any successor version of this document) and the California Manual on Uniform Traffic Control Devices. When applying for a Public Works street space permit for any work on the sidewalk or roadway, construction plans shall be presented to SFMTA Transportation Engineering staff for review and approval.

SAN FRANCISCO PUBLIC WORKS

London N. Breed
Mayor

Mohammed Nuru
Director

Jerry Sanguinetti
Manager

Street Use and Mapping
1155 Market St., 3rd floor
San Francisco, CA 94103
tel 415-554-5810

sfpublicworks.org
facebook.com/sfpublicworks
twitter.com/sfpublicworks

February 28, 2019

Kevin Masuda
Project Manager
Port of San Francisco
Pier 1, San Francisco, CA 94111

Subject: Review of Pier 70 Special Use District (SUD) Streetscape Master Plan (SSMP)

Dear Mr. Masuda:

I am confirming that San Francisco Public Works (SFPW) has completed review of the Pier 70 SUD Streetscape Master Plan. Whereas the SSMP is a conceptual document, SFPW confirms that the plan meets most of the regulations and design criteria except as noted below. This letter serves as conditional approval from SFPW and that the SSMP can be used as one of the elements for the basis of future design development.

Through this conditional approval, SFPW does not intend to limit, waive, or delegate in any way its authorities under the Charter.

Subject to the procedures established in the Interagency Cooperation Agreement (ICA) and notwithstanding Government Code Section 66456.2(a), the infrastructure design contained herein is conditionally acceptable and may be permitted accordingly. Subject to the following:

1. The project area must conform to Public Works Order 185,854 Accessible Street Crossing Standard. Unless otherwise allowed or authorized under the D4D.

2. Shared use path along 20th Street: Driveway curb cuts for bicycle and/or vehicle use shall not reduce the clear width of the designated pedestrian route along the shared use path to less than 4 feet in clear width, in accordance with the California Building Code and the SF Better Streets Plan.

Please contact me if you have any questions.

Sincerely,

Barbara L. Moy

Barbara L. Moy
Manager, Infrastructure Task Force

cc: John Kwong, SF Public Works
Javier Rivera, SF Public Works

From:	Adams, Derek S
To:	Bryce Wilson; Petrick, Molly (PUC)
Cc:	Masuda, Kevin (PRT); Ryan Bernal; Gary Strang; Xiaoye Zhang; Josh Bardet; Cliff Ritz; Catherine Reilly; David Greenstein
Subject:	RE: Pier 70 Final Streetscape Master Plan - Response to Comments
Date:	Monday, February 11, 2019 4:53:06 PM
Attachments:	image001.png

Hey Bryce,

These responses sound good, I believe are comments are getting addressed – we just ask that the final SSMP with these changes be sent to us for one last look.

Thanks,

Derek

From: Bryce Wilson <bwilson@lotuswater.com>
Sent: Monday, February 11, 2019 2:53 PM
To: Adams, Derek S <DSAdams@sfwater.org>; Petrick, Molly <MPetrick@sfwater.org>
Cc: Masuda, Kevin (PRT) <kevin.masuda@sfport.com>; Ryan Bernal <rbernal@bkf.com>; Gary Strang <gary@glsarch.com>; Xiaoye Zhang <Xiaoye@glsarch.com>; Josh Bardet <jbardet@hollinsconsult.com>; Cliff Ritz <Cliff.Ritz@brookfieldrp.com>; Catherine Reilly <Catherine.Reilly@brookfieldpropertiesdevelopment.com>; David Greenstein <David.Greenstein@brookfieldpropertiesdevelopment.com>
Subject: RE: Pier 70 Final Streetscape Master Plan - Response to Comments

Hello Derek,

I understand that SFPUC will not be providing a consent letter for the Pier 70 SSMP, however the Port and development team would appreciate if you could confirm that the final SFPUC comments have been addressed by the attached responses.

Thank you,

Bryce Wilson
SENIOR PROJECT MANAGER – PE, QSD

415.939.3762 (m)

From: Bryce Wilson
Sent: Friday, February 1, 2019 10:29 AM
Subject: Pier 70 Final Streetscape Master Plan - Response to Comments

Hello City reviewers,

The Pier 70 SUD design team is pleased to submit the responses to comments on the SSMP for your final review. All comments received on the September 2018 SSMP have been addressed and a great

majority of the comments were already addressed in the improvement plans since we are running both approval processes concurrently.

The SSMP is a prerequisite for the approval of the Pier 70 Phase 1 improvement plan that we anticipate being approved in the next week. As a result, we request your assistance with a quick review of the attached responses to comments so the Port can finalize its approval of the SSMP. Once everyone has reviewed and agreed to the responses, the SSMP will be updated and a final document printed and distributed to the various agencies for your use going forward.

While the ICA gives the Port sole responsibility for the approval of the final SSMP, to ensure that we document the City Agencies review per the ICA, we request that you review the responses to comments and return the matrix with your agreement on resolution for each comment generated by your department by February 5, 2019. If you have a concern about any of the proposed responses, please let us know as soon as possible so that we can address your comments quickly to finalize the document.

If you find these comment responses acceptable, we request that you return a consent form (template attached) as a record of Department approval of the SSMP.

Brookfield and the Port are available to meet and discuss the SSMP at any time. Should you have any questions, please do not hesitate to contact us.

Thank you,

Bryce Wilson
Lotus Water

660 MISSION STREET, 2ND FLOOR, SAN FRANCISCO, CA 94105
415-939-3762 | bwilson@lotuswater.com | www.lotuswater.com

From: Masuda, Kevin (PRT)
Sent: Wednesday, November 28, 2018 9:48 AM
To: Fisher, Lisa (CPC); Perry, Nicholas (CPC); Kwong, John (DPW); Rivera, Javier (DPW); Buck, Chris (DPW); Jensen, Kevin (DPW); Shahamiri, James (MTA); Chamberlain, Forrest (MTA); Larano, Samuel (PUC); Freeman, Craig (PUC); Parhar, Ranjit (PUC); Cofflin, Ken (FIR)
Cc: Masuda, Kevin (PRT); Maher, Christine (PRT); Benson, Brad (PRT); Greenstein, David; DiTullio, Dominic; Dennis-Phillips, Sarah (ECN); Moy, Barbara (DPW); Markowitz, Frank (MTA); Petrick, Molly (PUC); Adams, Derek (PUC); Sucre, Richard (CPC); Beaupre, David (PRT); Switzky, Joshua (CPC); Sider, Dan (CPC); Jones, Sarah (MTA); Sanguinetti, Jerry (DPW); Havens, Robin (ECN); Benassini, Rebecca (PRT)
Subject: RE: ED 17-02 - Pier 70 Final Draft Streetscape Master Plan - Review Due Date October 31, 2018 - REMINDER

Hello All,

Please find attached the consolidated comments on the final Pier 70 Streetscape Master Plan. If you

find this master planning document acceptable, please send separately your Department's approval to me. As always, please feel free to contact me with any questions or comments. Thank you!

Kevin Masuda
Project Manager

Port of San Francisco
415.274.0585
www.sfport.com

Pier 1, San Francisco, CA 94111

From: Reilly, Catherine [mailto:CatherineReilly@forestcity.net]
Sent: Monday, October 22, 2018 7:23 PM
To: Fisher, Lisa (CPC); Perry, Nicholas (CPC); Kwong, John (DPW); Rivera, Javier (DPW); Buck, Chris (DPW); Jensen, Kevin (DPW); Shahamiri, James (MTA); Chamberlain, Forrest (MTA); Larano, Samuel (PUC); Freeman, Craig (PUC); Parhar, Ranjit (PUC); Cofflin, Ken (FIR)
Cc: Masuda, Kevin (PRT); Maher, Christine (PRT); Benson, Brad (PRT); Greenstein, David; DiTullio, Dominic; Dennis-Phillips, Sarah (ECN); Moy, Barbara (DPW); Markowitz, Frank (MTA); Petrick, Molly (PUC); Adams, Derek (PUC); Sucre, Richard (CPC); Beaupre, David (PRT); Switzky, Joshua (CPC); Sider, Dan (CPC); Jones, Sarah (MTA); Sanguinetti, Jerry (DPW); Havens, Robin (ECN); Benassini, Rebecca (PRT)
Subject: RE: ED 17-02 - Pier 70 Final Draft Streetscape Master Plan - Review Due Date October 31, 2018 - REMINDER

Thank you again for reviewing the Pier 70 Streetscape Master Plan. As a reminder, comments are due to Kevin Masuda by October 31, 2018. If you have already turned in your comments, thank you for the quick review!

Catherine Reilly
Development Director

Forest City Realty Trust, Inc.
875 Howard Street, Suite 330
San Francisco, CA 94103

Direct: 415-593-4241
Main: 415-836-5980
catherinereilly@forestcity.net

From: Reilly, Catherine
Sent: Monday, October 01, 2018 9:08 PM
To: Fisher, Lisa (CPC); Perry, Nicholas (CPC); Kwong, John (DPW); Rivera, Javier (DPW); Buck, Chris

(DPW); Jensen, Kevin (DPW); Shahamiri, James (MTA); Chamberlain, Forrest (MTA); Larano, Samuel (PUC); Freeman, Craig (PUC); Parhar, Ranjit (PUC); Cofflin, Ken (FIR)
Cc: Masuda, Kevin (PRT); Maher, Christine (PRT); Benson, Brad (PRT); Greenstein, David; DiTullio, Dominic; Dennis-Phillips, Sarah (ECN); Moy, Barbara (DPW); Markowitz, Frank (MTA); Petrick, Molly (PUC); Adams, Derek (PUC); Sucre, Richard (CPC); Beaupre, David (PRT); Switzky, Joshua (CPC); Sider, Dan (CPC); Jones, Sarah (MTA); Sanguinetti, Jerry (DPW); Havens, Robin (ECN); Benassini, Rebecca (PRT)
Subject: ED 17-02 - Pier 70 Final Draft Streetscape Master Plan - Review Due Date October 31, 2018 -

Dear City Reviewers – We are excited to submit what we anticipate being the final version of the Pier 70 Streetscape Master Plan for your final review and approval. Per the ICA, we appreciate your review within in the 30 day period, ending on October 31, 2018. If you have any questions, please contact Kevin Masuda at the Port or myself.

Please see the attached cover letter for additional information and a list of people that will be receiving a hard copy of the Streetscape Master Plan tomorrow. Links to the electronic version of the Streetscape Master Plan and Appendix are provided below. If you are not on the list for hard copies of the SSMP and would like to receive one, or if you would like to receive a hard copy of the Appendix, please let me know. We will also be sending out a form letter later this week for your use to document your review/approval of the SSMP for final Port approval.

Link to 9/10/18 Streetscape Master Plan -
https://www.dropbox.com/s/ioqk1h7o6clgnmq/Pier%2070%20SUD%20SSMP%20final%20092018.pdf?dl=0
Link to 9/10/18 SSMP Appendix - Vehicle Turning Radius Study -
https://www.dropbox.com/s/jt2l6nlbc06p5ej/18_1001-Pier%2070%20Vehicle%20Turning%20Supplement-Compiled.pdf?dl=0

Thank you

*Please note that this request supports the implementation of the Pier 70 SUD project, which is named as one of the City's priority projects in Executive Directive 17-02. We request that you please let the Housing Coordinator for your department listed below know that you are working on this request so they can keep track of efforts to implement ED 17-02.

Catherine Reilly
Development Director

Forest City Realty Trust, Inc.
875 Howard Street, Suite 330
San Francisco, CA 94103

Direct: 415-593-4241
Main: 415-836-5980
catherinereilly@forestcity.net

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

February 5, 2019

Kevin Masuda
Project Manager
Port of San Francisco
Pier 1, San Francisco, CA 94111

Subject: Review of Pier 70 Special Use District Streetscape Master Plan

Dear Mr. Masuda,

This is to confirm that the San Francisco Planning Department has completed a review of the Pier 70 SUD Streetscape Master Plan (SSMP) and all final comment responses and found them to meet the intent of all relevant San Francisco Planning Department regulations and design guidelines.

This letter serves as written notice that the SSMP is approved and may be used as the basis for future design development.

By approving the above-listed documents, San Francisco Planning Department does not intend to limit, waive, or delegate in any way its exclusive authority under Article VIIIA of the Charter.

Subject to the procedures established in the Interagency Cooperation Agreement (ICA) and notwithstanding Government Code Section 66456.2(a), the infrastructure design contained herein is acceptable and may be permitted accordingly.

Sincerely,

Nicholas Perry
Principal Planner & Urban Designer

cc: Lisa Fisher
Joshua Switzky

PORT OF SAN FRANCISCO

Pier 1, San Francisco, California 94111
Port Fire Marshal
Captain Ken Cofflin
(415) 274-0565

February 5, 2019

Kevin Masuda
Project Manager
Port of San Francisco
Pier 1, San Francisco, CA 94111

Subject: Review of Pier 70 Special Use District Streetscape Master Plan

Dear Mr. Masuda,

This is to confirm that the San Francisco Fire Department has completed a review of the Pier 70 SUD Streetscape Master Plan (SSMP) and all final comment responses (dated 1/30/2019) and found them to meet the intent of all relevant San Francisco Fire Department regulations and design guidelines.

This letter serves as written notice that the SSMP is approved and may be used as the basis for future design development.

By approving the above-listed documents, the San Francisco Fire Department does not intend to limit, waive, or delegate in any way its exclusive authority under Article IV, Section 4.128 of the San Francisco Charter.

Subject to the procedures established in the Interagency Cooperation Agreement (ICA) and notwithstanding Government Code Section 66456.2(a), the infrastructure design contained herein is acceptable and may be permitted accordingly.

Sincerely,

Capt. Ken Cofflin
Port Fire Marshal
San Francisco Fire Department

APPENDIX B

PIER 70 SUD VEHICULAR TURNING SUPPLEMENT

FINAL

September 10, 2018

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TABLE OF CONTENTS

FIGURES

ATTACHMENTS

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1. INTRODUCTION

This Pier 70 SUD Vehicular Turning Supplement is an appendix to the Pier 70 SUD Streetscape Master Plan (SSMP) for approval as part of that document. The Vehicle Turning Supplement includes turning studies for various vehicles including emergency vehicles, buses, commercial shuttles, and commercial vehicles.

2. ANALYSIS

Project Streets are pedestrian activity streets and are generally designed for SU-30 vehicles and to accommodate WB-40 vehicles. There are six isolated locations within the project site where, due to lack of curb side parking to buffer truck turning, the site plan has been modified to create curblines with compound radii to provide for the SU-30 turning movement. At four of these locations, the building corners were also chamfered to a depth of up to 4' to further enhance the turning movement while maintaining the full sidewalk width. At two of these locations, the SU-30 turning is accommodated through a minor encroachment of up to 1'-8" into the opposing lane. See Figure 1 for location of curb returns with compound radii and Attachment A for detailed studies at these locations.

The project will include two areas posted for reduced speed as shown in Figure 1. The first will be on 20th Street at the Waterfront, which will have a centerline radius of 100 feet based on AASHTO –Geometric Design of Highways and Streets, 6th Edition guidelines for minimum radii for Low Speed Urban Streets. The centerline radius is based on recommendations for 20 MPH travel speed, however it will be posted at 15 MPH. The second area will be posted at 5 MPH due to the geometry of the streets around Historic Core project.

Vehicles studied in this supplement are based on information from the San Francisco Fire Department (SFFD) as well as additional studies provided to ensure that SFMTA and commercial site uses can be supported by the roadway network included in the project proposal.

The SFFD has provided three vehicle templates for analysis on projects, including a 30' long engine truck (FE-30), a 34' long engine/rescue truck (FE-34) and a 57' long articulated Ladder Truck. The FE-30 and FE-34 vehicles are similar in size and turning capabilities. The FE-34 is slightly longer and more restrictive as shown in Figure 2, therefore, turning studies for the FE-34 will satisfy requirements for the FE-30 and are included in Attachment B to this supplement. Generally, the ladder truck dictates intersection geometry, turning studies for the ladder truck are included in Attachment C.

Unobstructed width in all streets is at least 20 feet and in some streets is 26 feet or more. In limited locations where a street with unobstructed width of less than 26 feet fronts an entrance to building other than Construction Type 1, a minimum 100' localized fire access zone has been designed to provide the minimum 26 feet unobstructed width. These areas will have wide enough clear space for emergency vehicles to pass each other and set up operations at the front entrance of their respective building. The location of this localized fire access zone is shown on Figure 2.5.1 of the SSMP. Turning movements have been studied for the localized fire access zones located in front of Buildings E-2 and 12 near the intersection of Maryland and 22nd Streets to ensure that adequate space is provided, studies for the FE-34 are included in Attachment B and studies for the ladder truck are included in Attachment C. Additionally, there are two locations where fire access will be provided within open space or a private lane. One location is between Buildings E1 and E2 (to provide access to Building 21), the other between Buildings E2 and E3. Per specific request from SFFD, a study is included (page 60 of Attachment B) to show that while a

ladder truck is staged in front of Buildings 21 in the open space, an FE34 truck will be able to pass and continue to exit the open space through the EVA located between Buildings E2 and E3. These locations are also shown on Figure 2.5.1 and turning studies are also published in Attachments B and C for each respective vehicle.

In addition, a route has been studied to ensure that SFMTA MUNI buses may enter and exit the site on 22nd Street and turn onto Maryland Street in the southbound direction, which will connect to a future development at the Former Potrero Power Plan site, south of the Pier 70 SUD. This route is shown on Figure 3, turning studies showing this movement are included as Attachment D. Bulbouts will be required for future MUNI stops and are shown diagrammatically on Figure 2-4 and on turning figures at Maryland and 22nd included in Attachments B, C, and D. The bulbouts in locations requested by SFMTA have been included in this supplement as potential future improvements. Feasibility of the bulbout on 22nd has been determined to be feasible and will be included as part of Phase 1 improvements. Feasibility of bulbout on Maryland Street will be studied in the future to confirm that addition of bulbout will allow continued use by design and emergency vehicles as required by SFMTA and SFFD. Implementation may require modification to the roadway such as compound radii at curb returns, recessed stop bar(s) at the intersection, or relocation of the bulbouts to a midblock location. MUNI stops will be added just prior to commencement of the MUNI bus route or with the last phase, whichever is earlier, and not necessarily with the phase in which they are located. SFMTA must notify the Developer at least 12 months prior to start of service to ensure adequate time for design and installation.

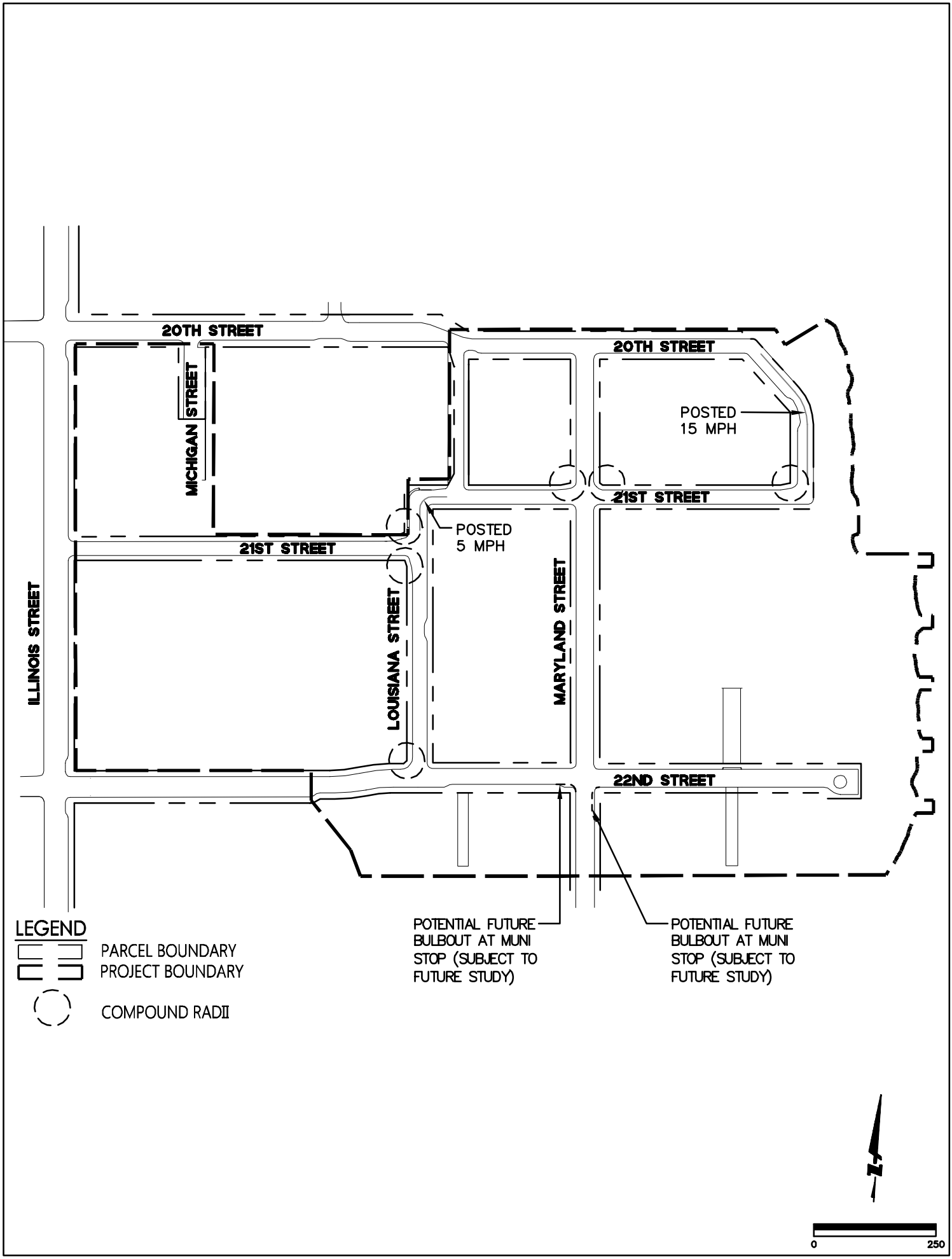
The bus template used is also studied to ensure that commercial shuttles operated by the project Transit Management Agency (TMA) can navigate through the site, entering on 22nd Street, turning onto northbound Maryland Street, and westbound onto 20th Street to ultimately exit the site. In addition, an alternative route may be needed when Maryland Street between 20th and 21st Streets is closed for events. The alternative route enters on 22nd Street, turning onto northbound Louisiana Street, and westbound onto 21st Street to exit the site. These routes are shown on Figure 4, turning studies showing this movement are included as Attachment E.

Commercial trucks larger than SU-30 and up to and including WB-40 can be accommodated on site with assistance, such as flaggers and loading attendants. The frequency of deliveries with large trucks east of Louisiana Street is anticipated to be low based on the intended land uses. The programming in the RALI buildings in this area such as Buildings 21 and E4 consist more heavily of retail and arts. Truck deliveries to commercial buildings will be on a routine, predictable schedule and can be controlled by the building manager. The Developer will prepare a Driveway and Loading Operations Plan (DLOP) to reduce potential conflicts between truck access, pedestrians, bicycles and vehicles. The DLOP would include a set of guidelines related to required truck routing, size restrictions, assisted guidance by flagger for difficult turning maneuvers, securing areas of conflict before truck movement, vehicular access restrictions during delivery operations, operation of driveways into the loading facilities, loading/unloading procedures and time limits, permitting for curbside loading activities, and would specify driveway attendant responsibilities. The Developer will submit the DLOP for review and approval by the Planning Department and the SFMTA. As appropriate, the DLOP could be periodically reviewed by the Planning Department and SFMTA and revised if feasible to more appropriately respond to changes in street or circulation conditions.

In addition, to allow for continued commercial uses at the Historic Core, a truck route has been provided to allow for larger commercial vehicles (WB-50) to access 20th and Louisiana Street, and exit the site at 22nd Street. WB-50 trucks will be subject to DLOP requirements. The route for the WB-50 truck is shown on Figure 5 and turning studies showing these movements are included as Attachment F.

3. CONCLUSION

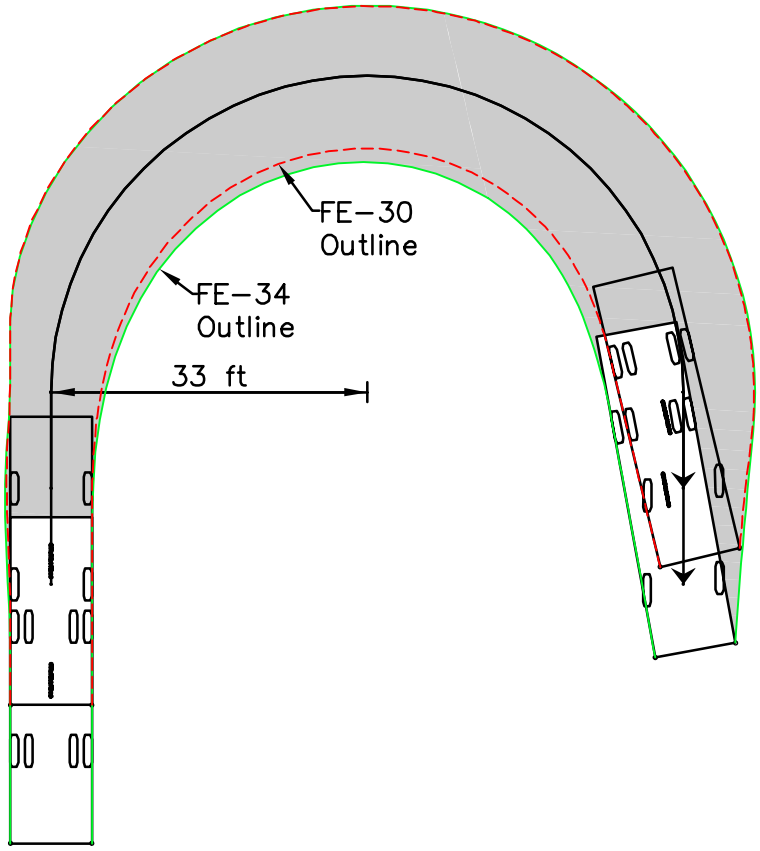
The Project street grid has been analyzed and reflects the requirement for the intended uses while also complying with requirements for emergency responders. Commercial truck access will be subject to the DLOP requirements.



DRAWING NAME: \\Bkf-rc\data\Eng13\130162\Exhibits\Truck Turning\Figures\Figure 1-Site Modifications.dwg
PLOT DATE: 10-01-18 PLOTTED BY: sade

PIER 70 SUD VEHICULAR TURNING SUPPLEMENT

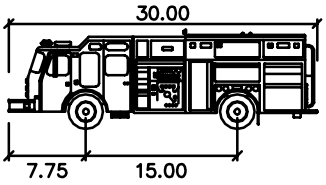
FIGURE 1: CURB MODIFICATIONS AND REDUCED SPEED AREAS



LEGEND

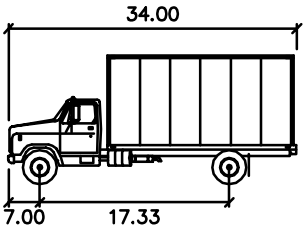
FE–30 Fire Engine Outline

FE–34 Fire Rescue Squad Outline



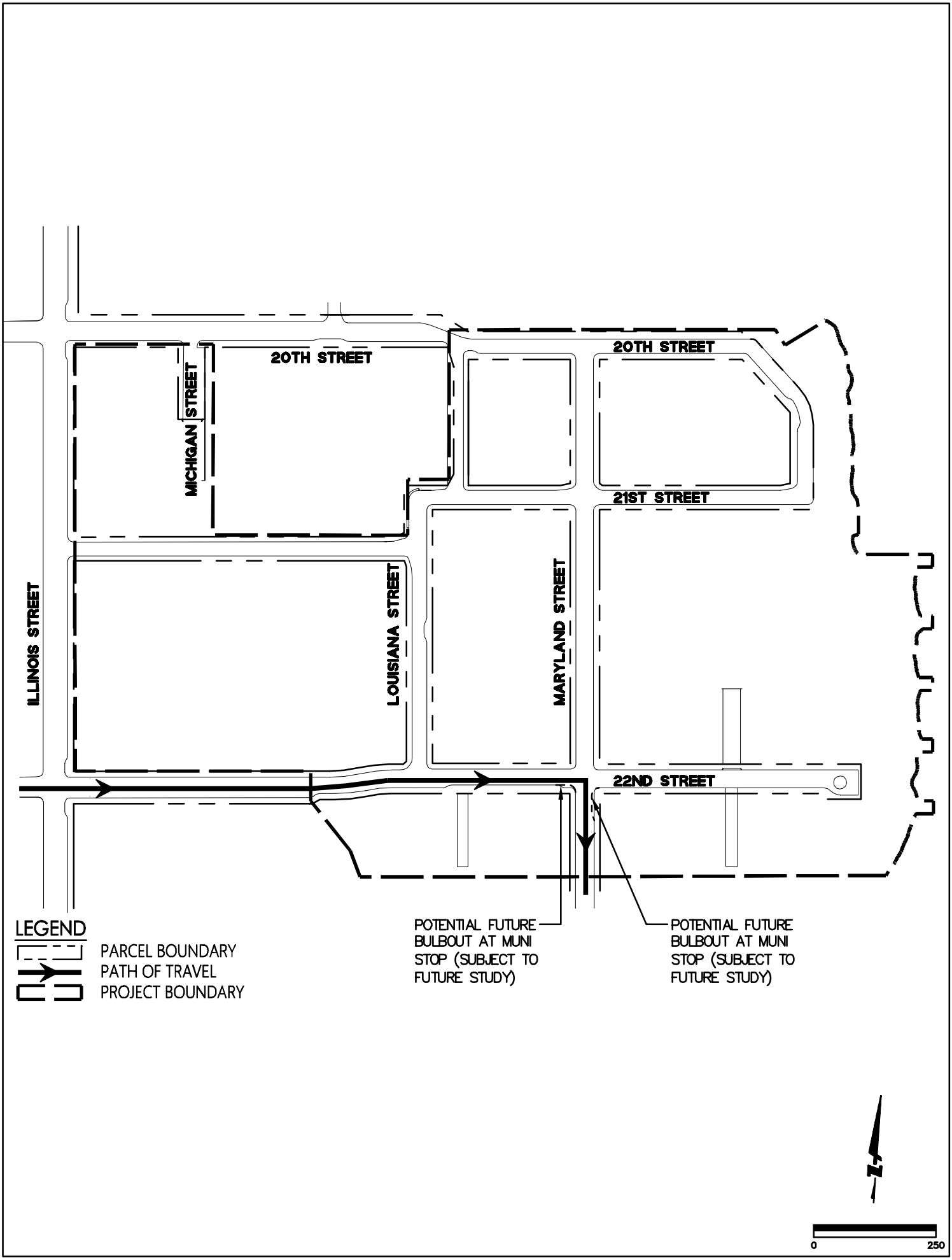
FE–30

	feet
Width	: 9.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.0

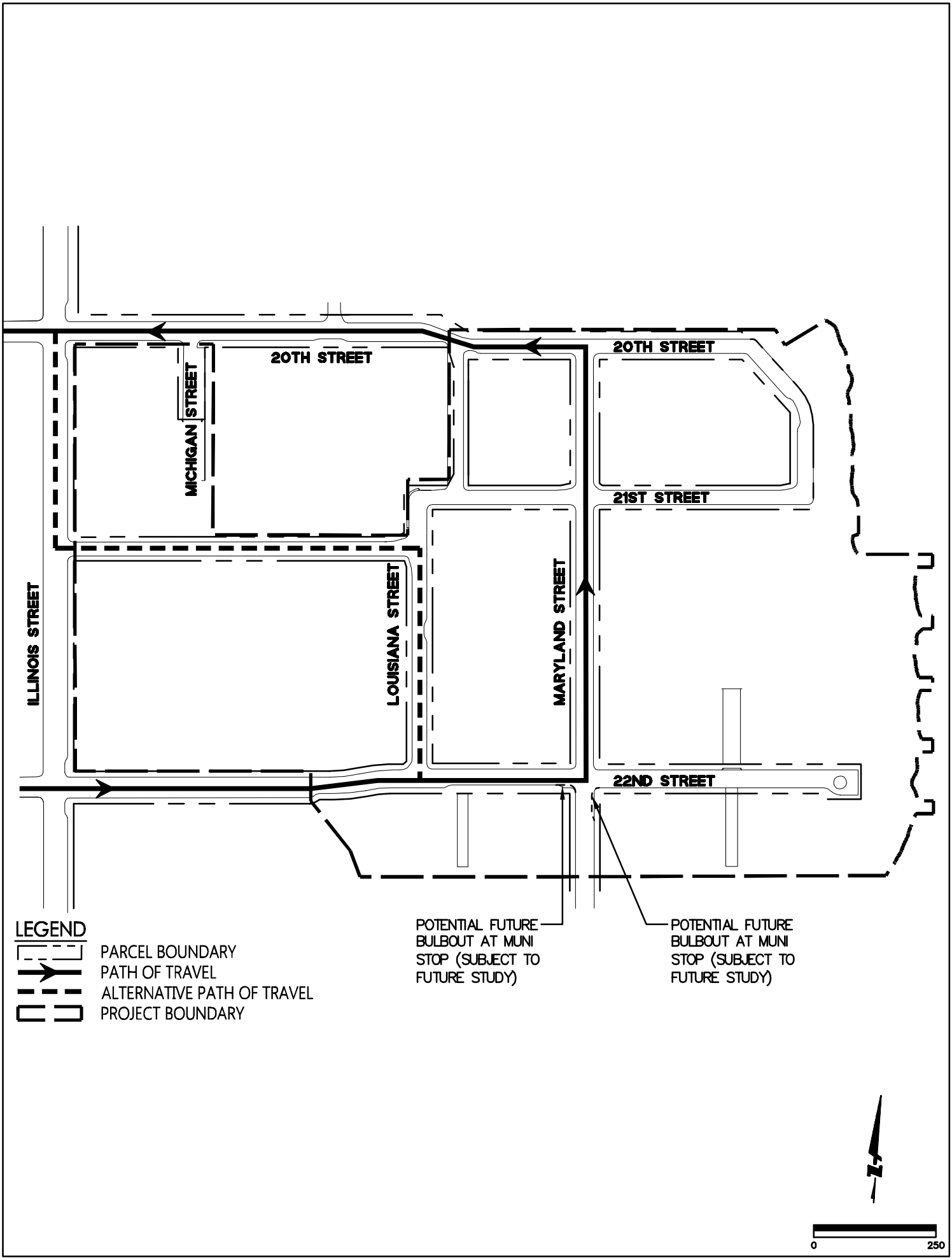


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



DRAWING NAME: \\Bkf-rc\data\Eng13\130162\Exhibits\Truck Turning\Figures\Figure 3-Bus Route.dwg
PLOT DATE: 10-01-18 PLOTTED BY: sade



DRAWING NAME: \\Bkf-rc\data\Eng13\130162\Exhibits\Truck Turning\Figures\Figure 4-TMA ShuttleRoute.dwg
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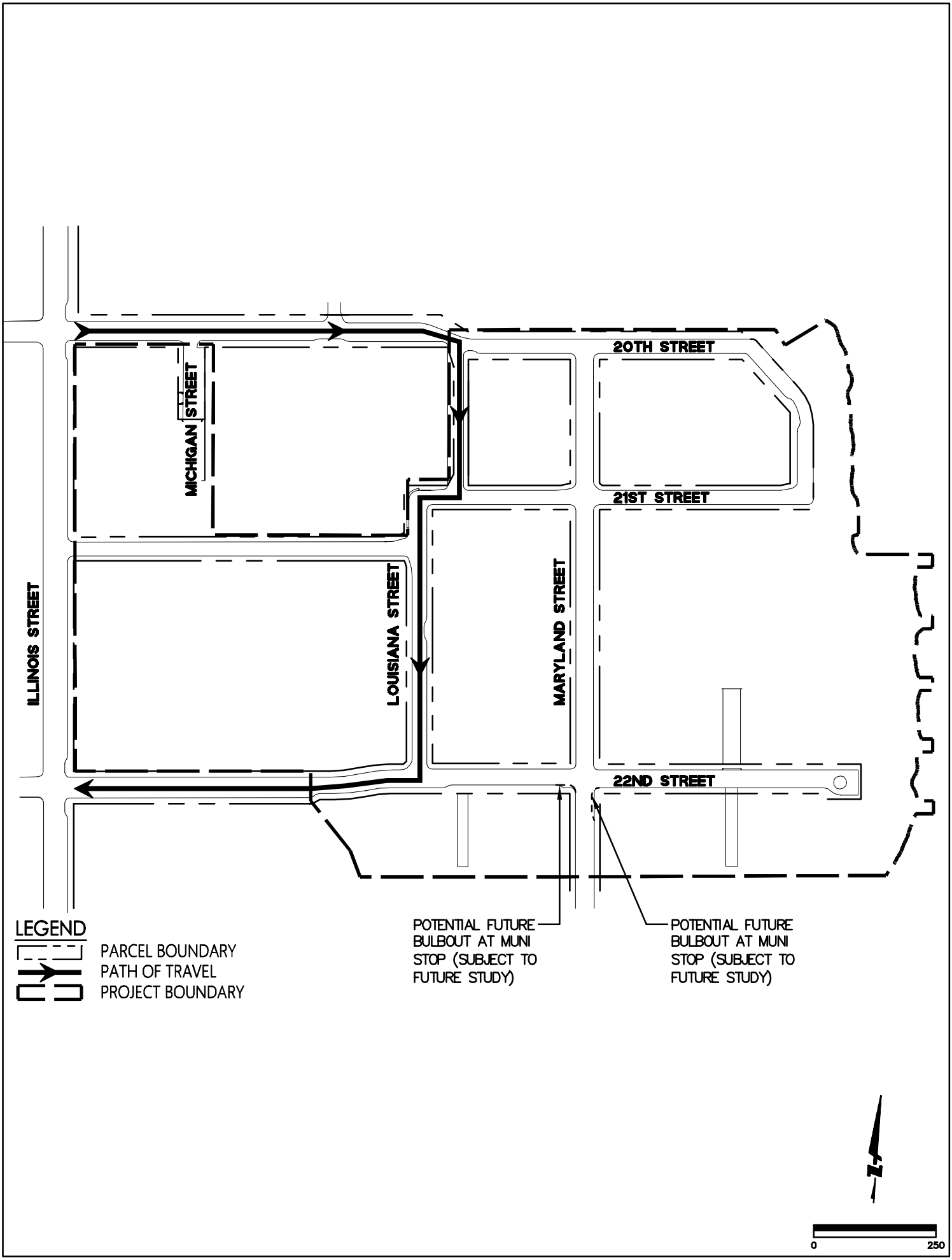


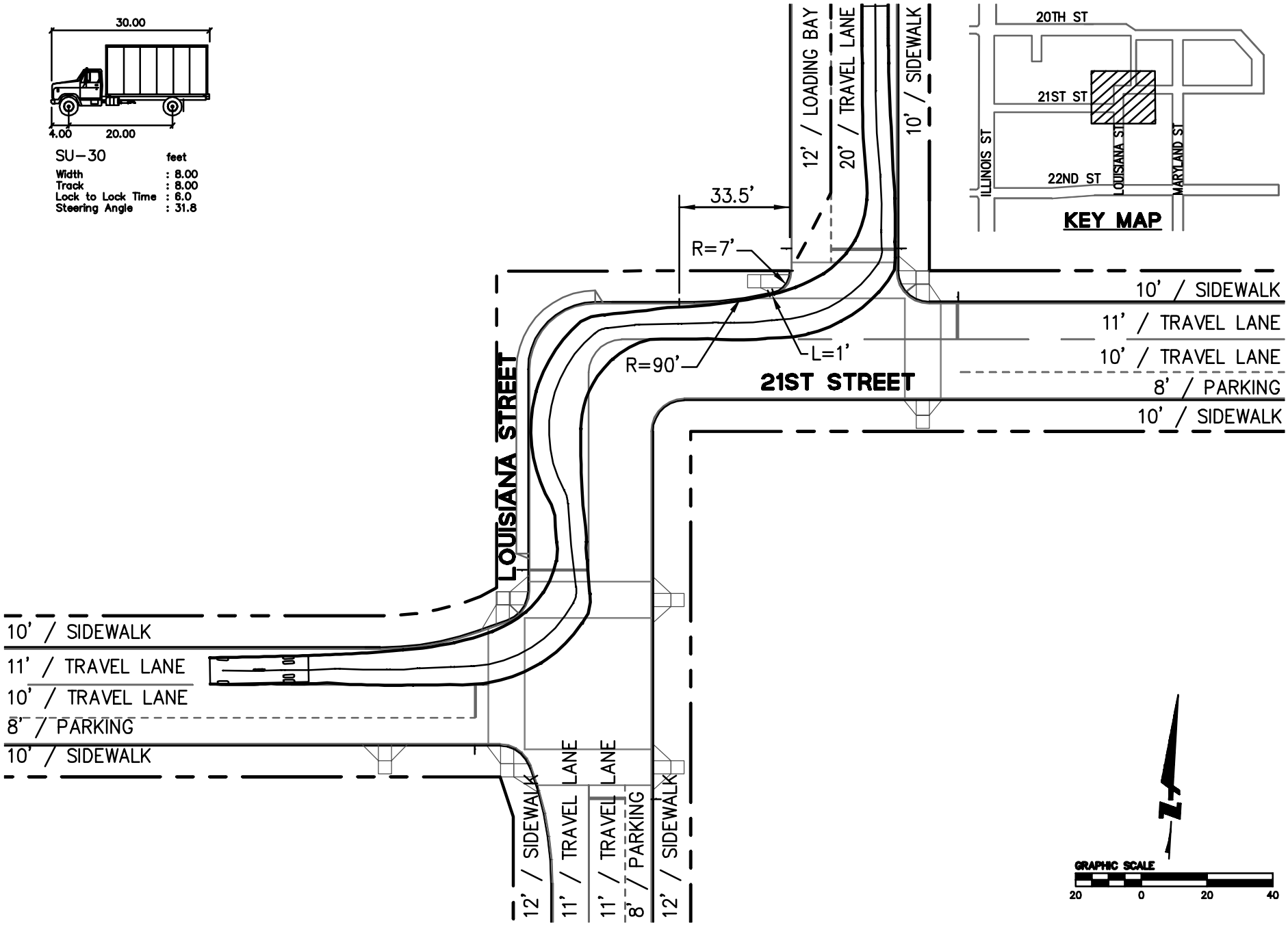
DRAWING NAME: \\Bkf-rc\data\Eng13\130162\Exhibits\Truck Turning\Figures\Figure 5-WB50 Route.dwg
PLOT DATE: 10-01-18 PLOTTED BY: sade

ATTACHMENT A

SU-30 Turning Compound Radii Corner Studies

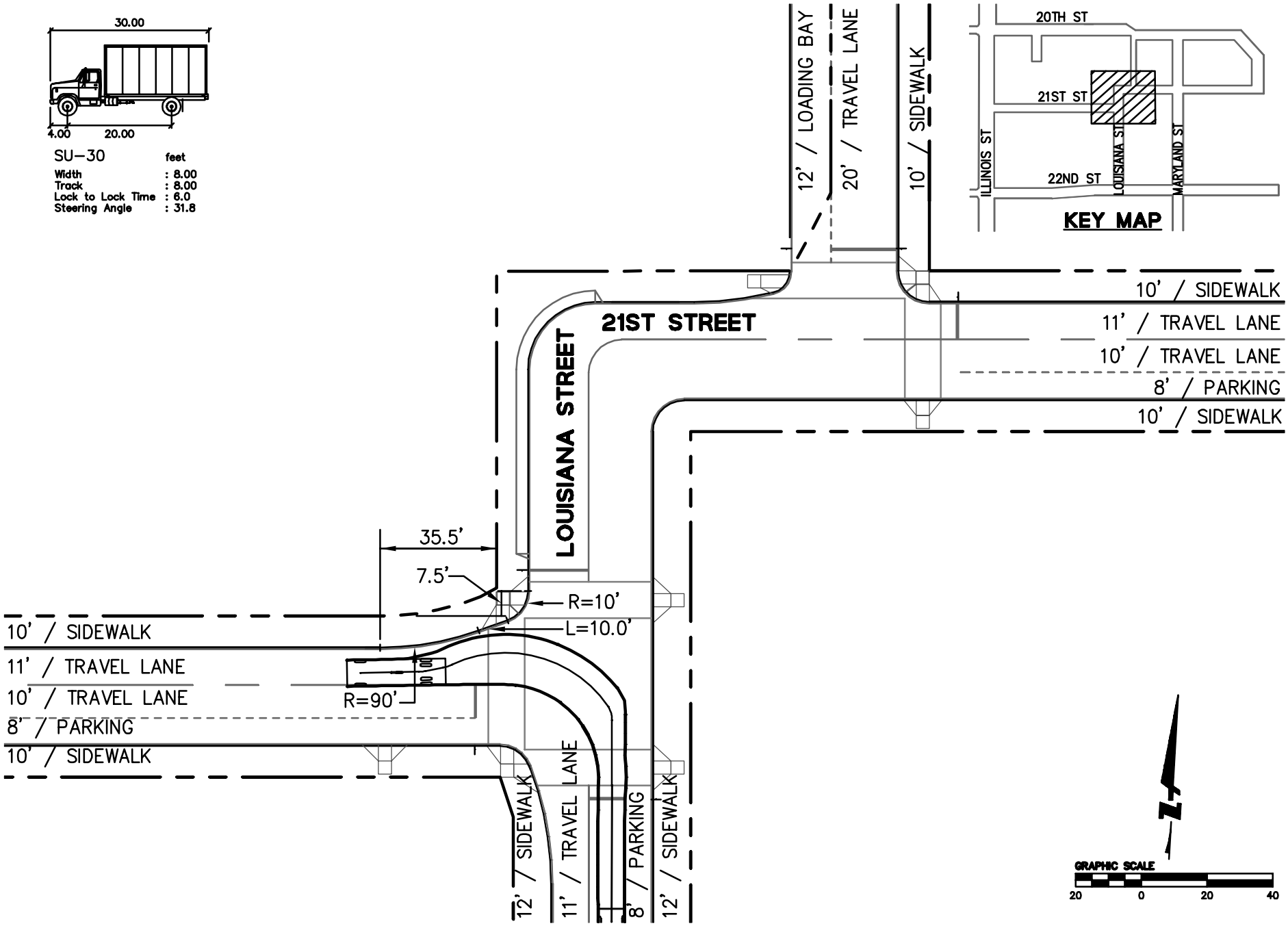
SU–30 feet

Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



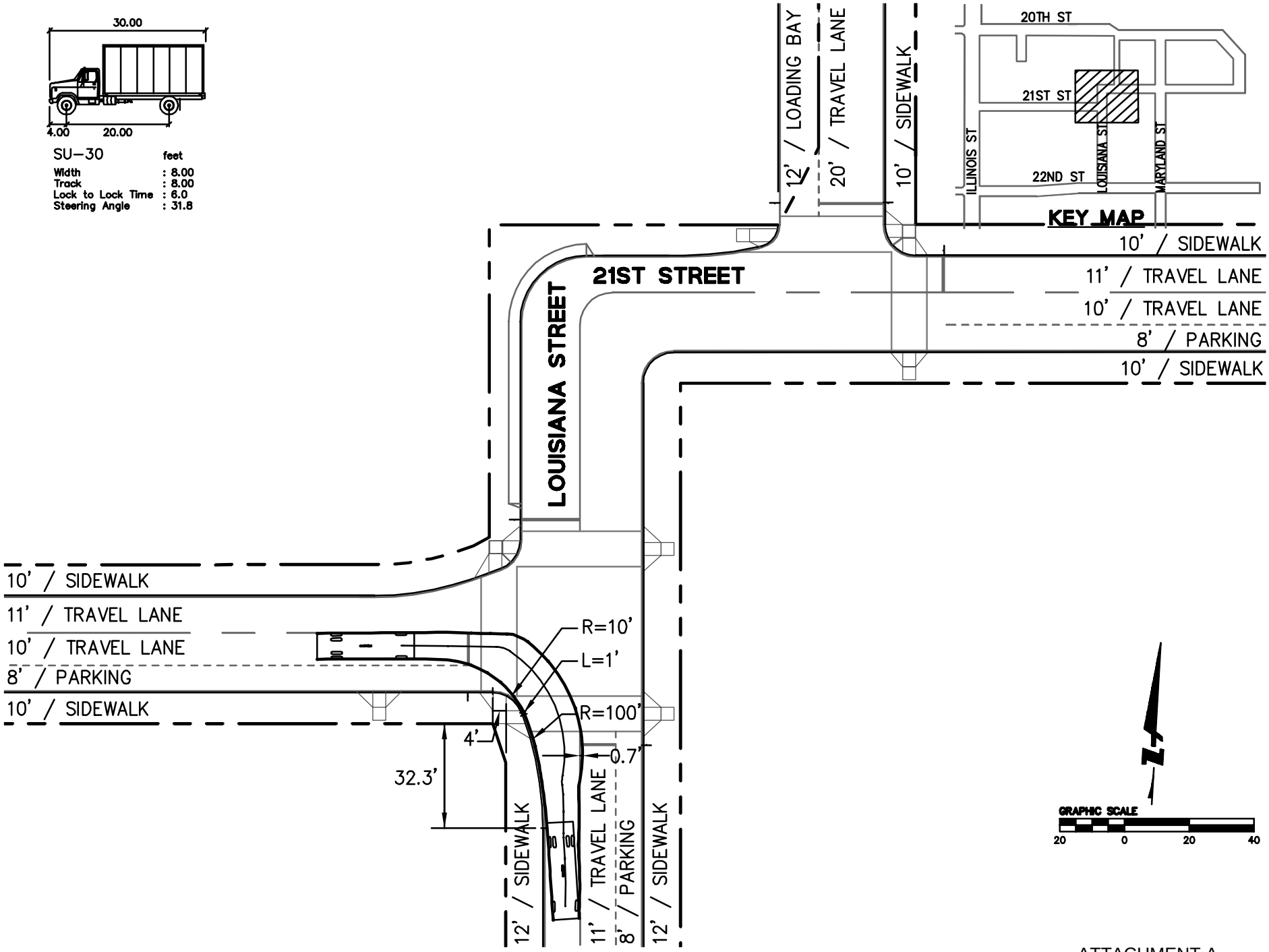
SU–30 feet

Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



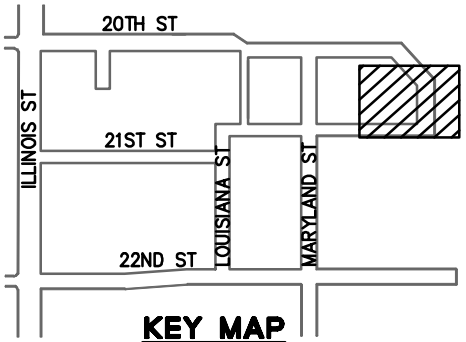
SU–30 feet

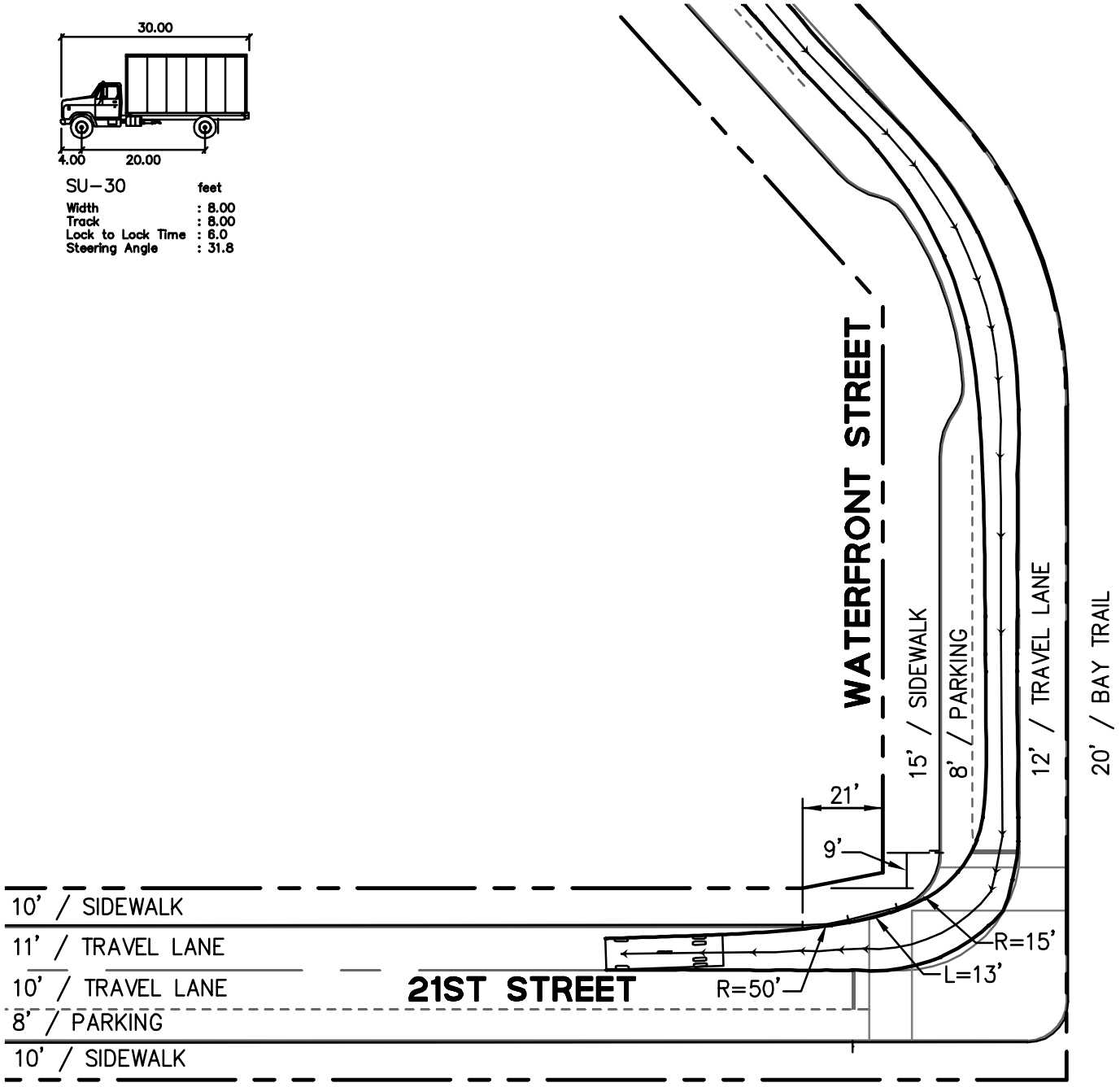
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

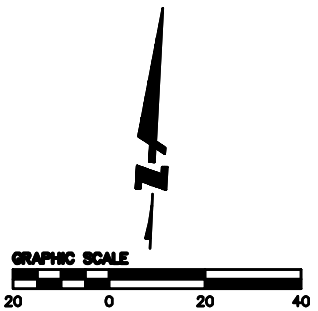


SU–30 feet

Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

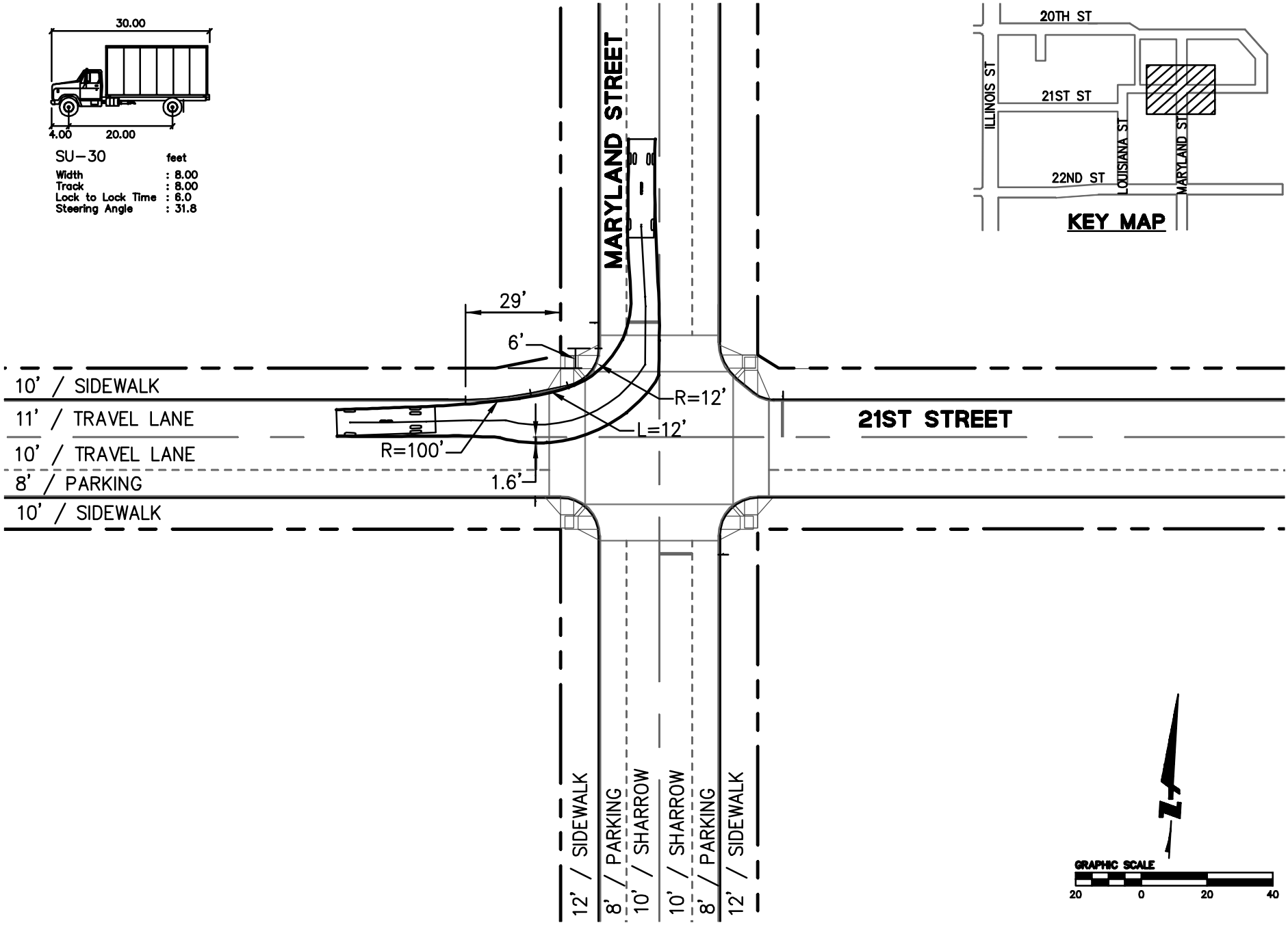






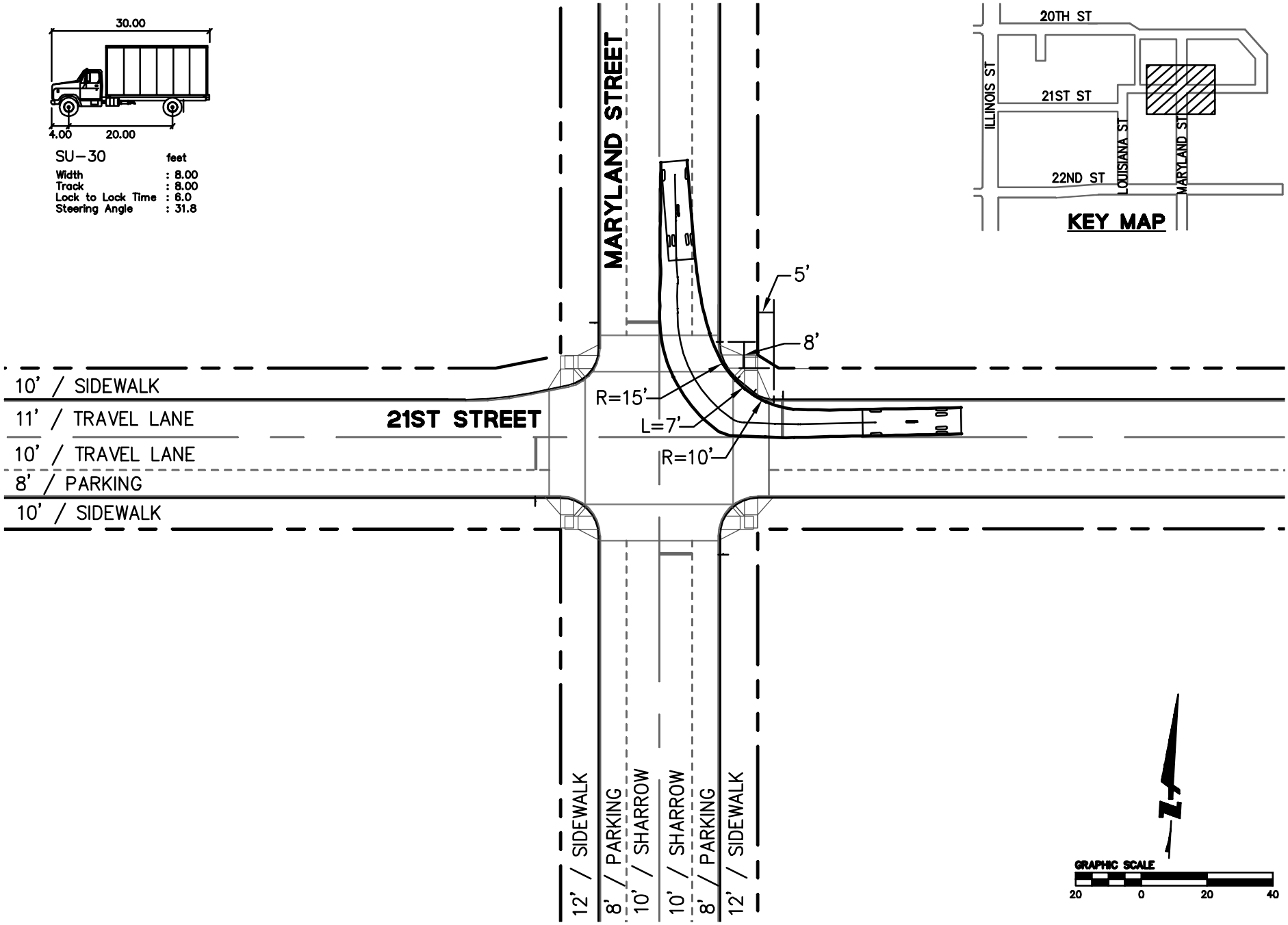
SU–30 feet

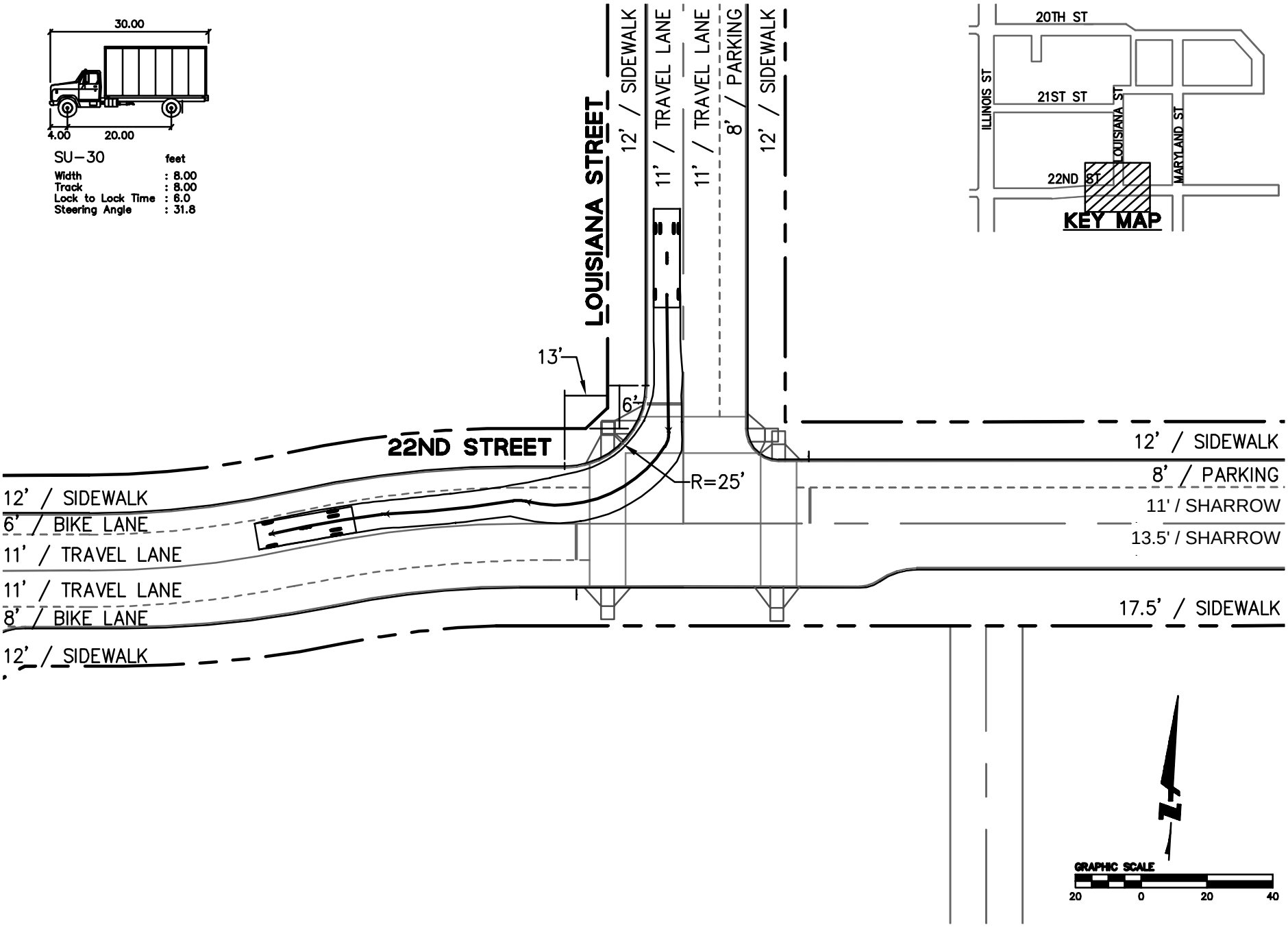
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



SU–30 feet

Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



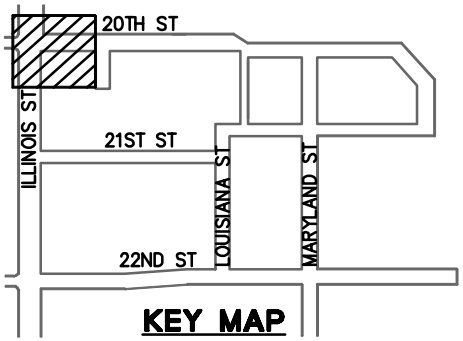

30.00
4.00
20.00
SU–30
feet
Width : 8.00
Track : 8.00
Lock to Lock Time : 6.0
Steering Angle : 31.8
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
LOUISIANA STREET
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
13'
6'
22ND STREET
R=25'
12' / SIDEWALK
6' / BIKE LANE
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / BIKE LANE
12' / SIDEWALK
12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK
GRAPHIC SCALE
20 0 20 40

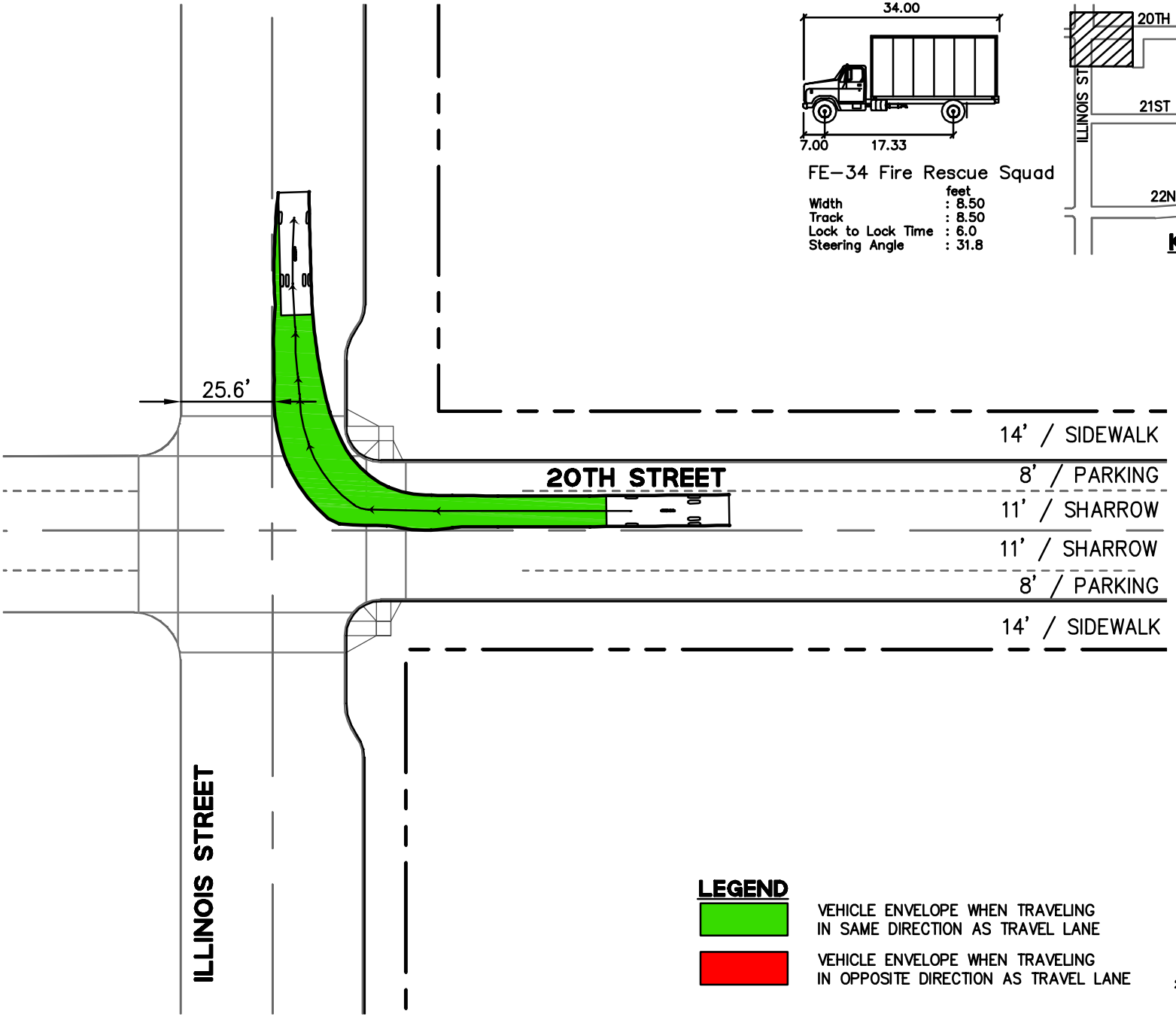
ATTACHMENT B

SFFD FE-34 Turning Studies

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

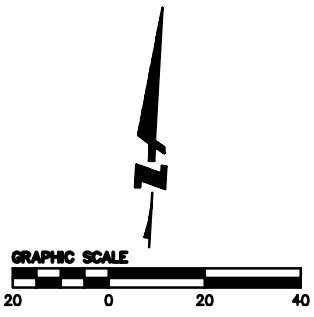




LEGEND

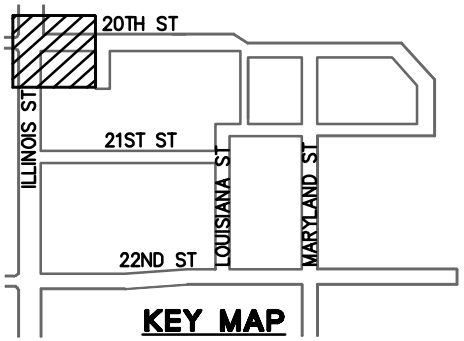
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

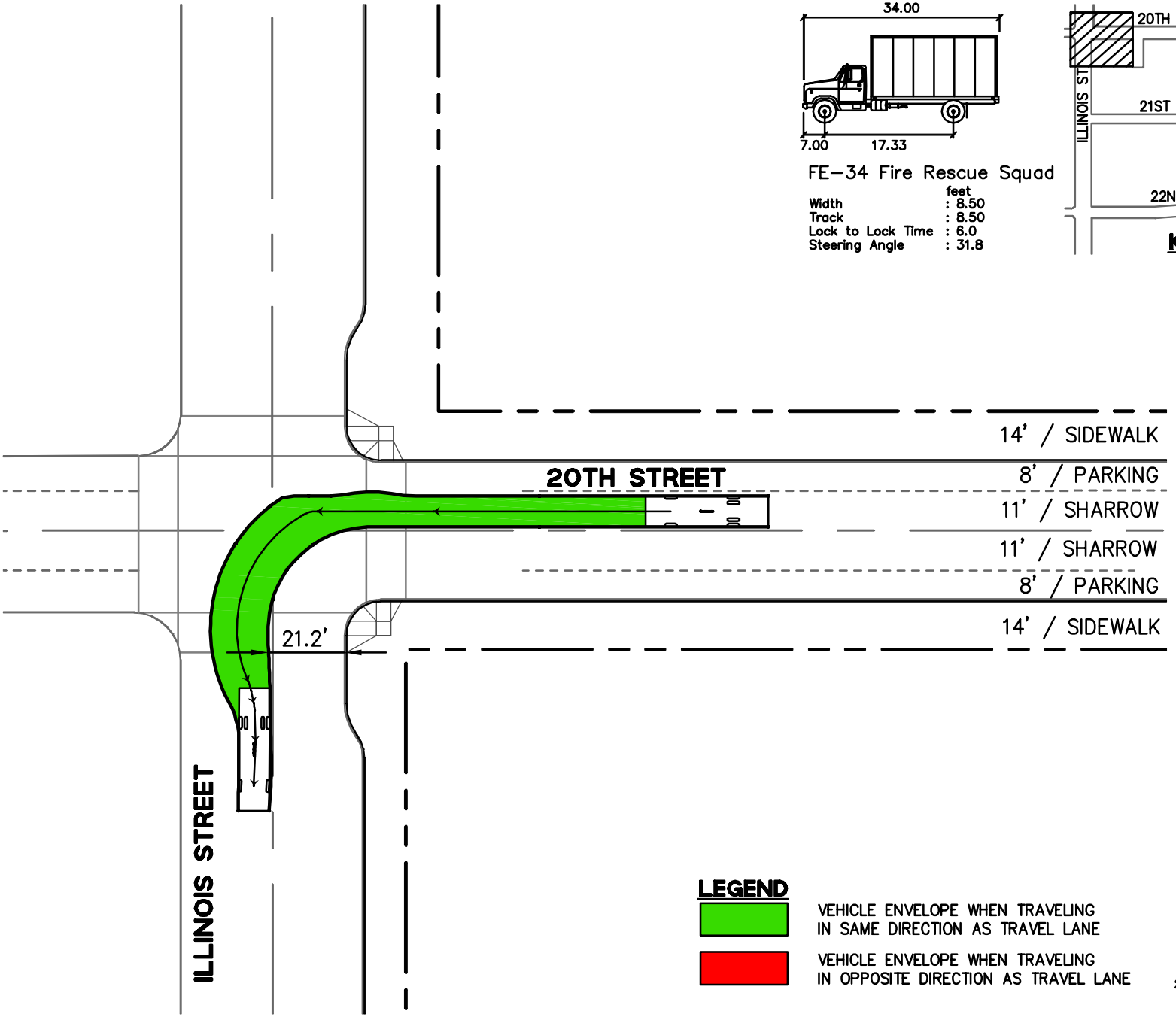
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





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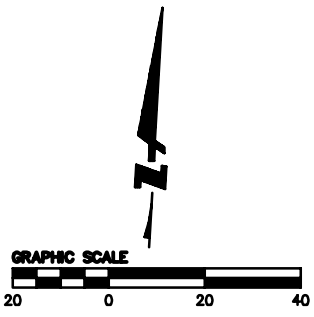
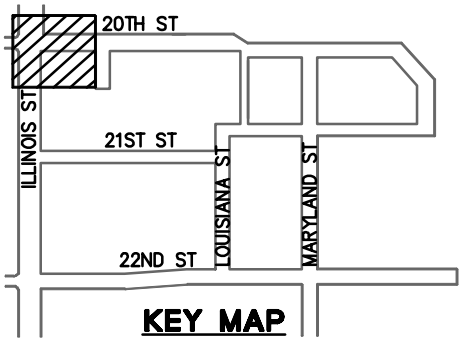
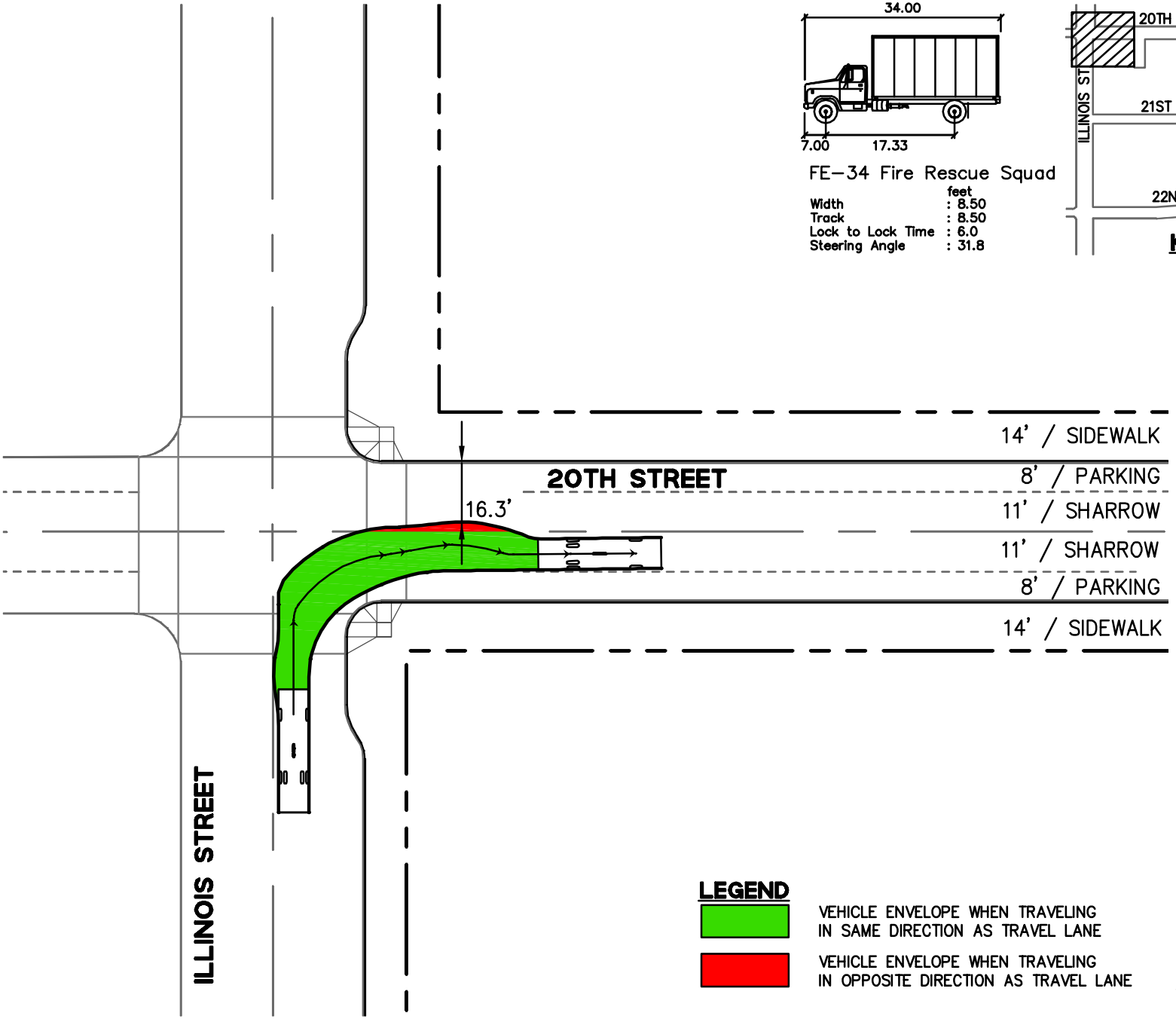


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





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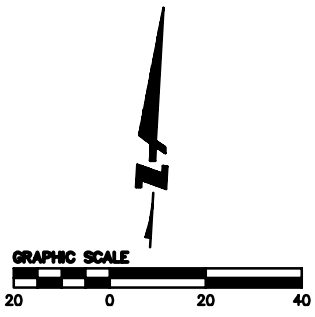
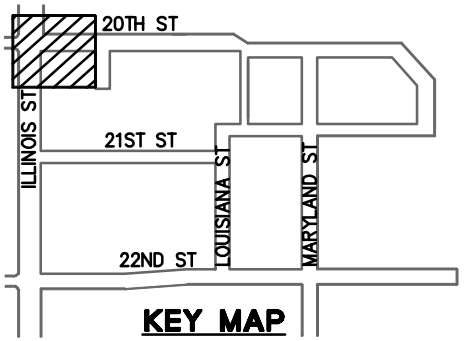
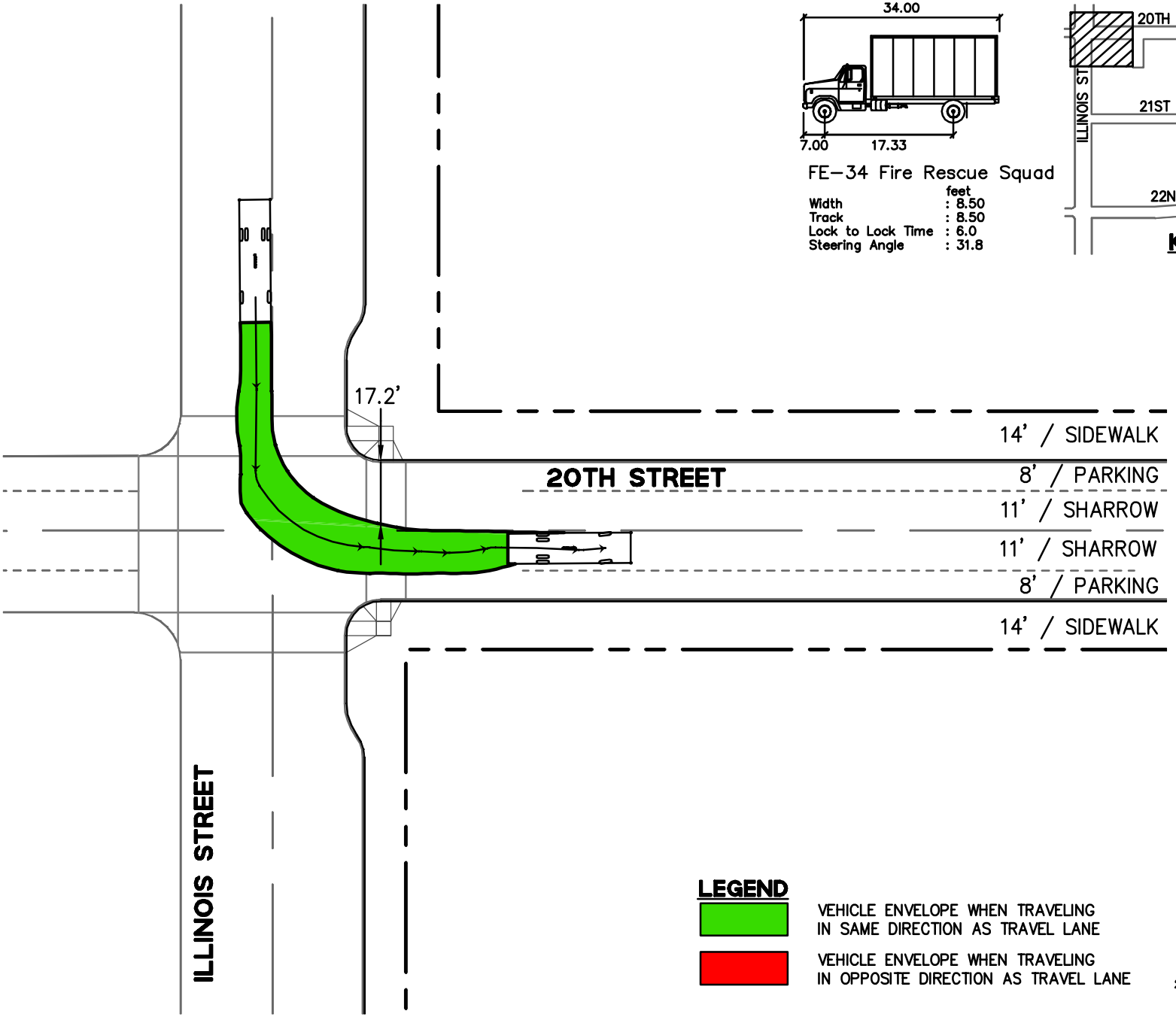


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





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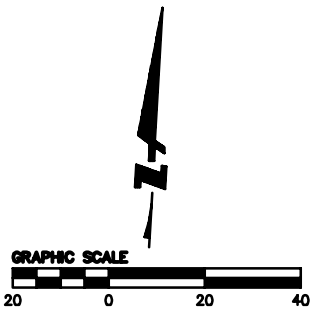
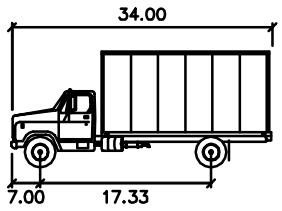
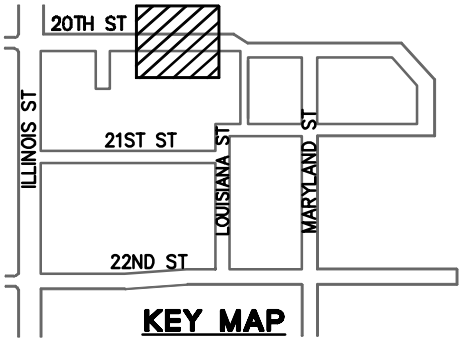
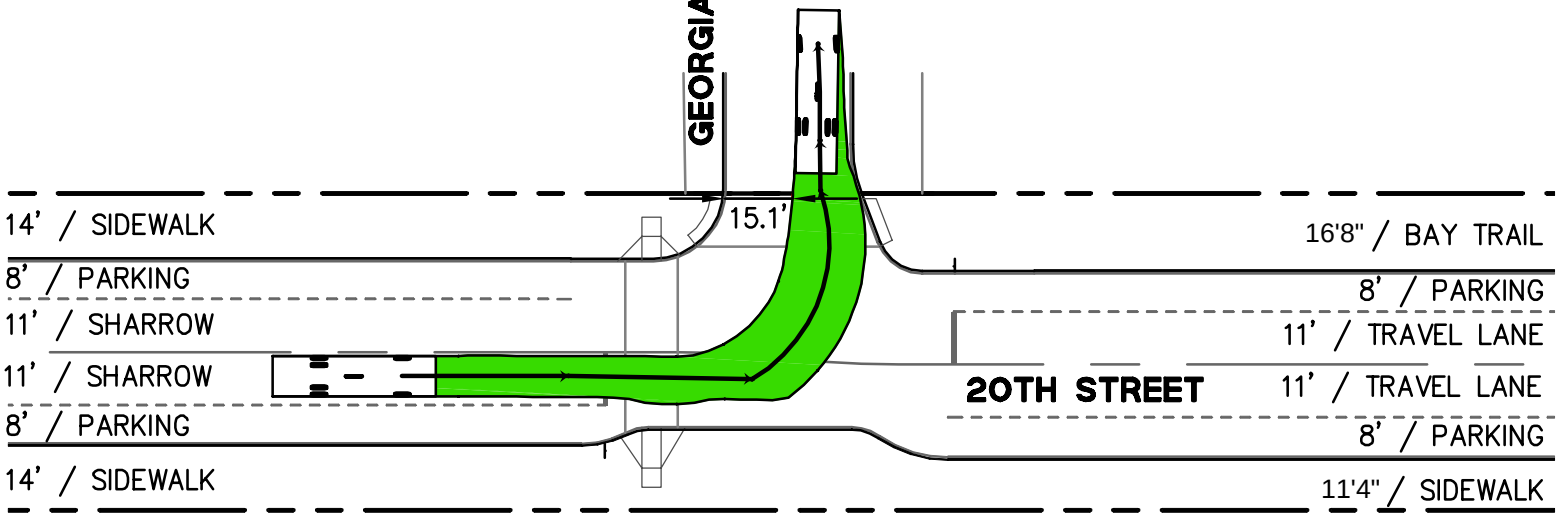




FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





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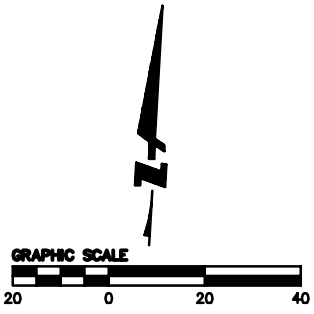
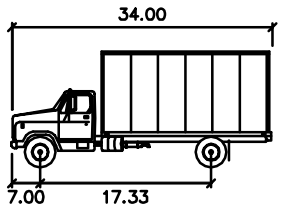
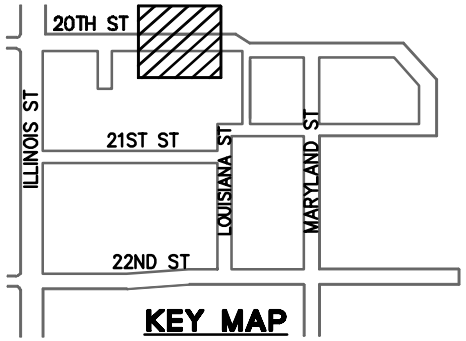
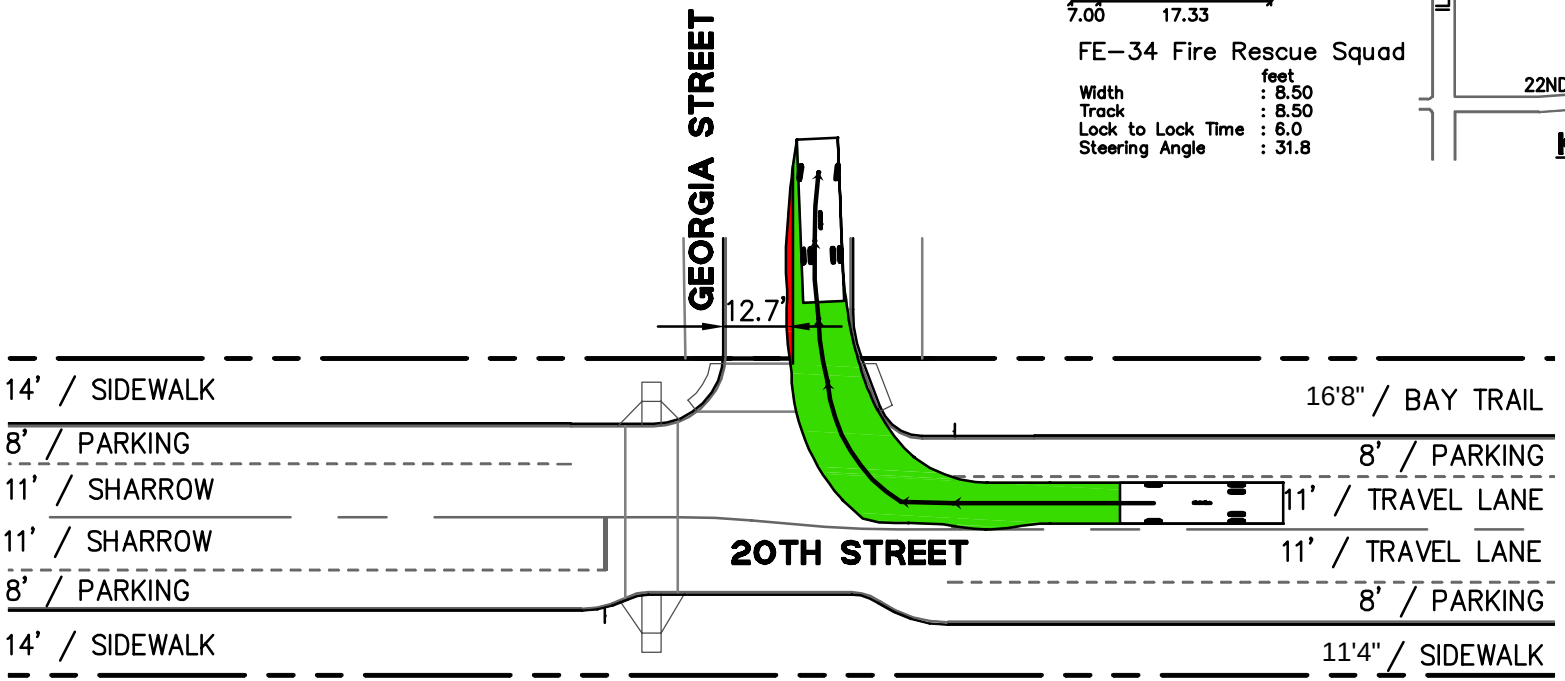




FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





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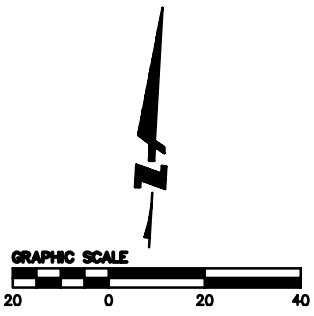
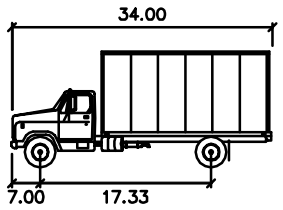
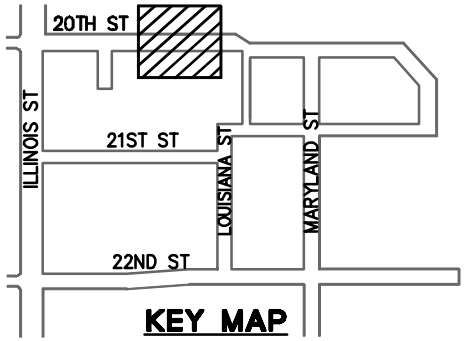
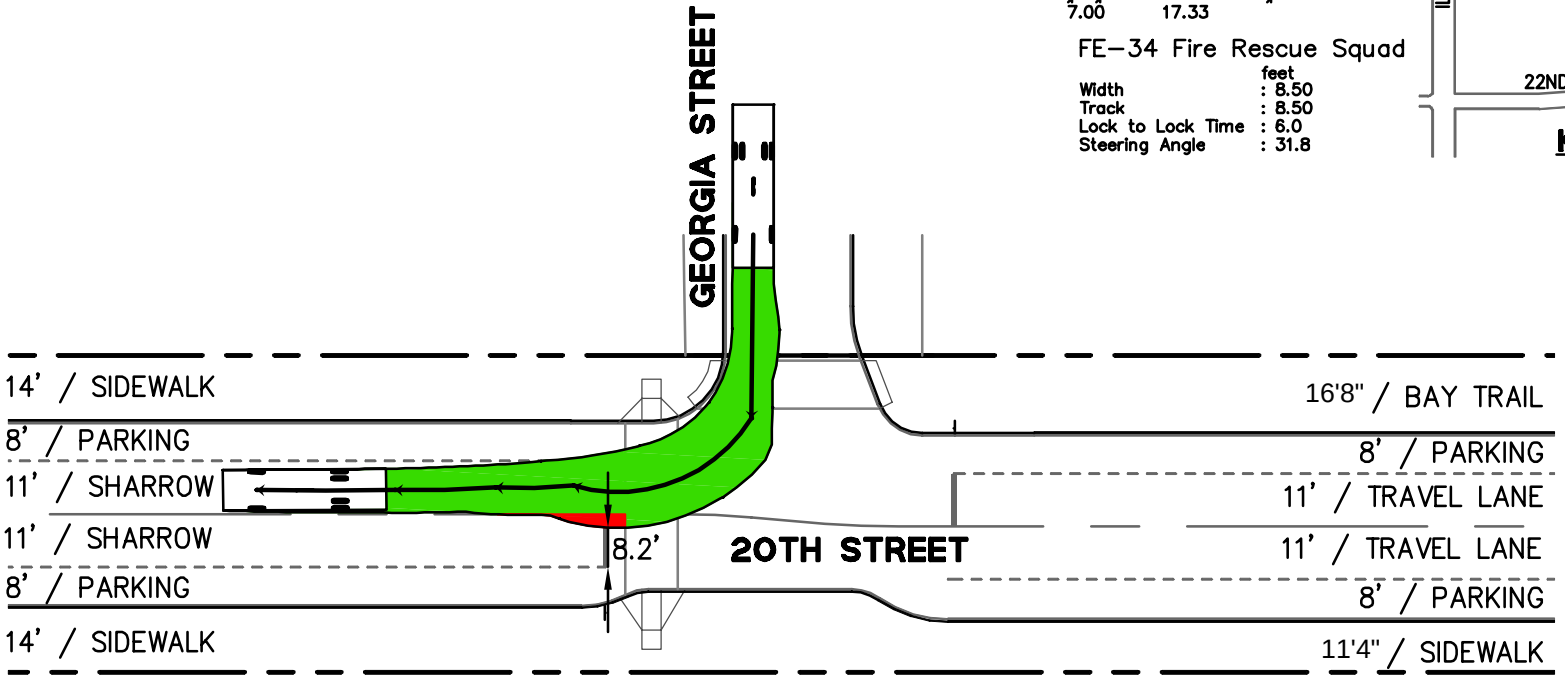




FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

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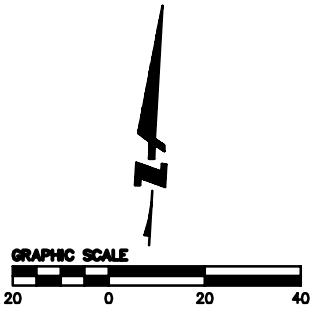
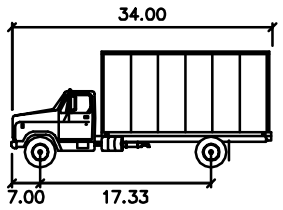
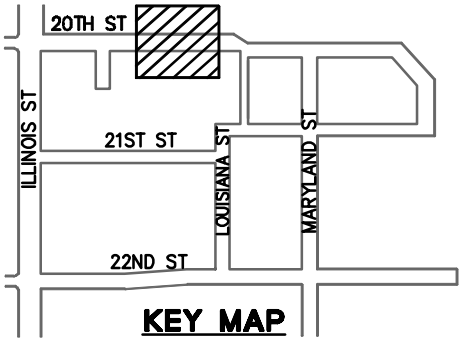
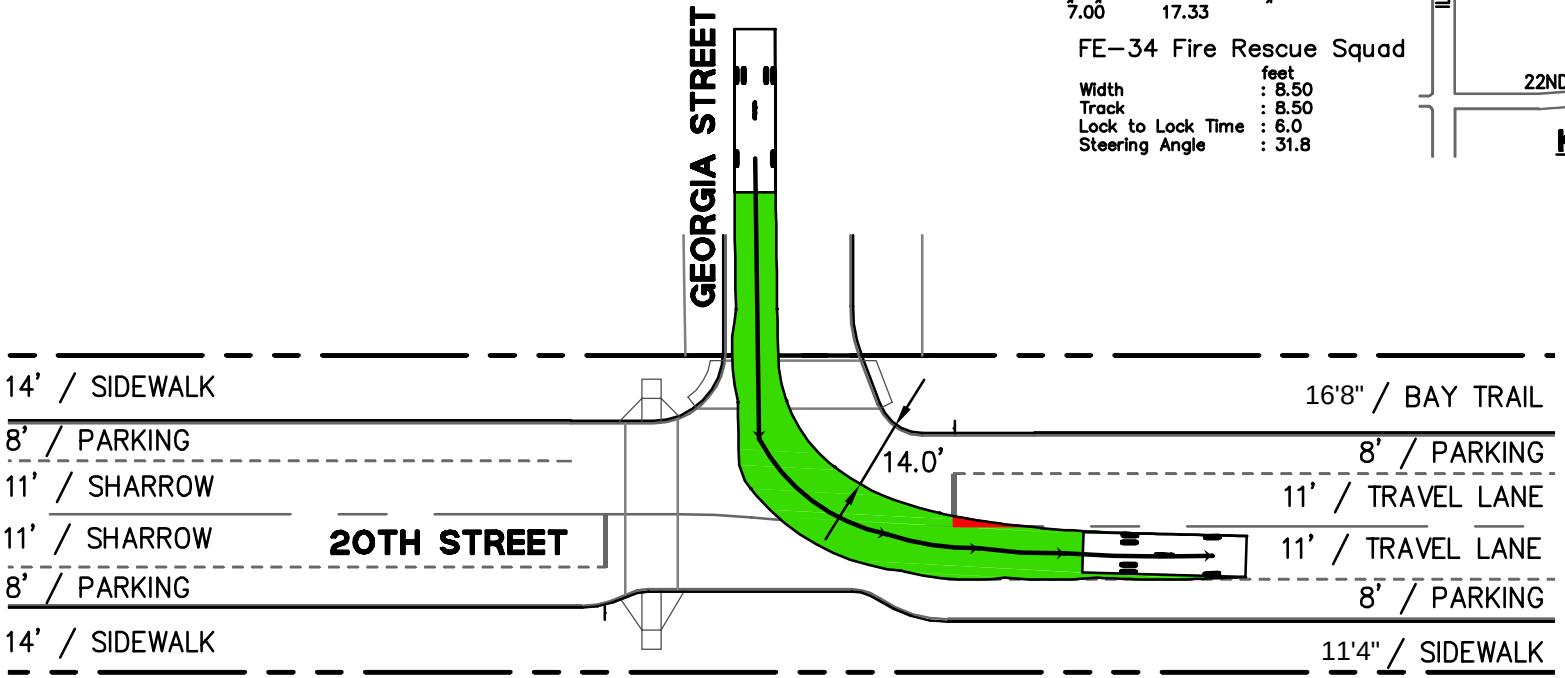




FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

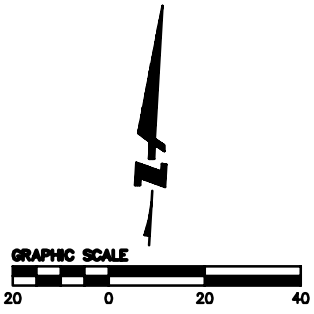


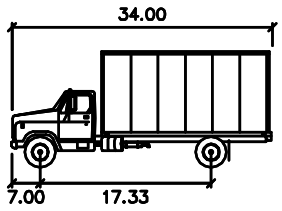


LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

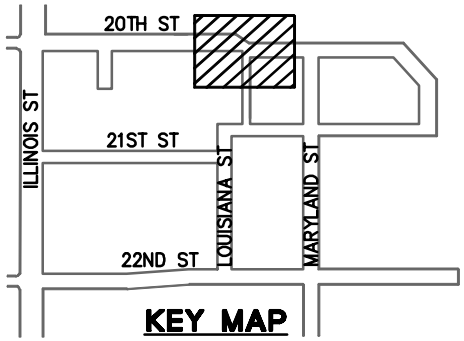
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

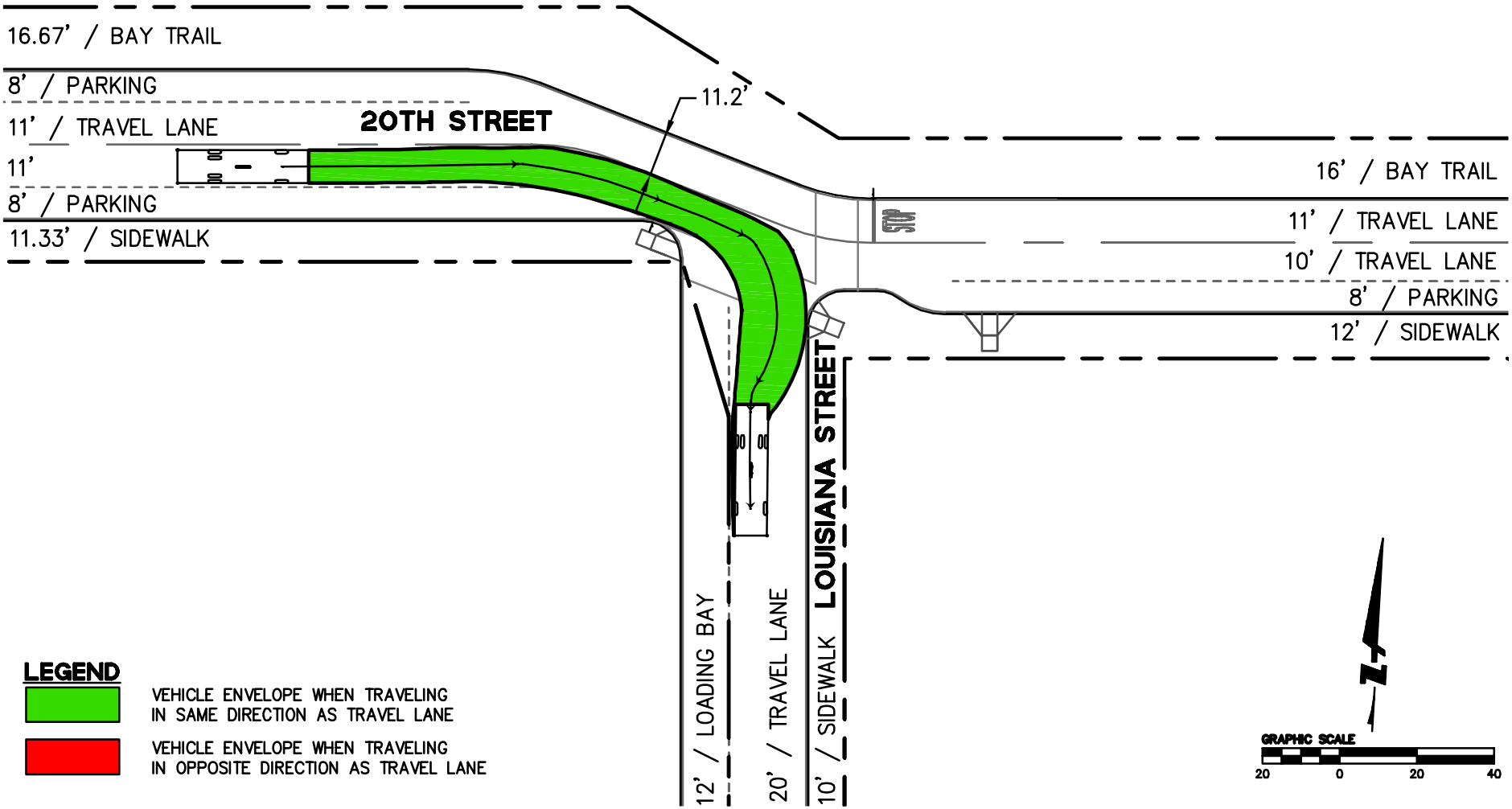


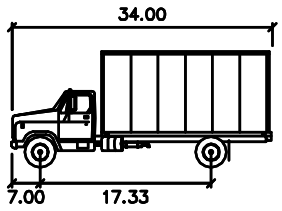


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

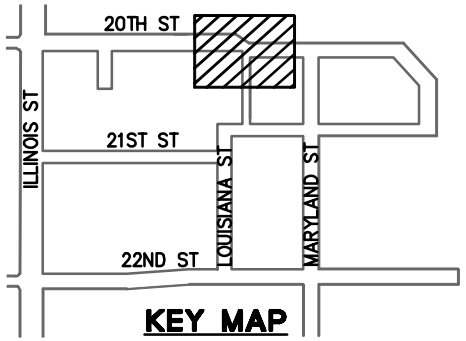


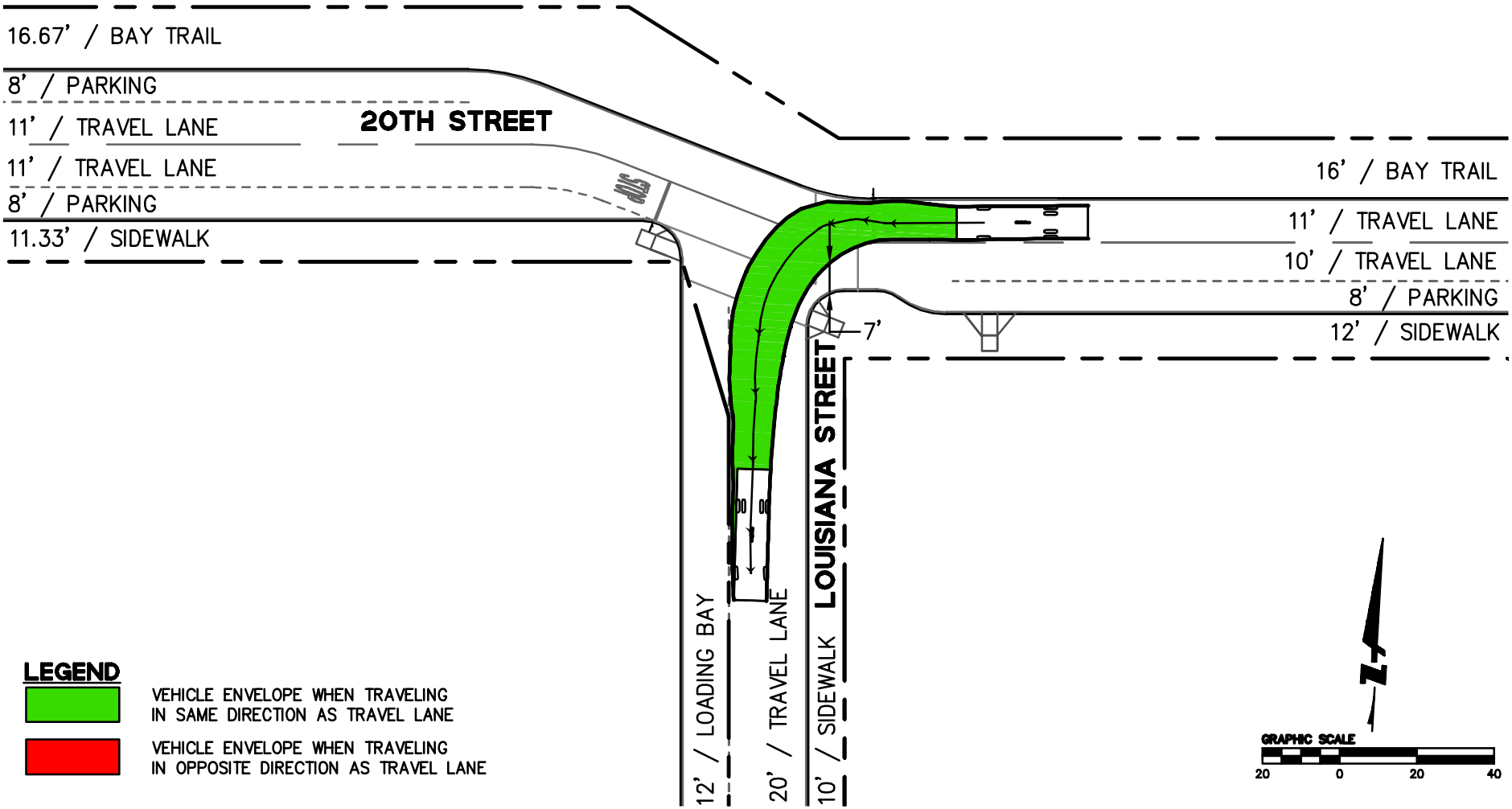


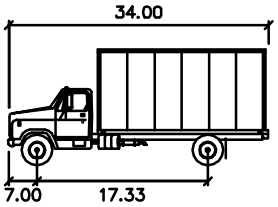


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

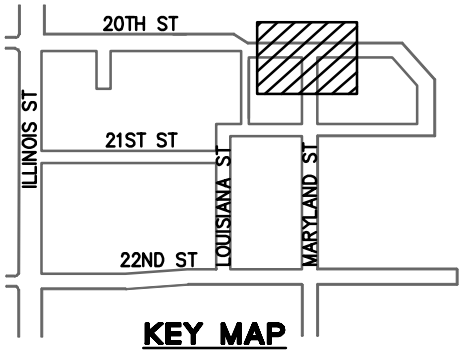


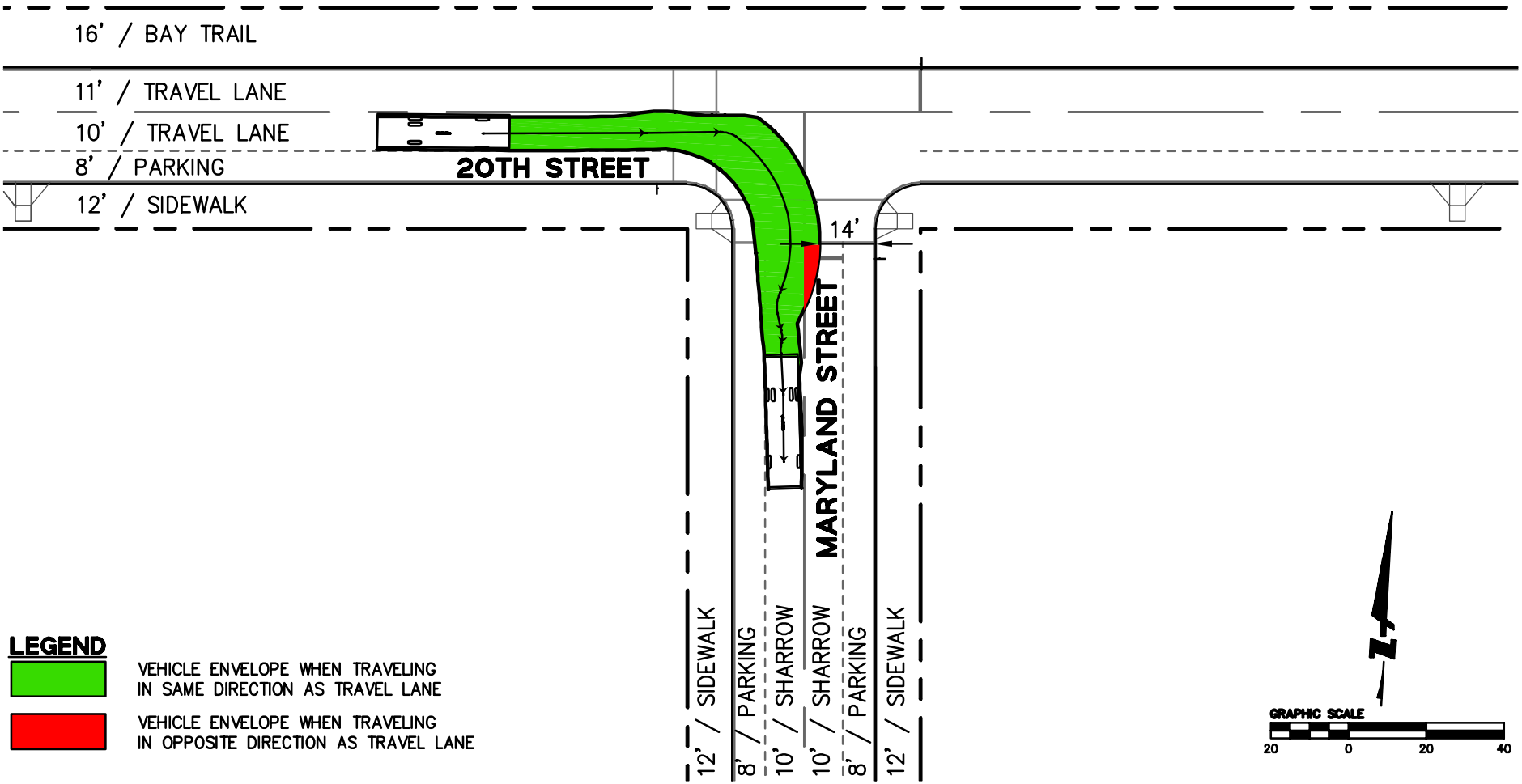


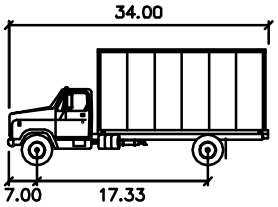


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

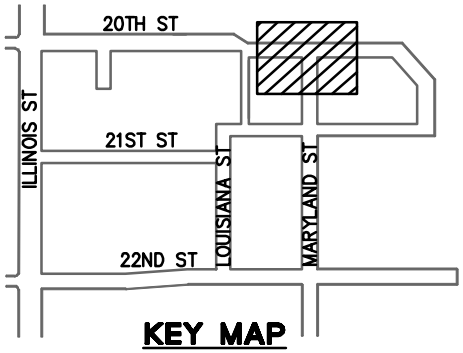


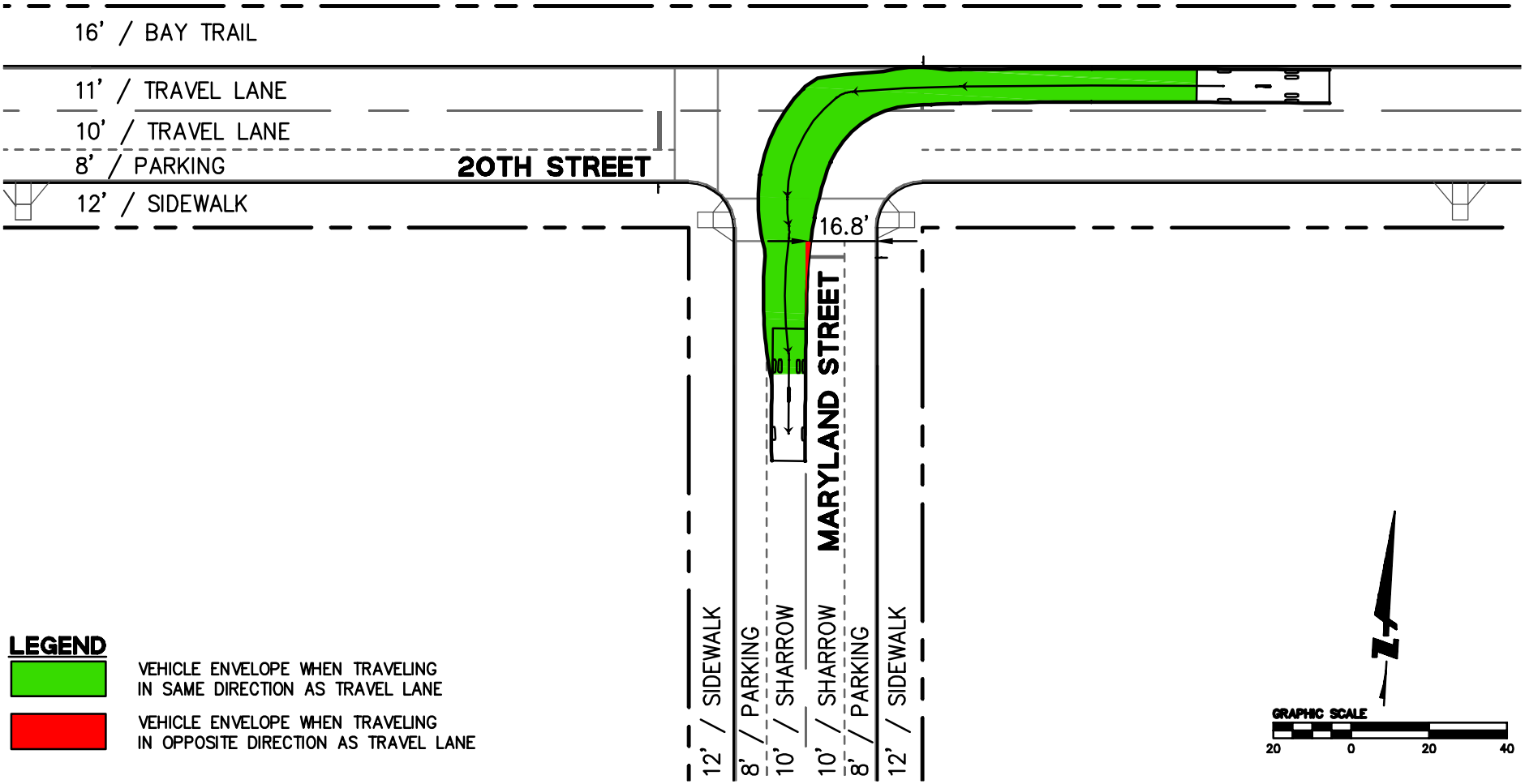


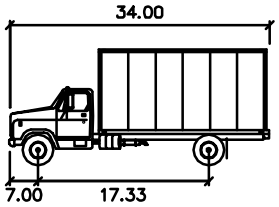


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

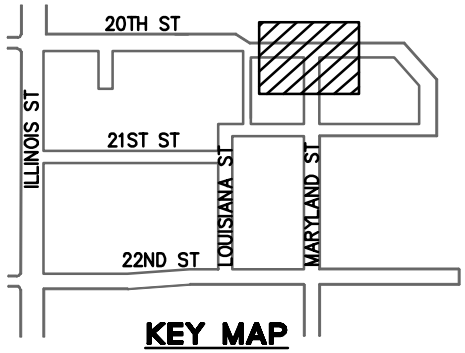




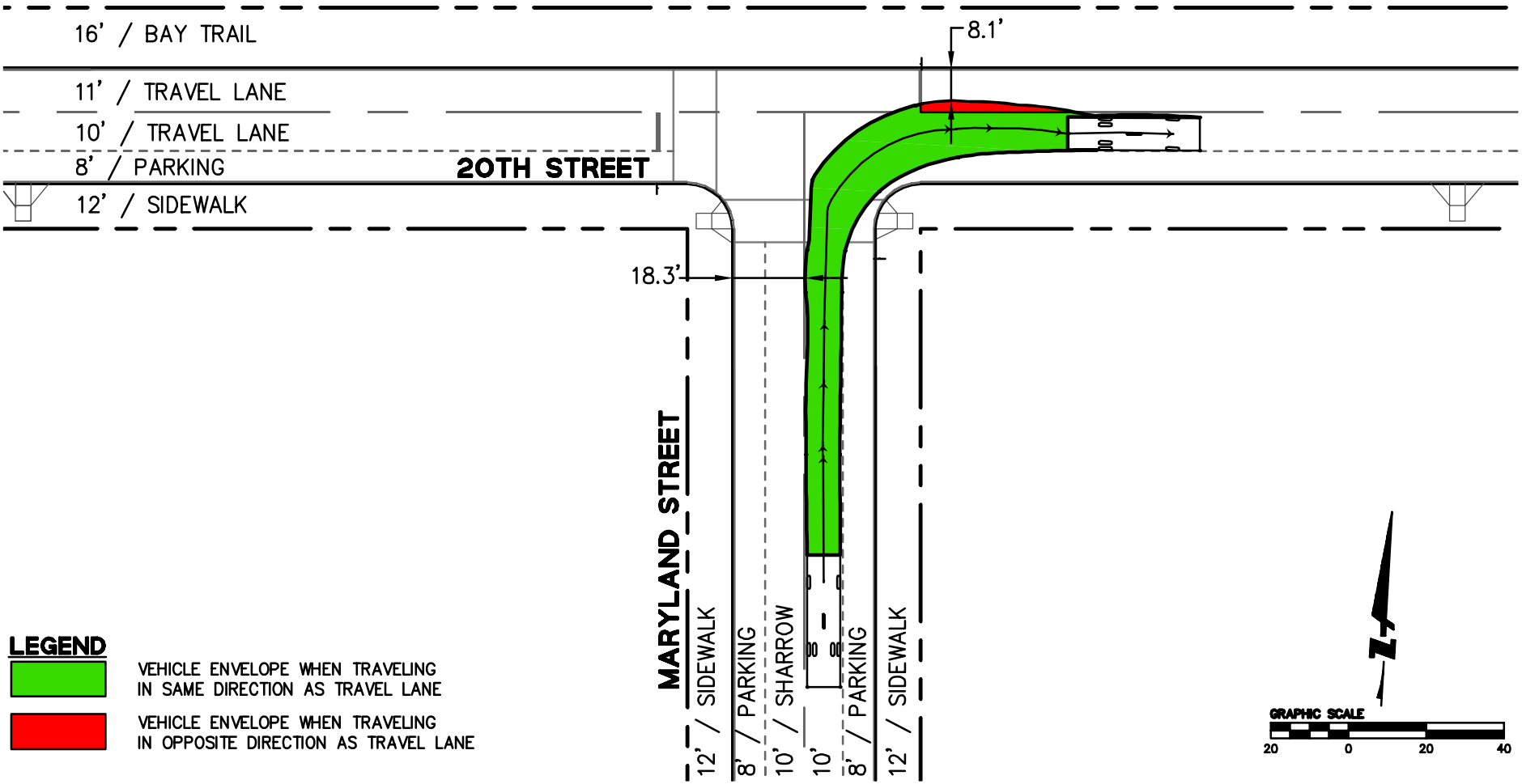


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



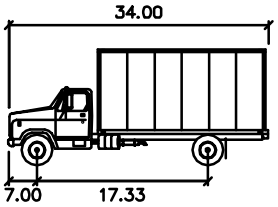
KEY MAP



LEGEND

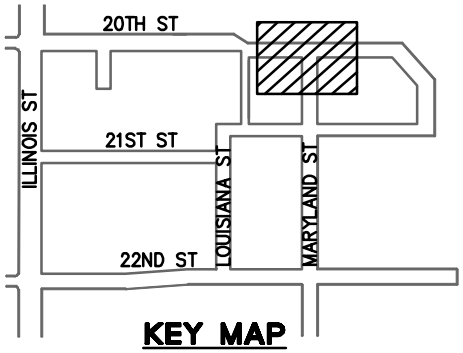
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

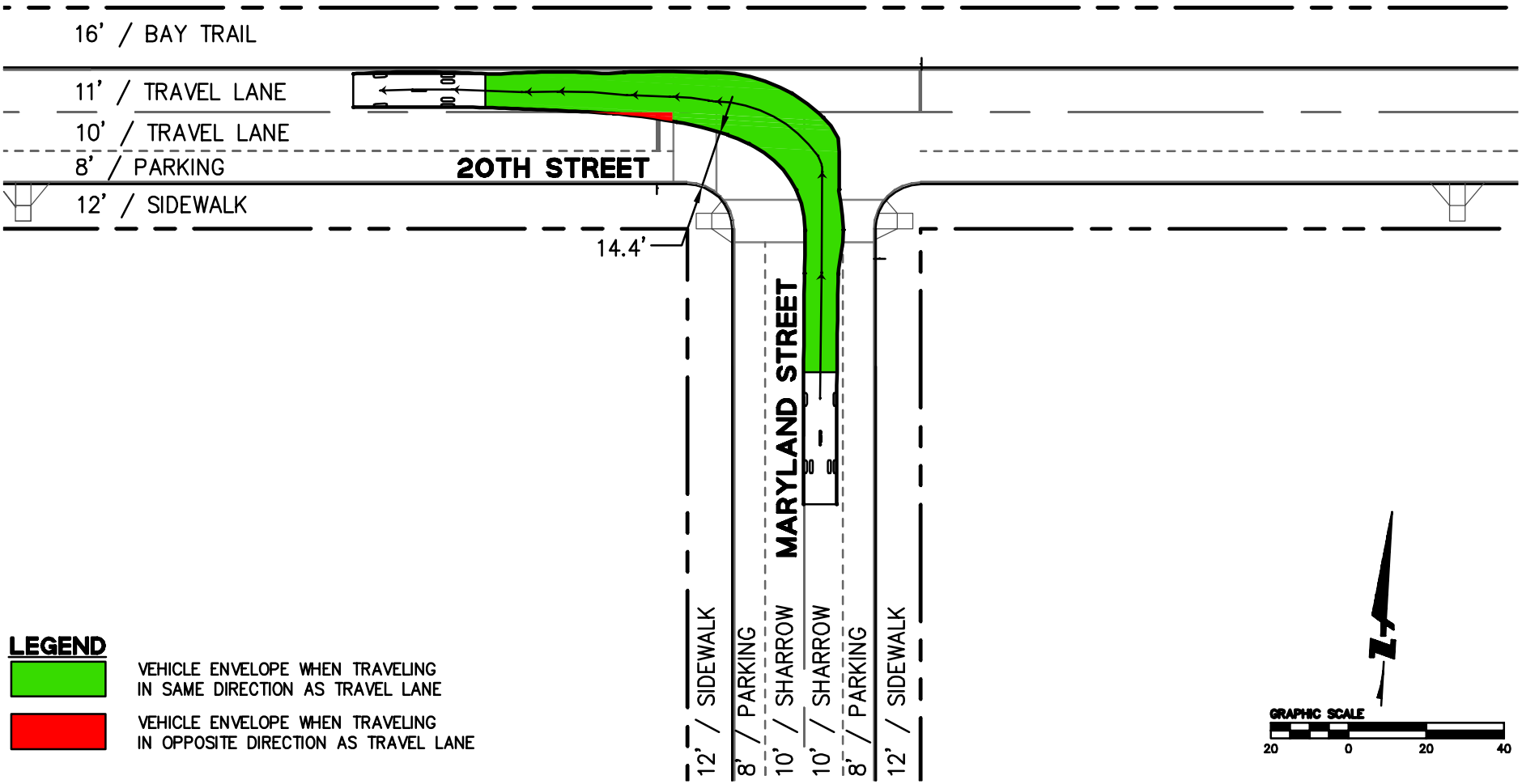
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

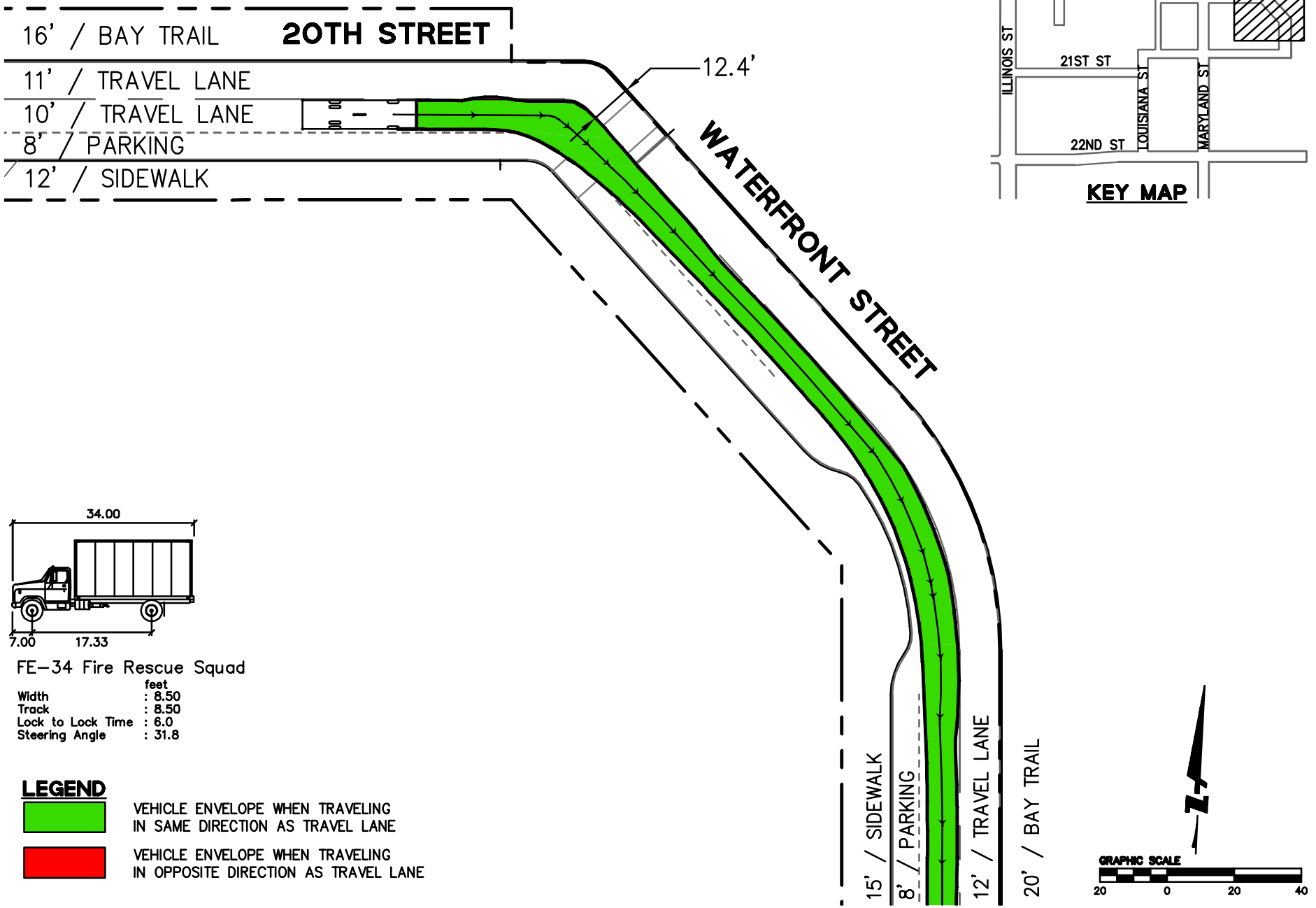


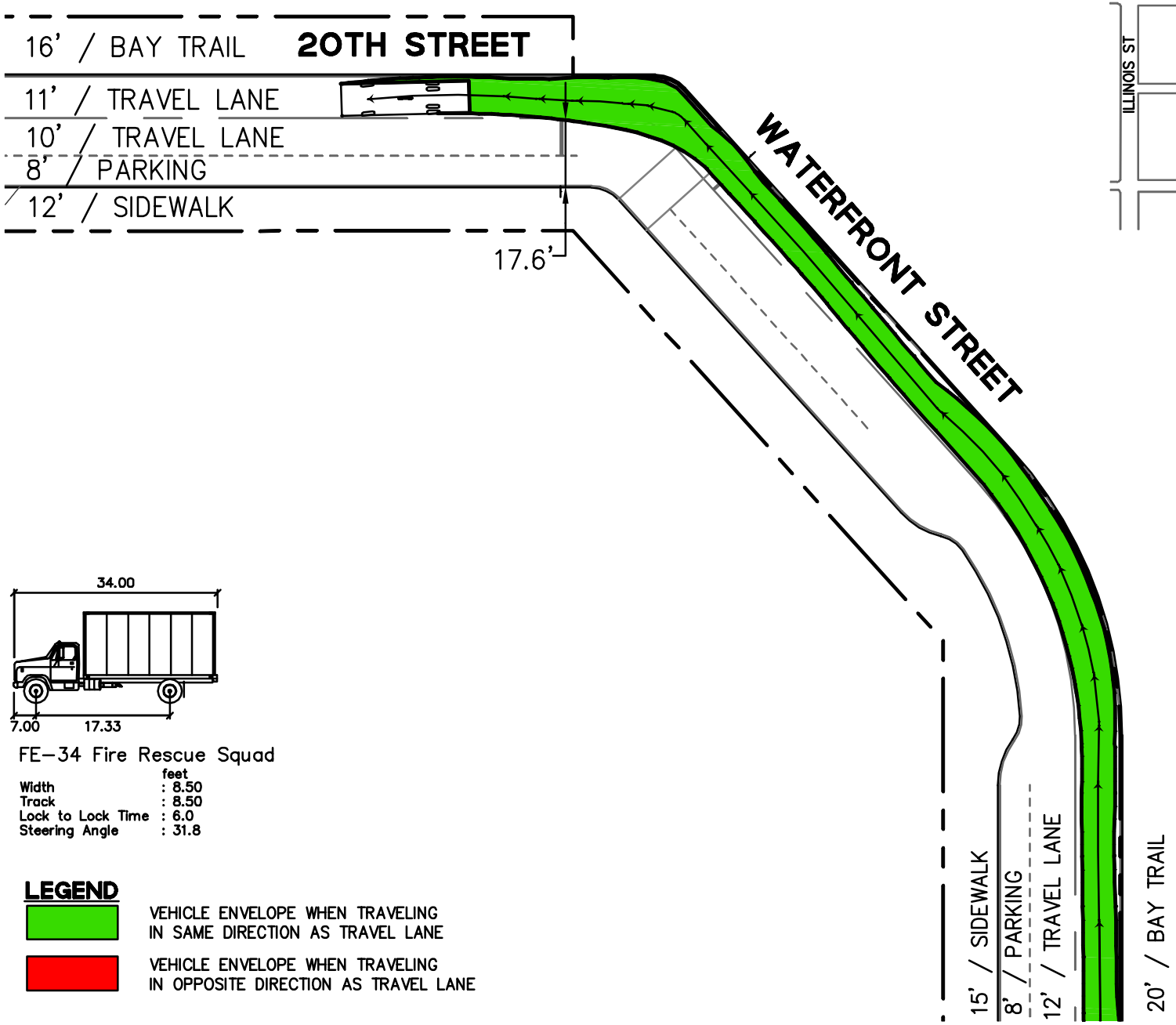
FE–34 Fire Rescue Squad

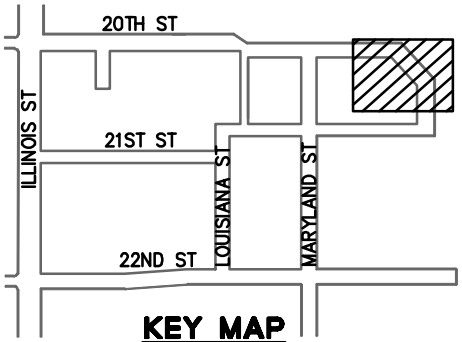
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8






16' / BAY TRAIL
20TH STREET
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
12.4'
WATERFRONT STREET
15' / SIDEWALK
8' / PARKING
12' / TRAVEL LANE
20' / BAY TRAIL
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
34.00
7.00
17.33
FE-34 Fire Rescue Squad
feet
Width : 8.50
Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 31.8
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
GRAPHIC SCALE
20 0 20 40





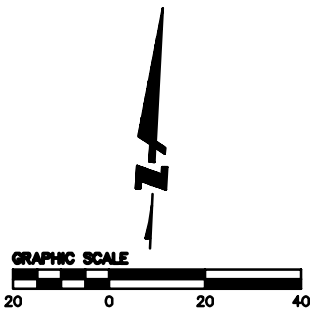
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

LEGEND

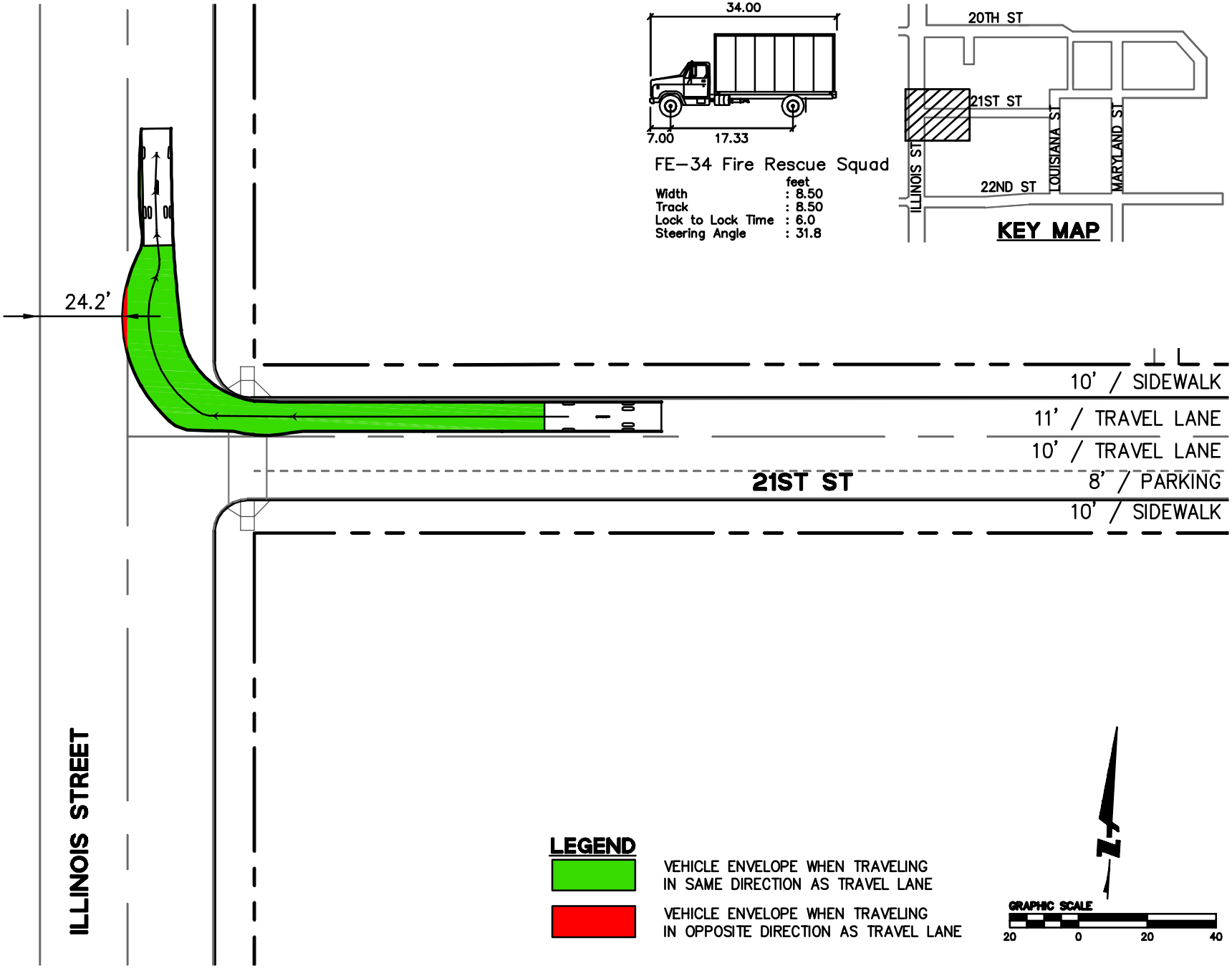
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



FE–34 Fire Rescue Squad

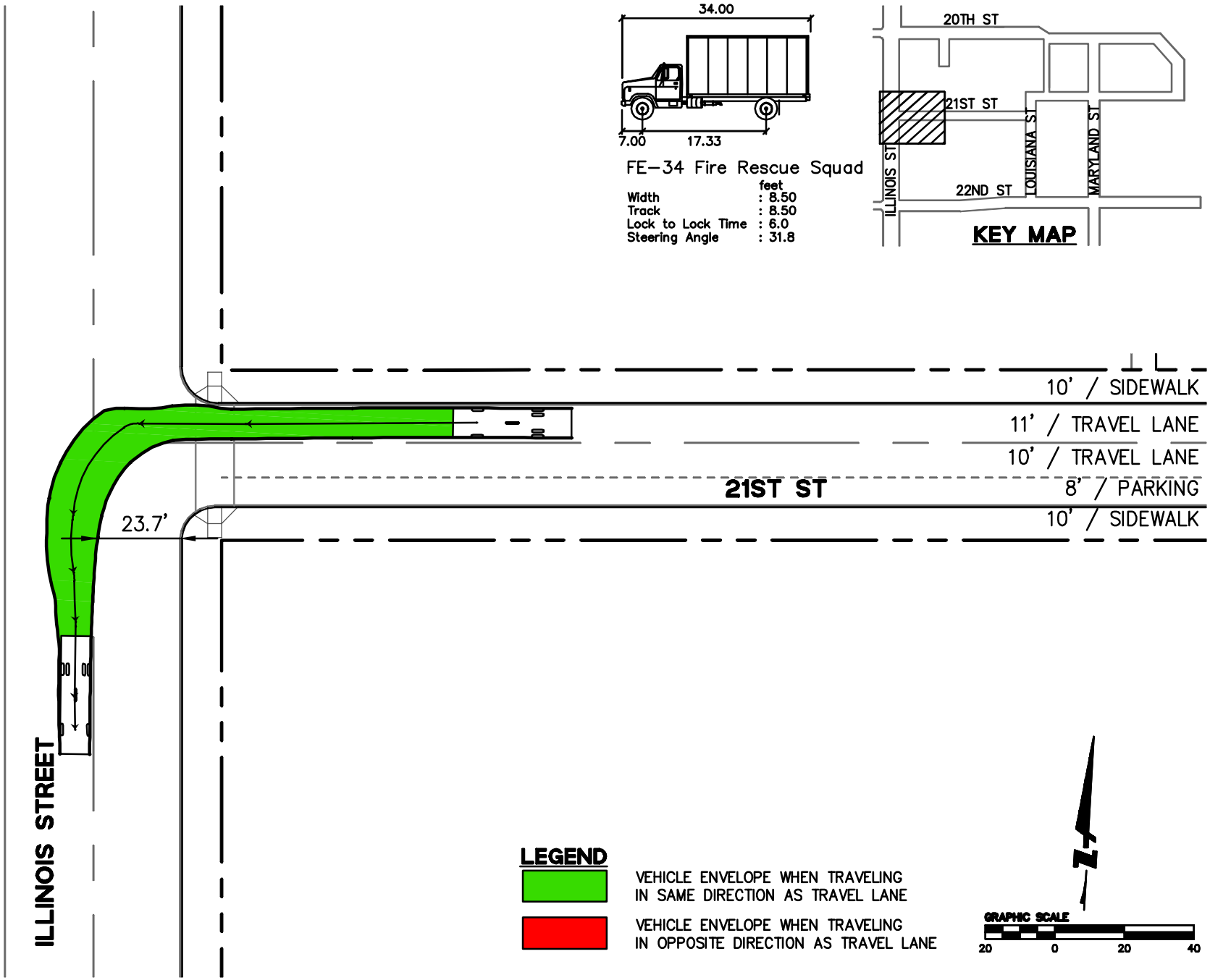
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

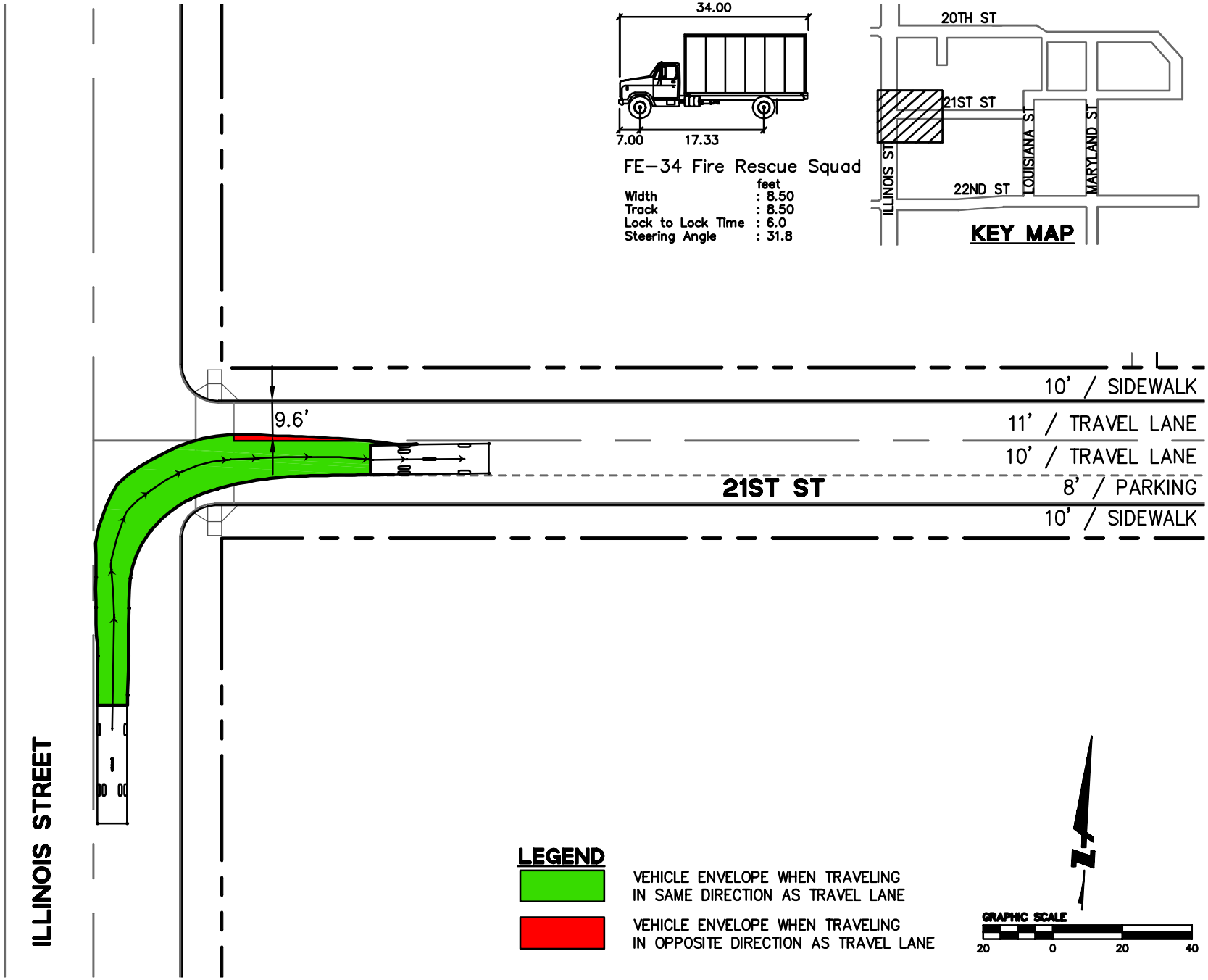


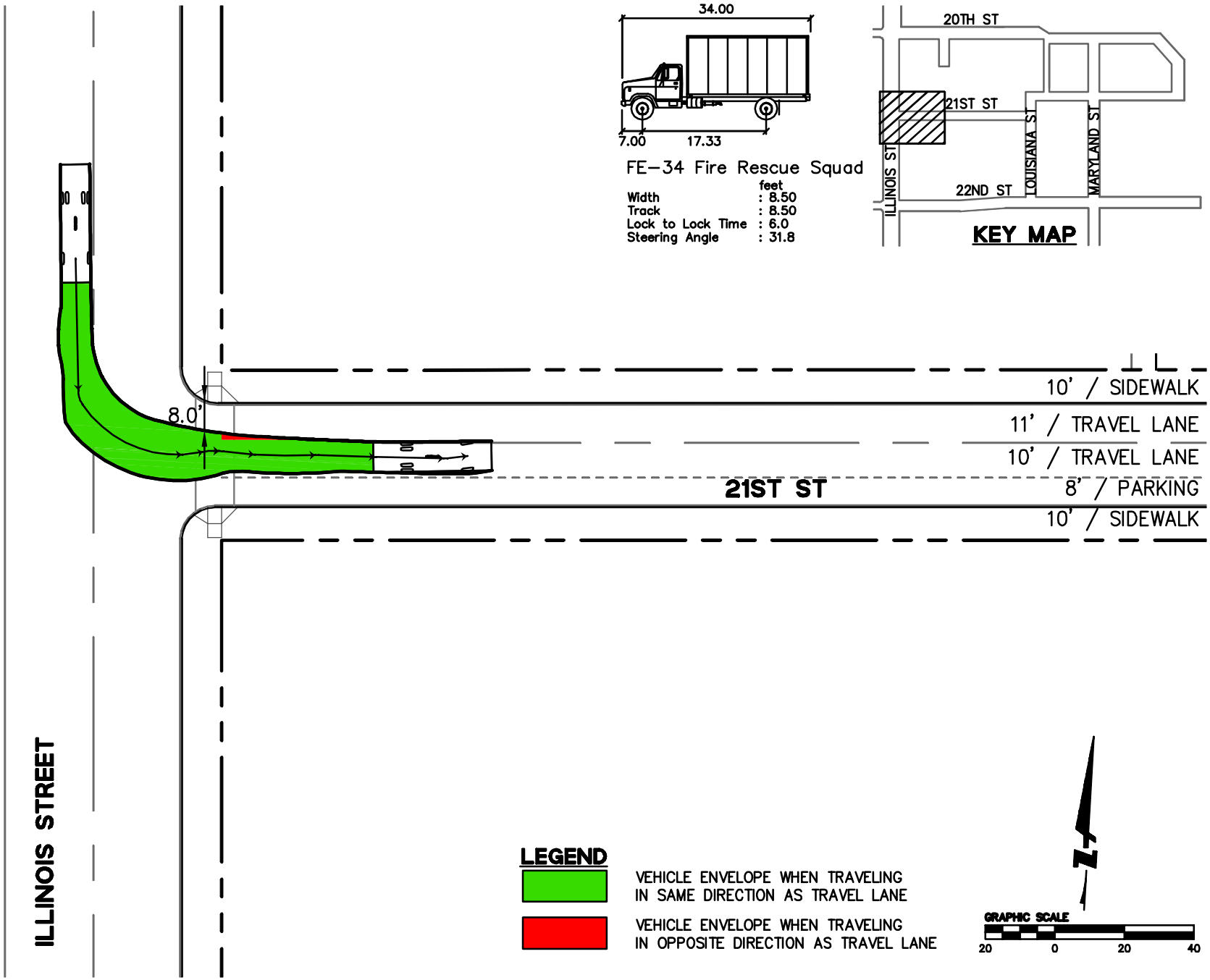
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

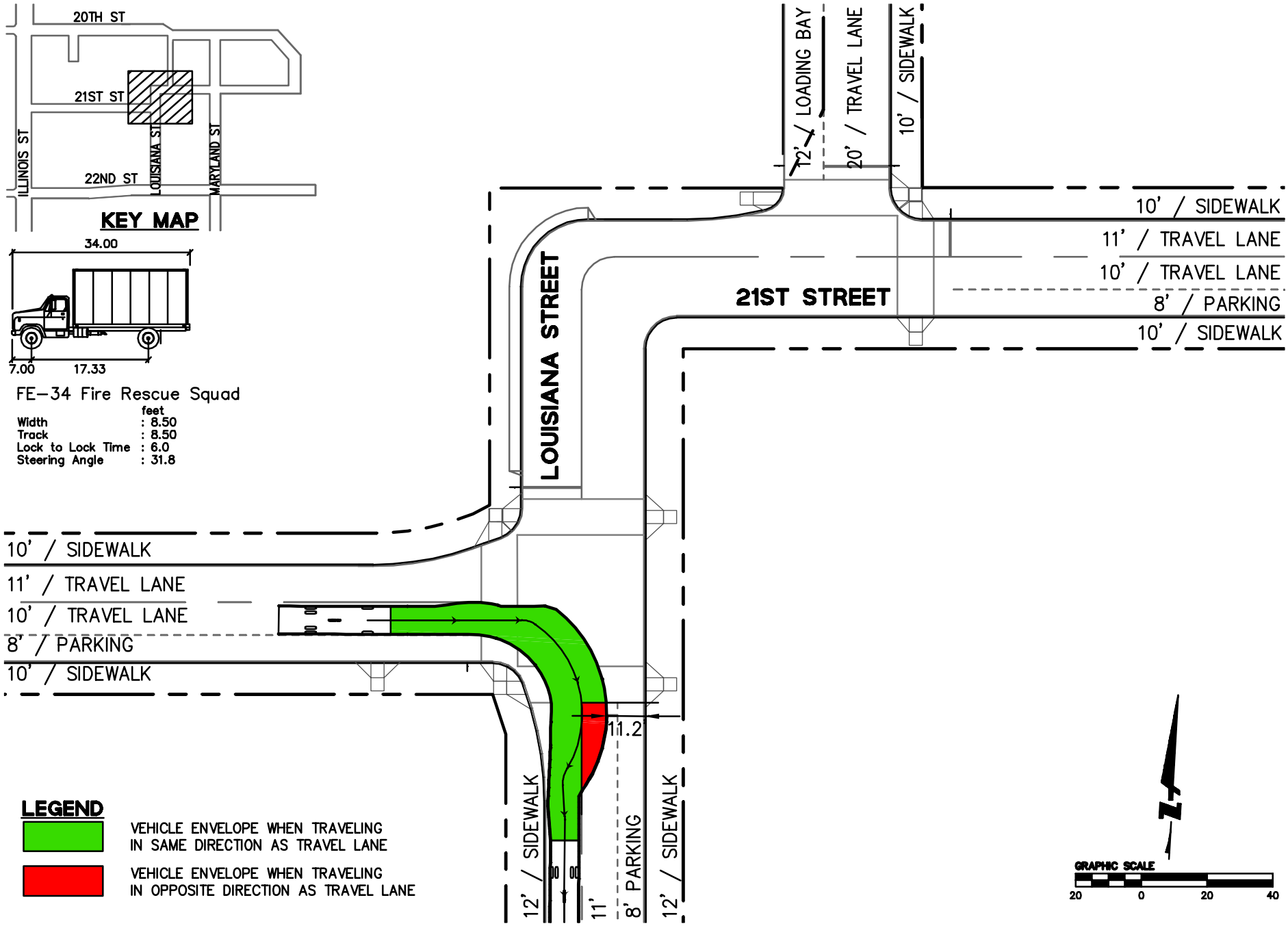

34.00
7.00
17.33
FE–34 Fire Rescue Squad
feet
Width : 8.50
Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 31.8
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
21ST ST
23.7'
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40


34.00
7.00
17.33
FE–34 Fire Rescue Squad
feet
Width : 8.50
Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 31.8
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
21ST ST
9.6'
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40


34.00
7.00
17.33
FE–34 Fire Rescue Squad
feet
Width : 8.50
Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 31.8
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
8.0'
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
21ST ST
8' / PARKING
10' / SIDEWALK
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40

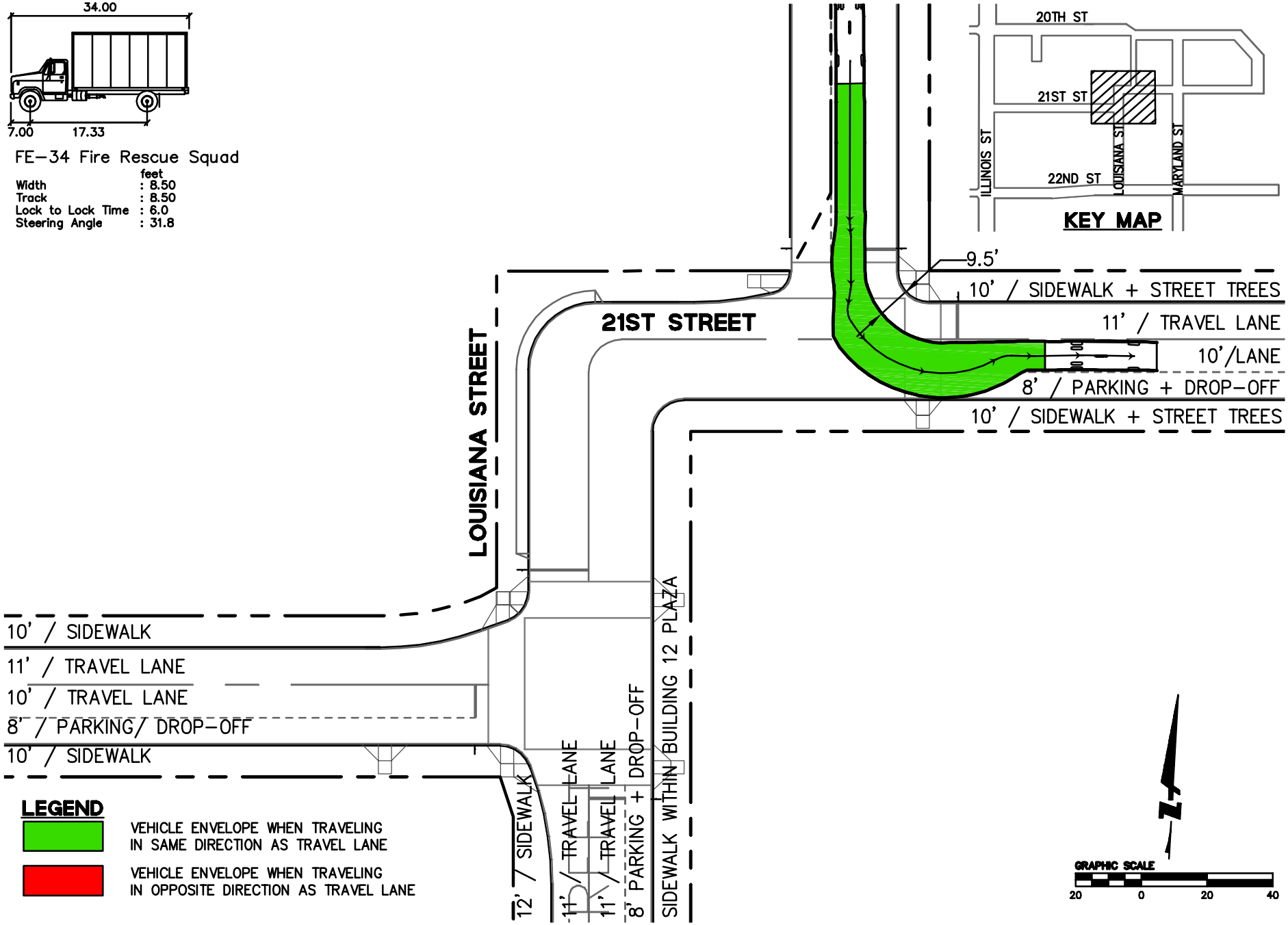
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



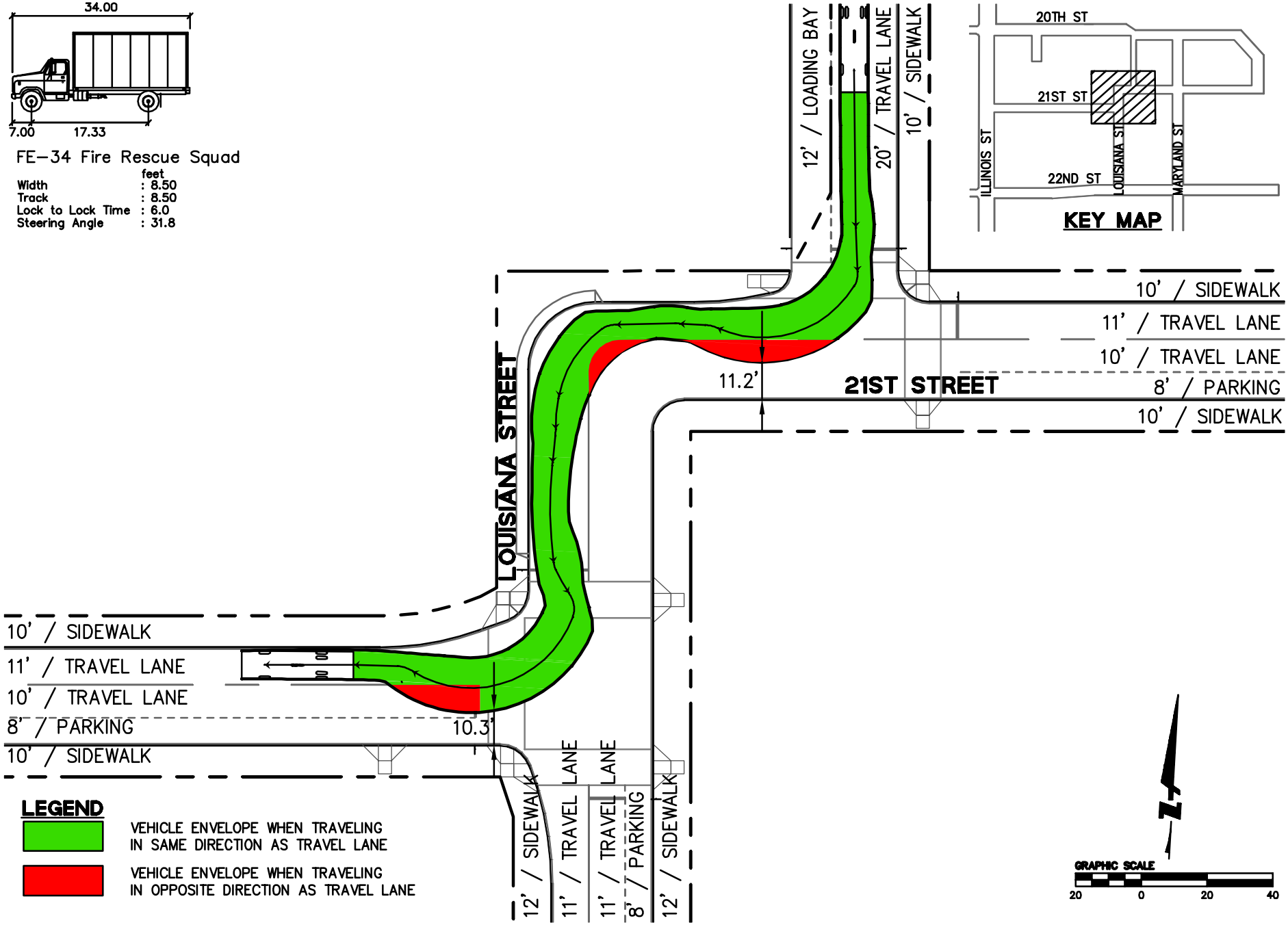
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



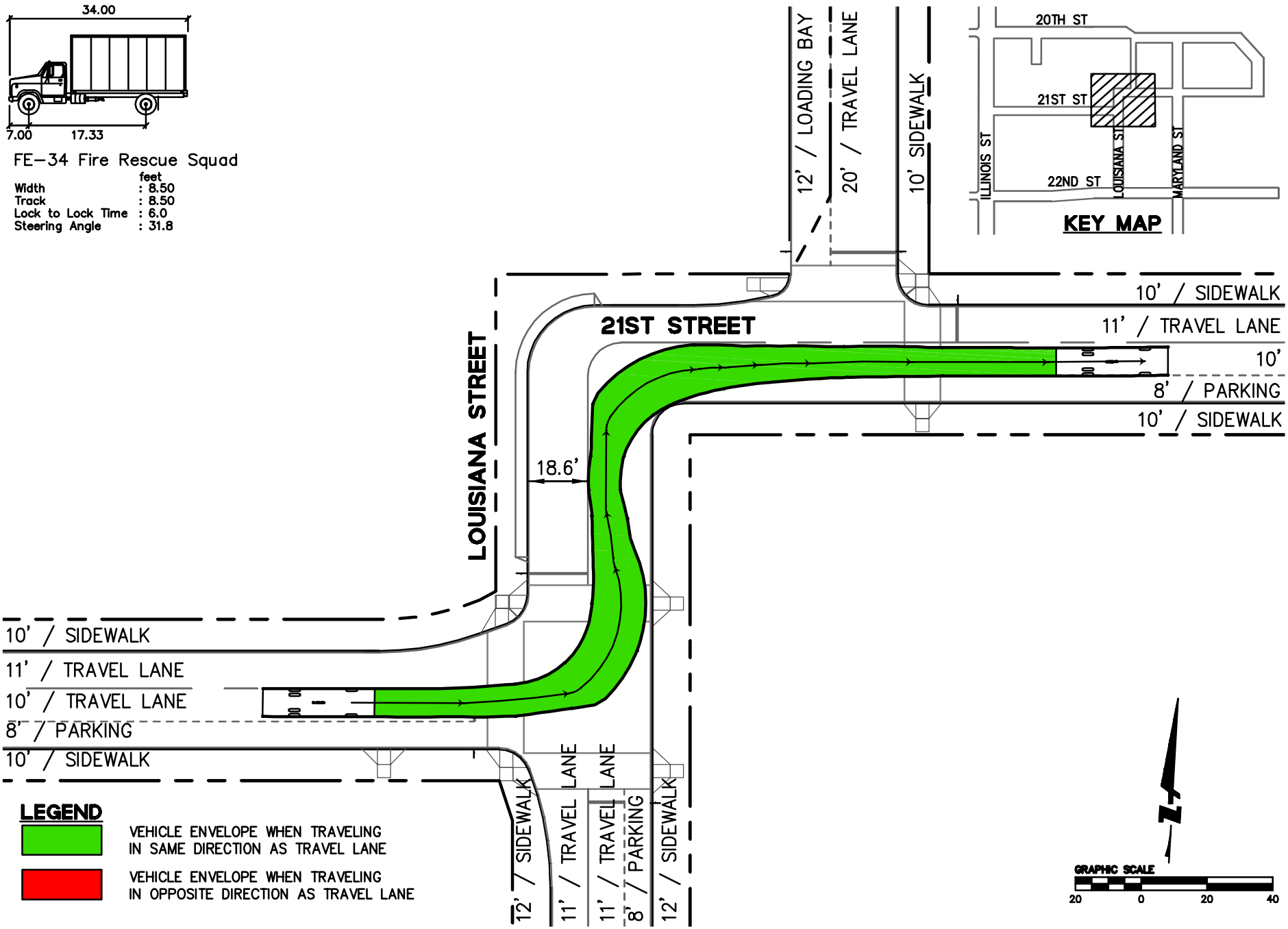
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



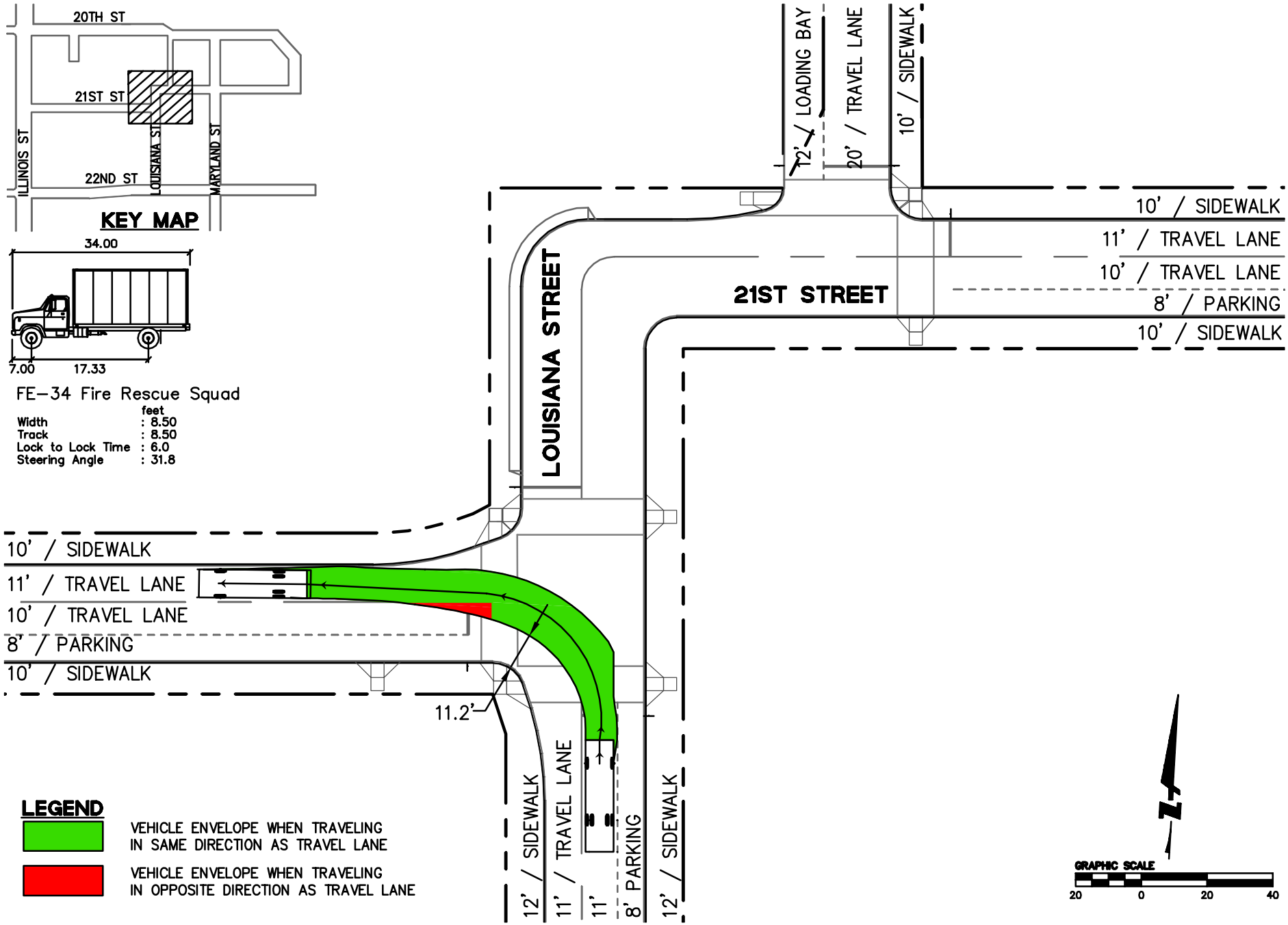
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



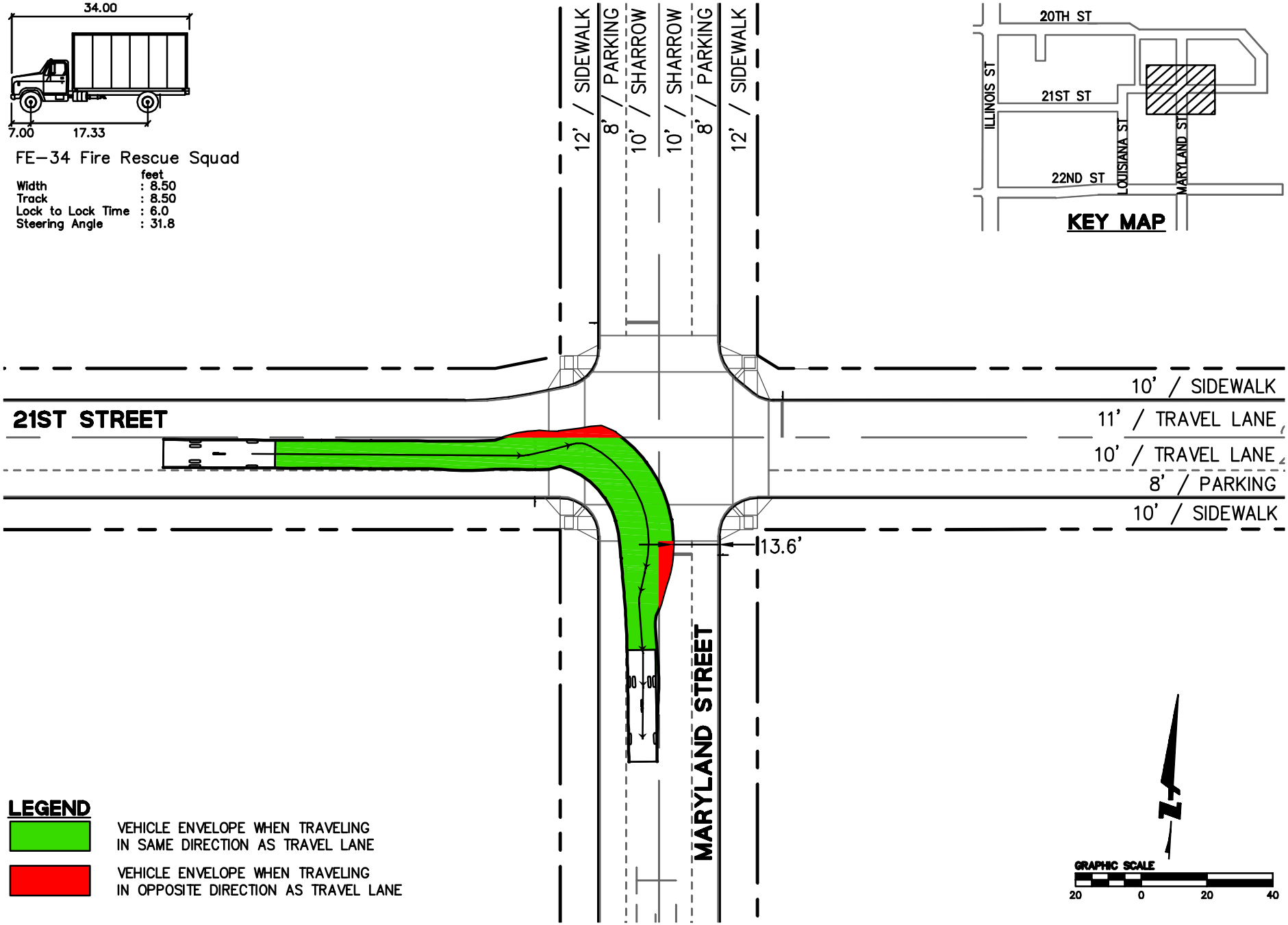
LEGEND

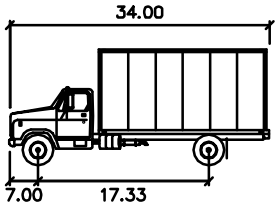
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

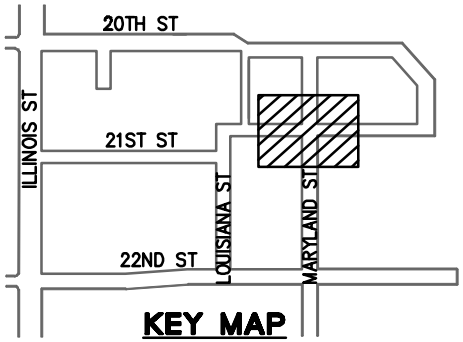
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



MARYLAND STREET

14.8'

21ST STREET

10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

LEGEND

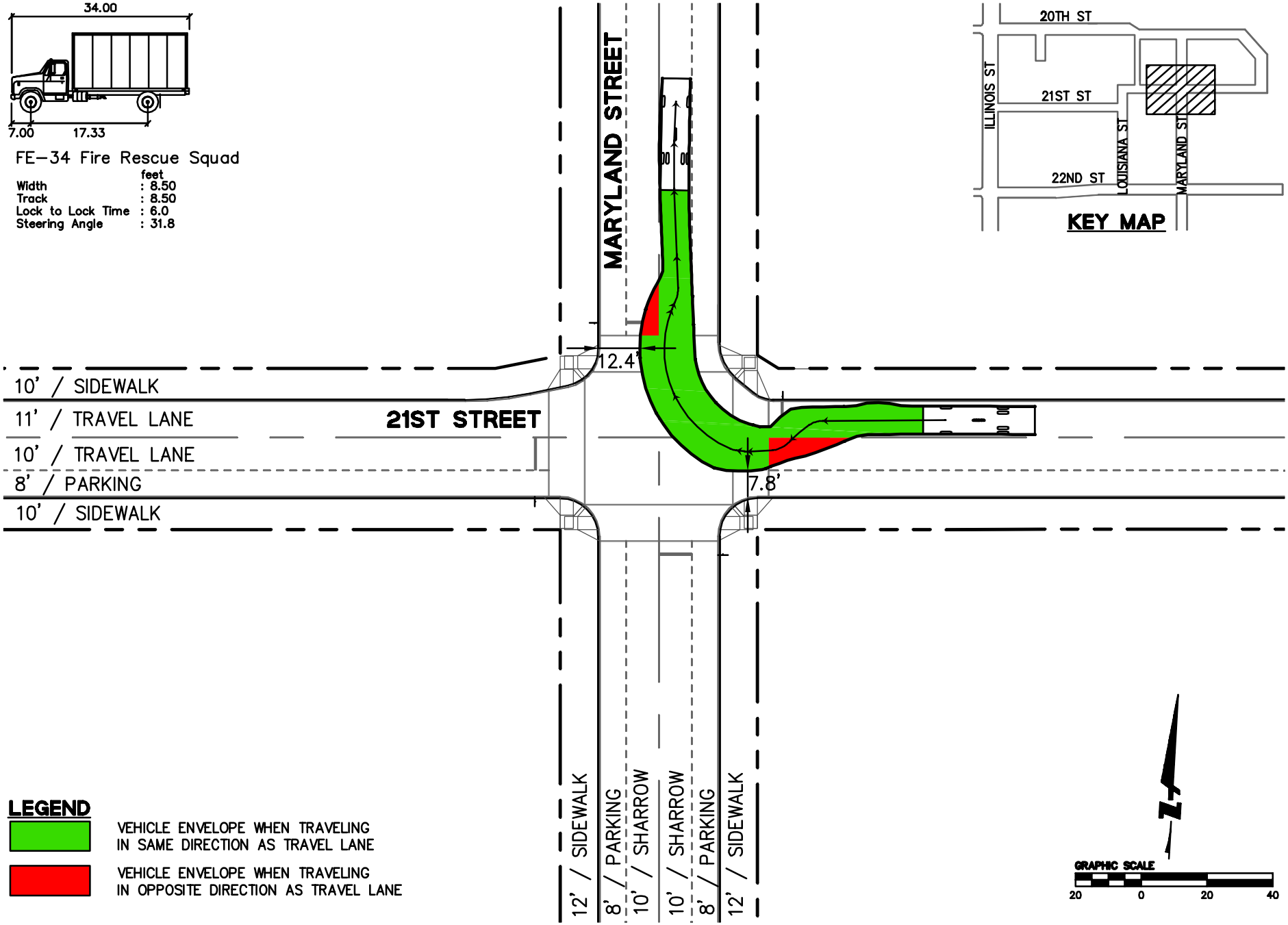
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



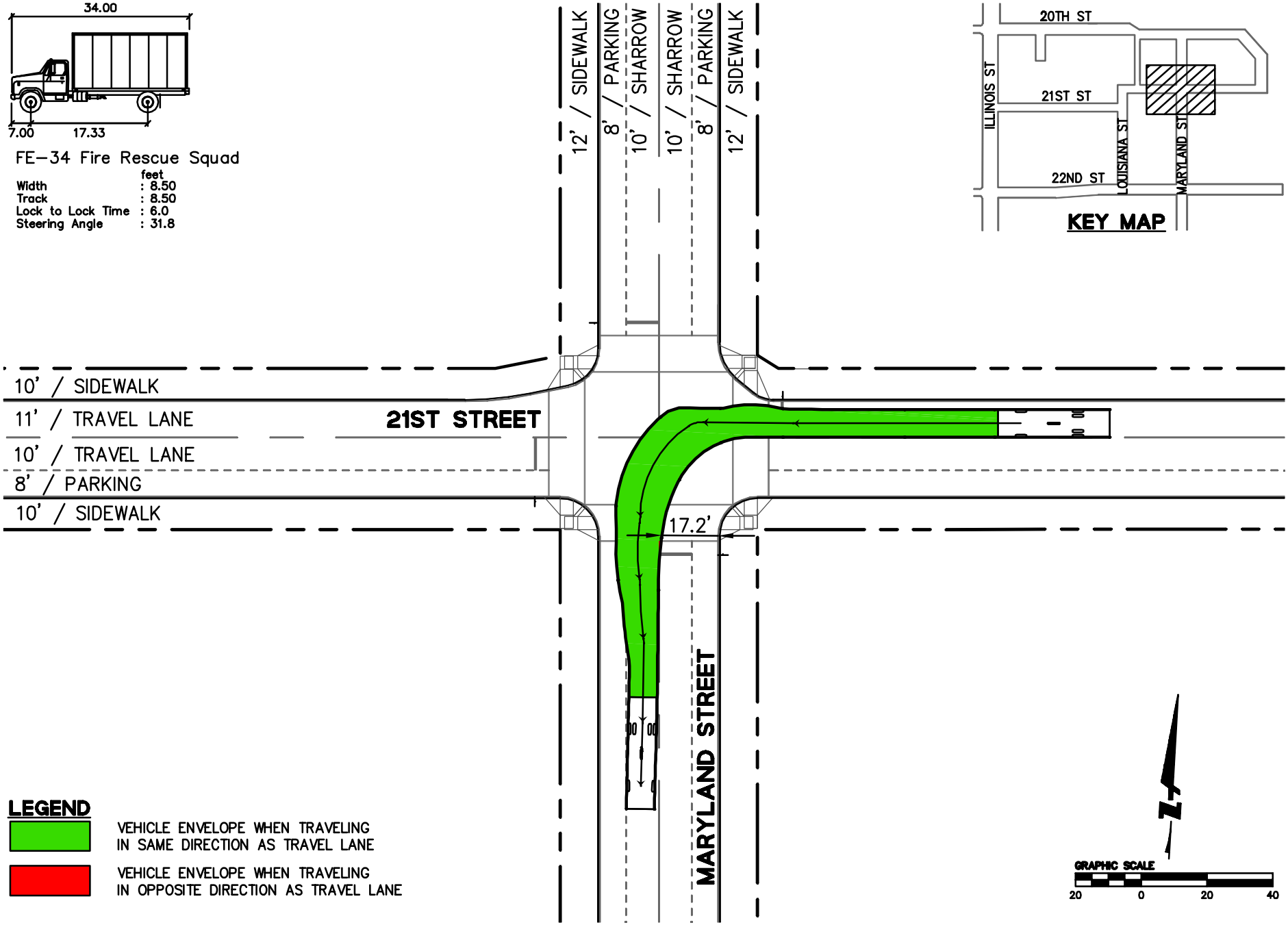
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

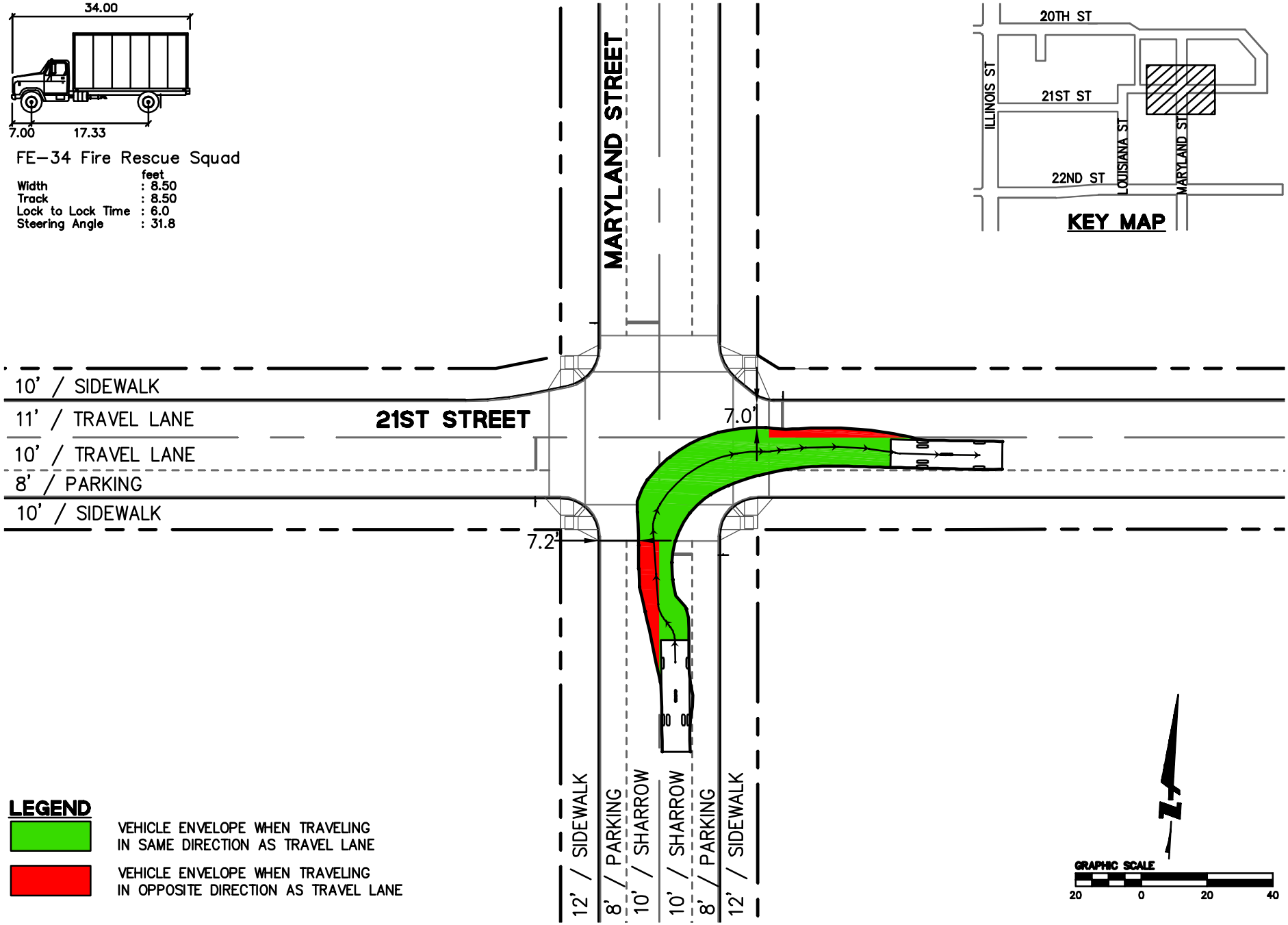
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



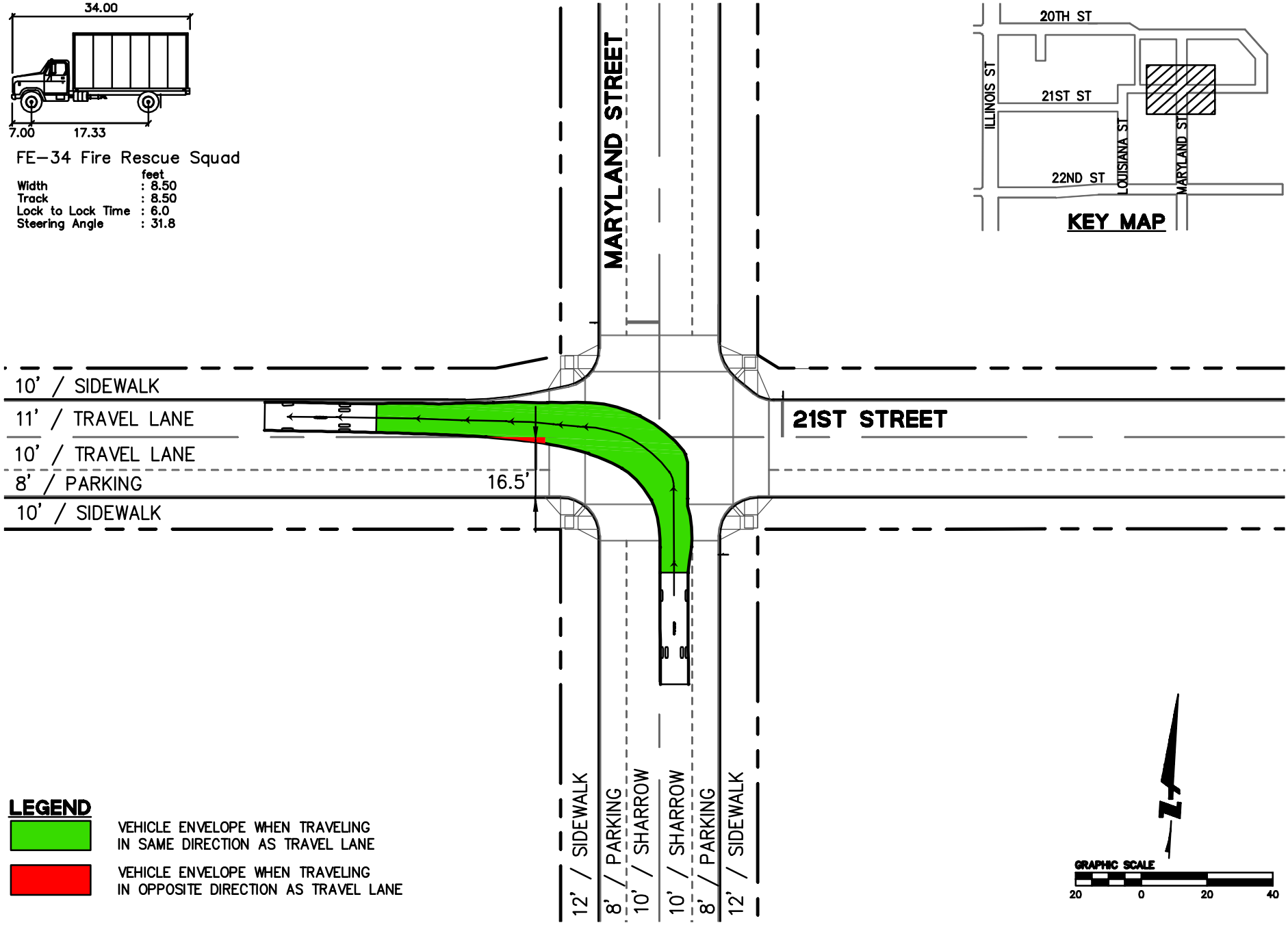
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

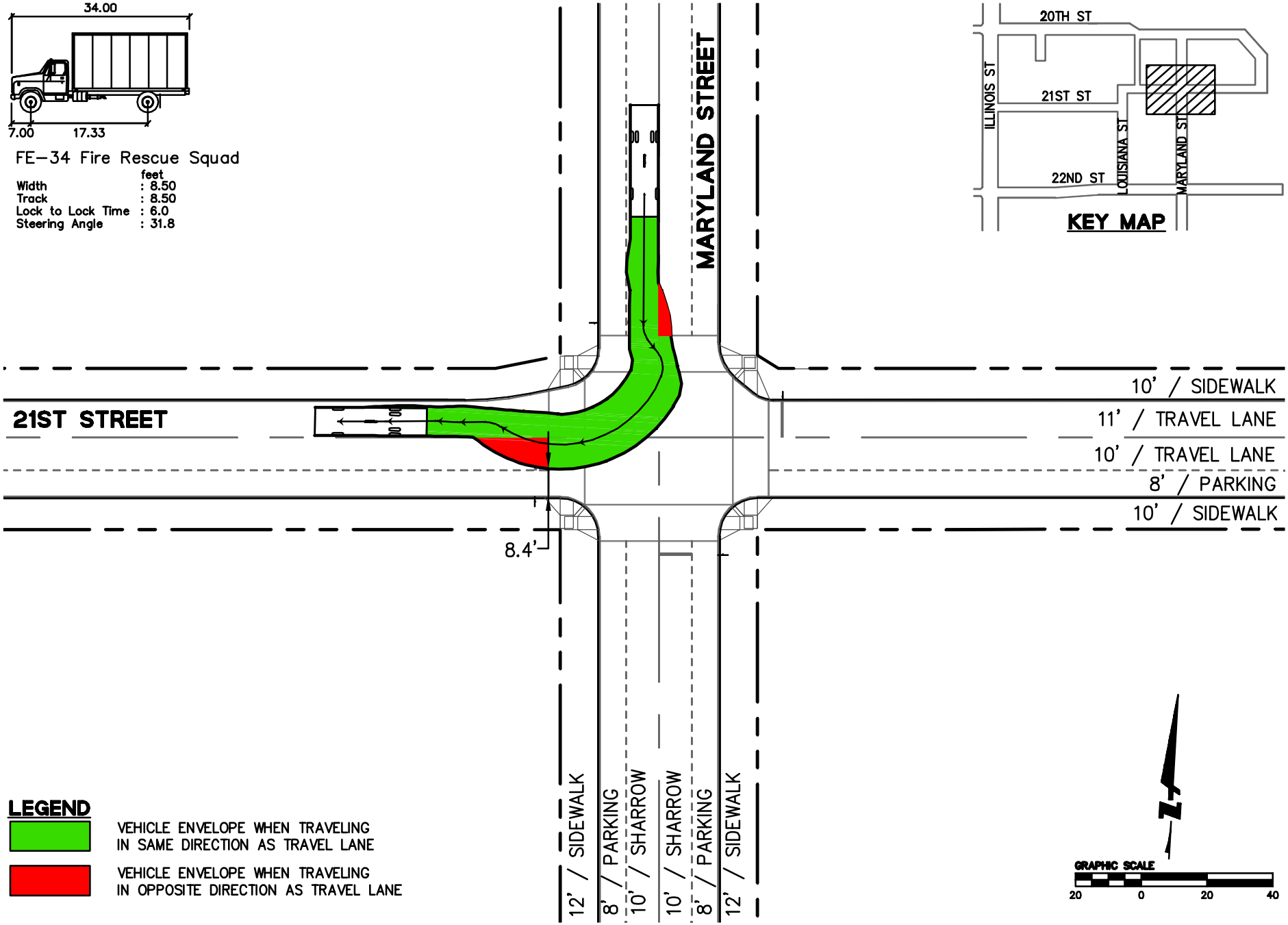
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



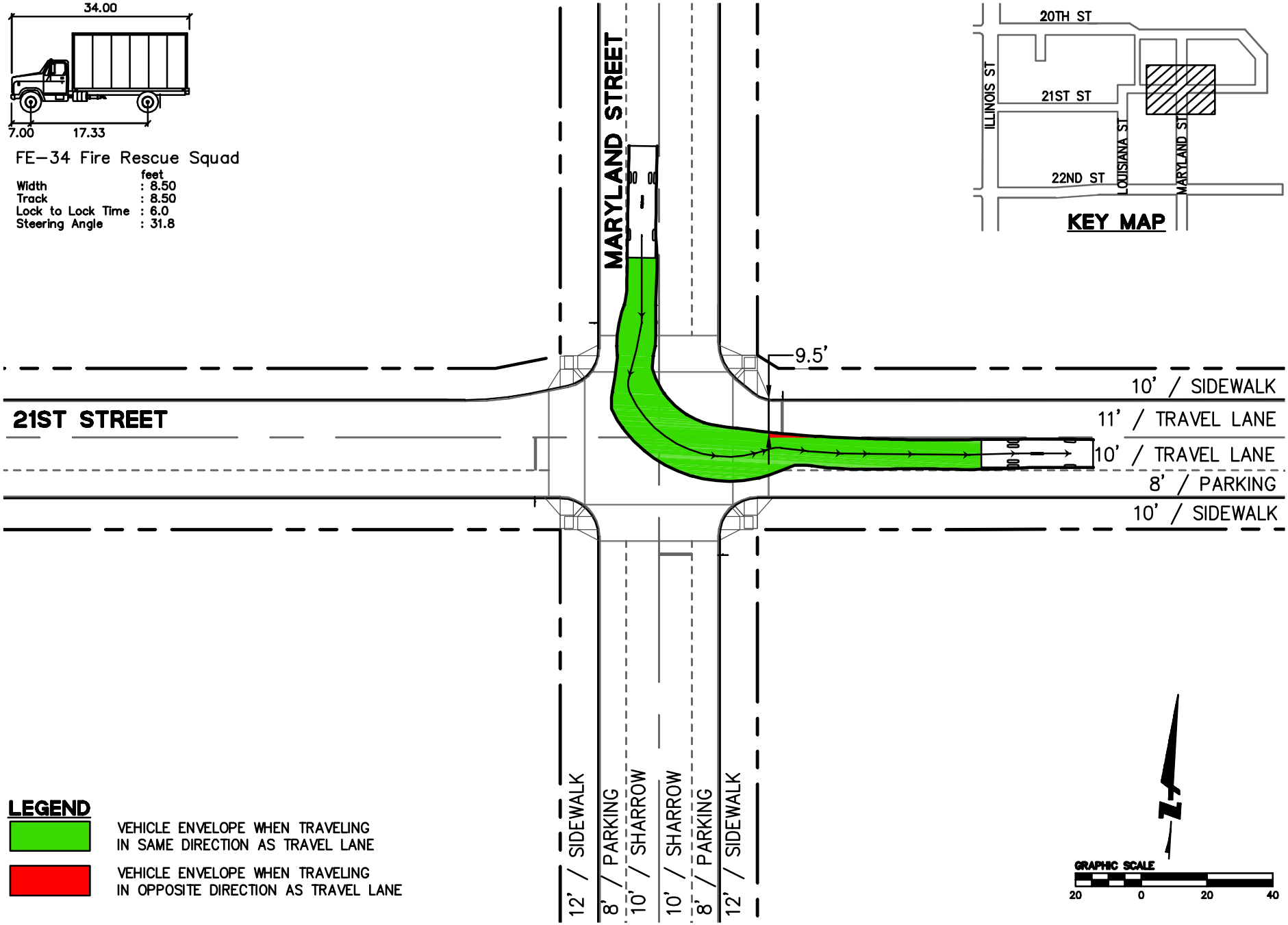
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

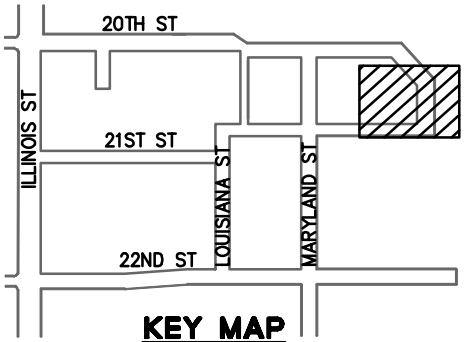
FE–34 Fire Rescue Squad

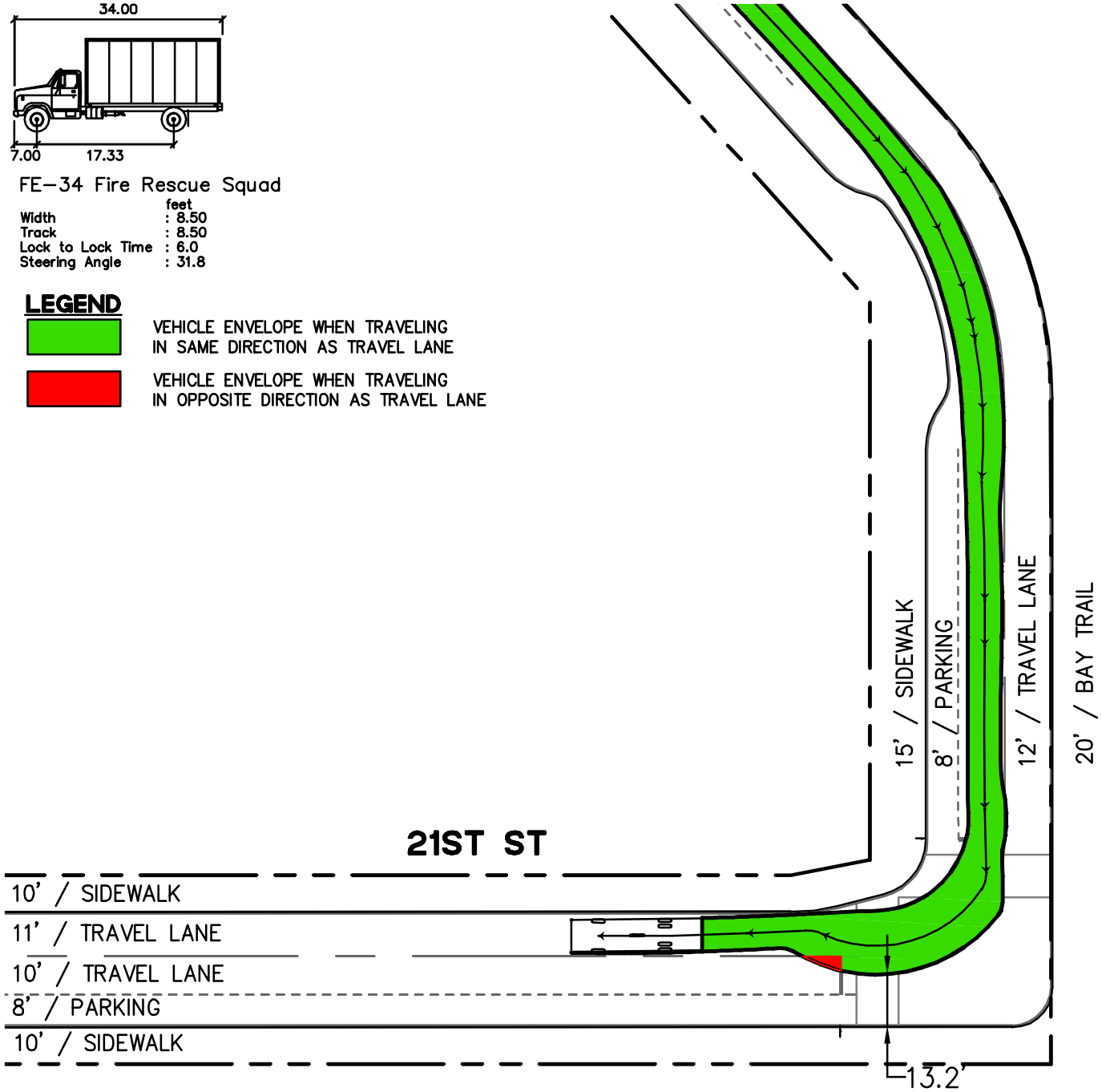
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

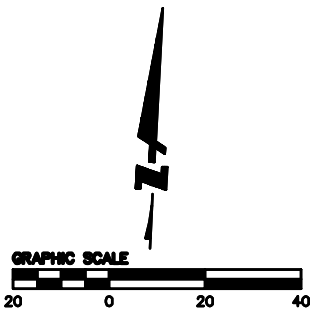
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE







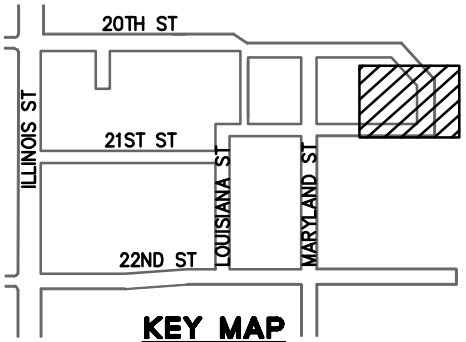
FE–34 Fire Rescue Squad

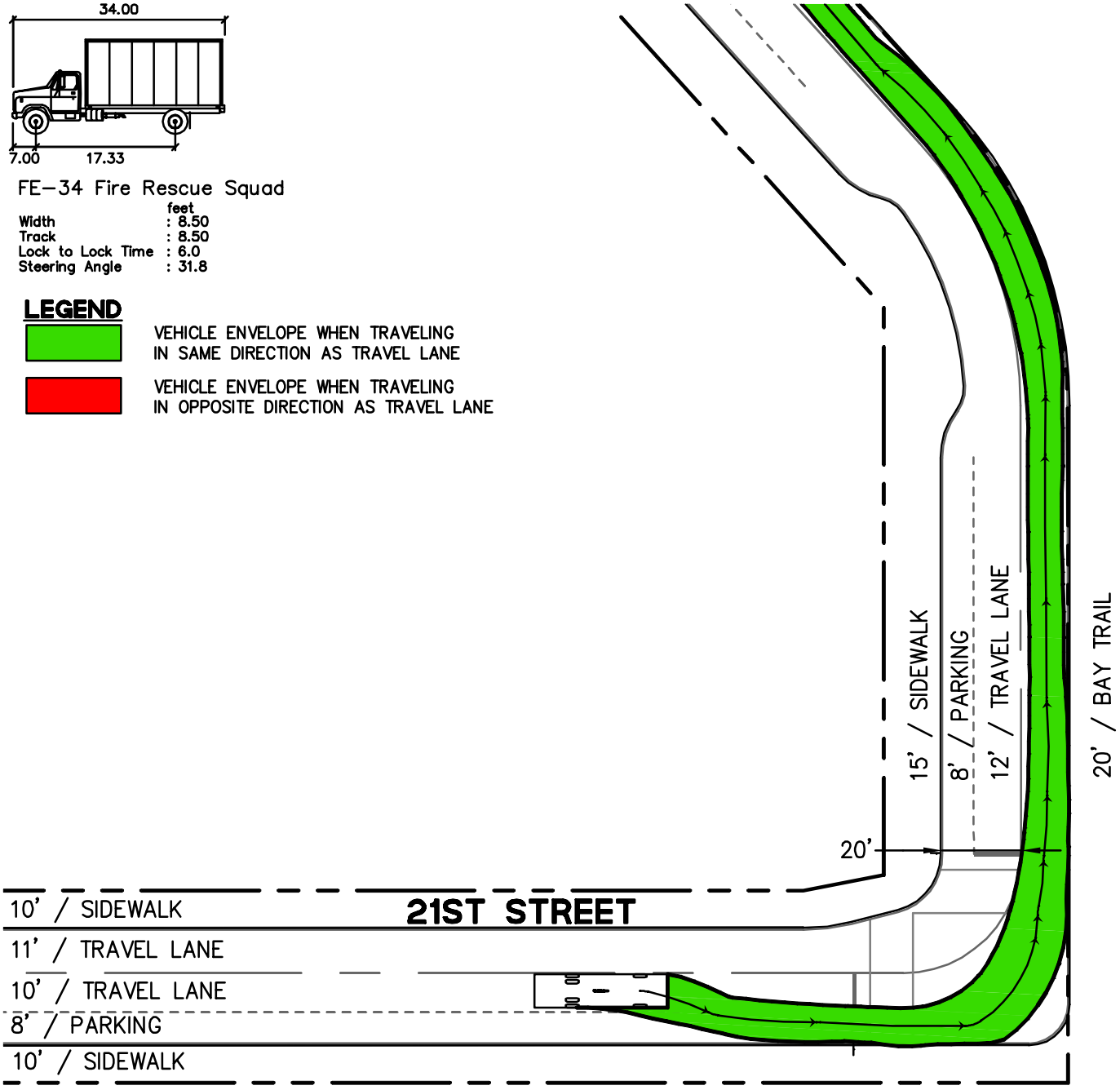
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

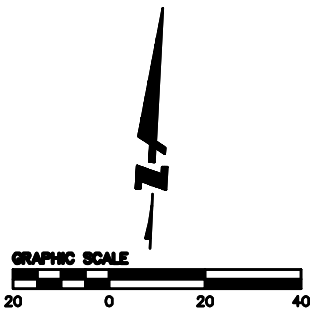
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

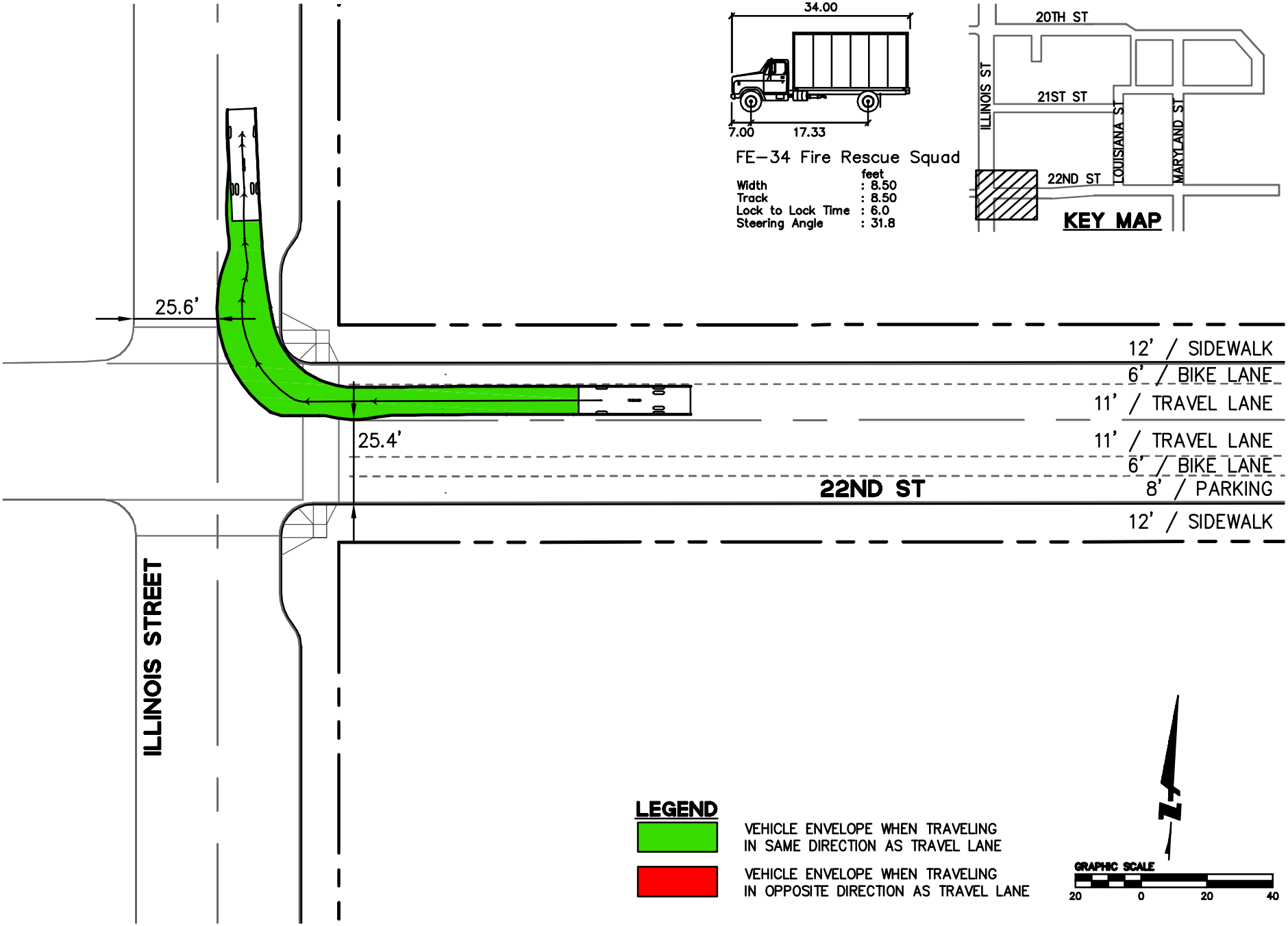






FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



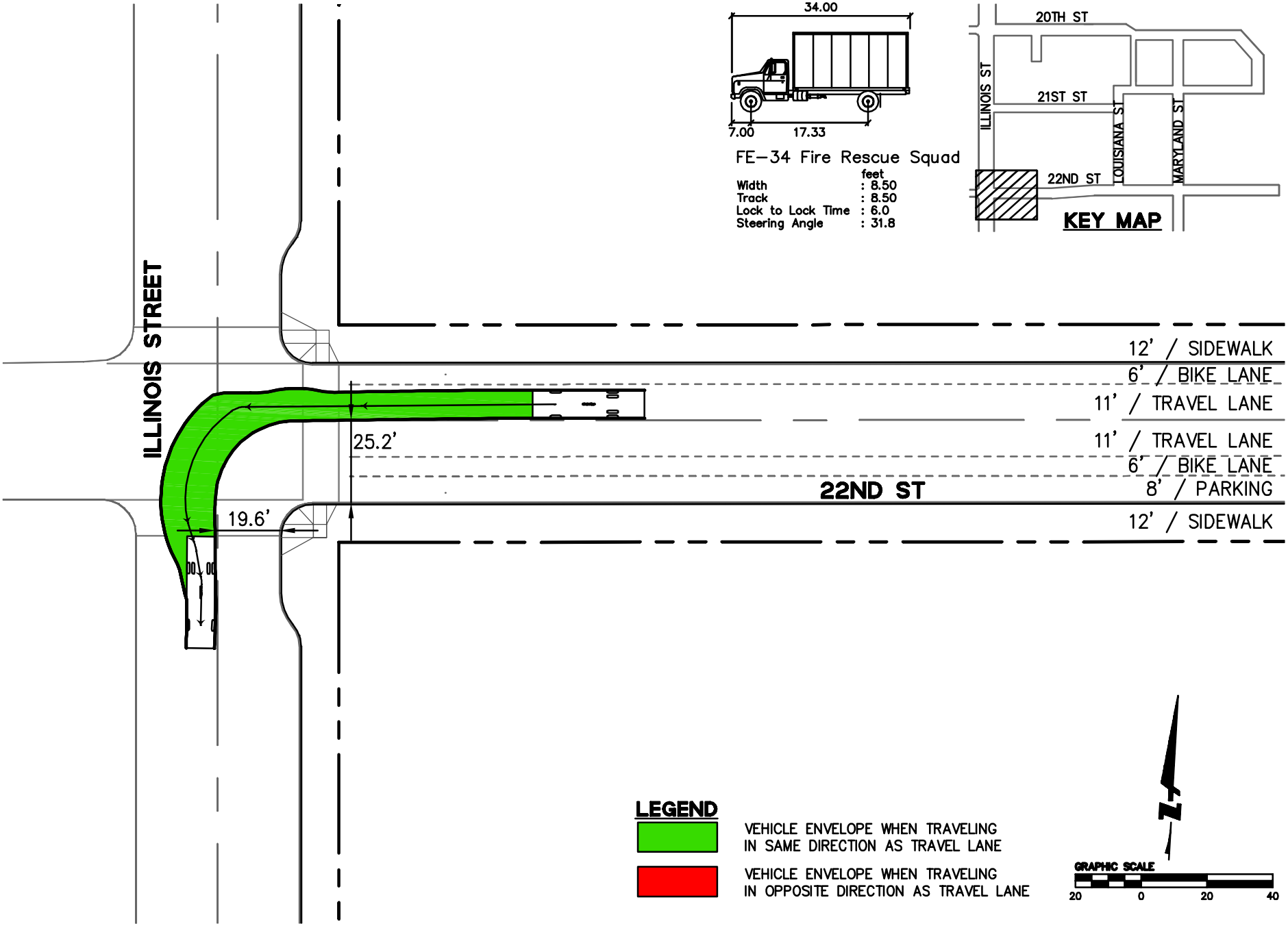
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

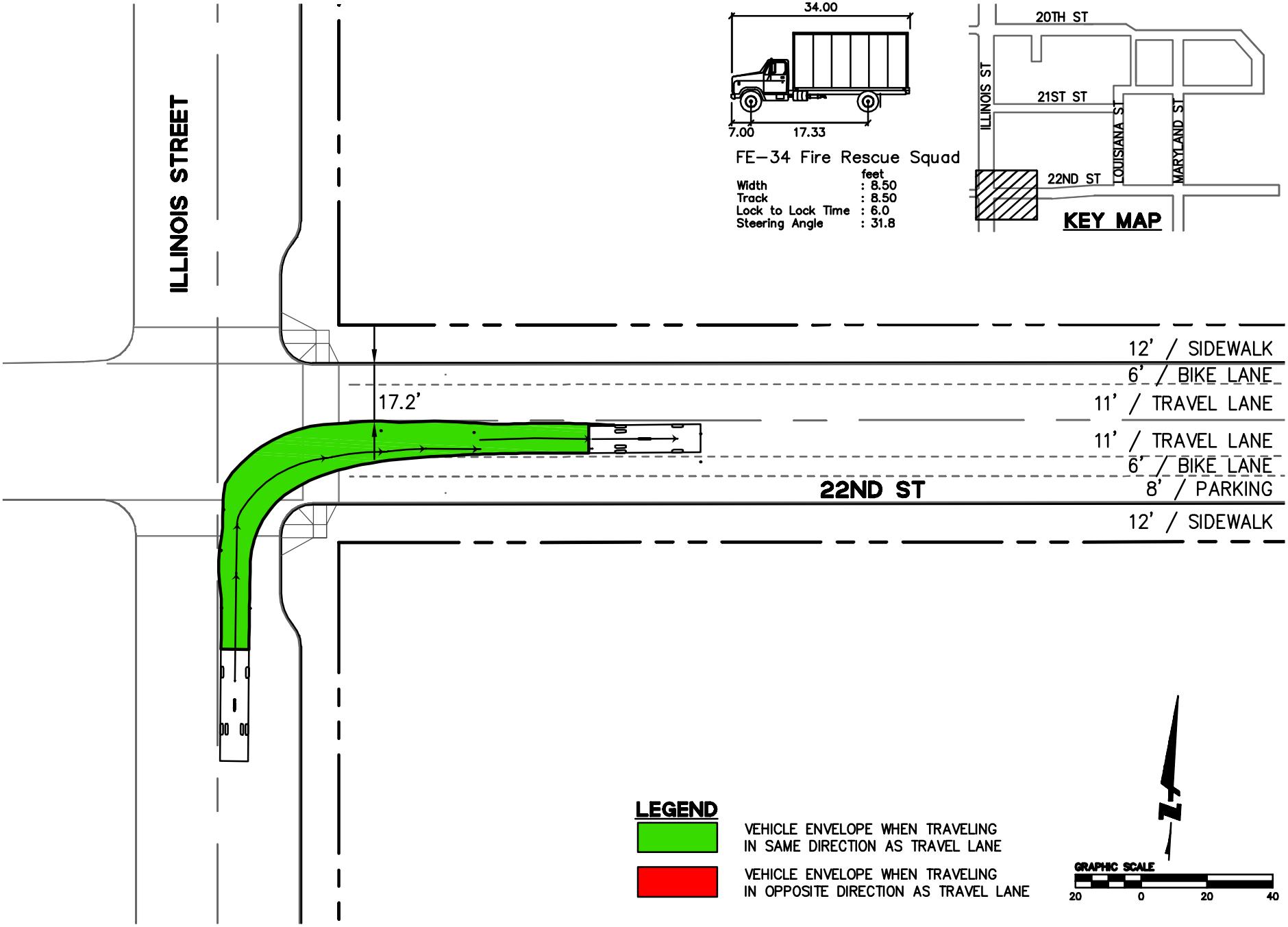
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



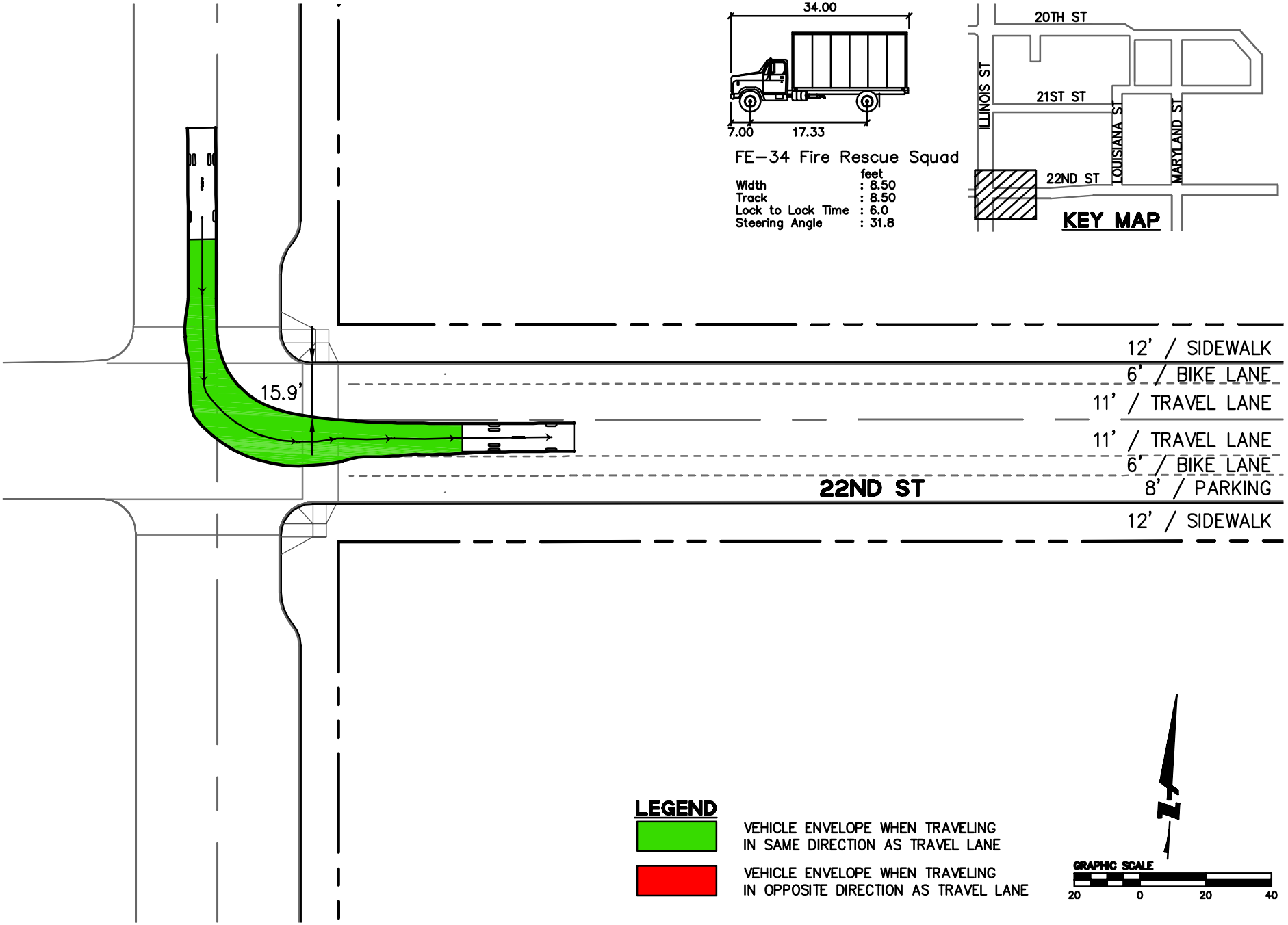
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



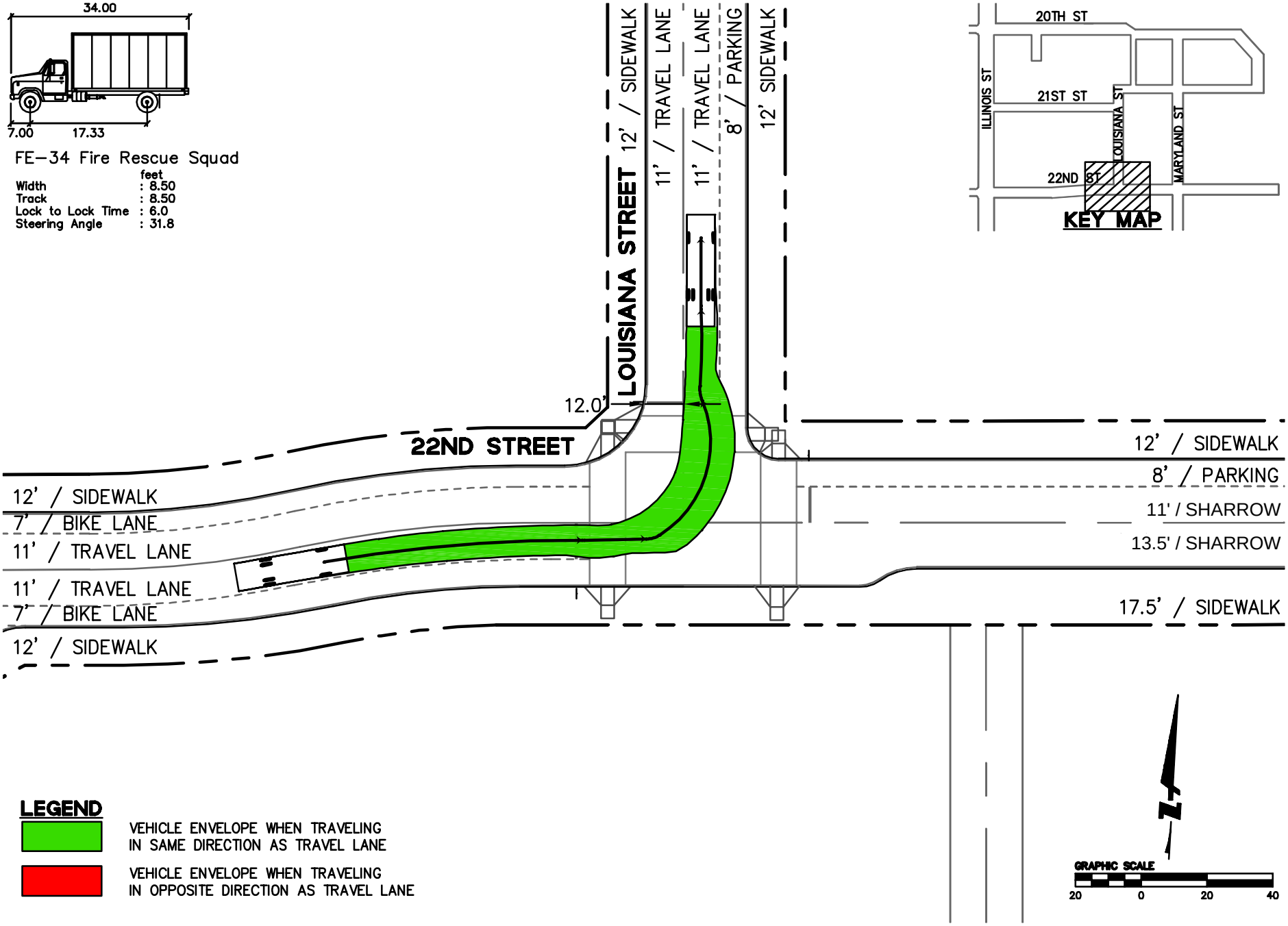
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



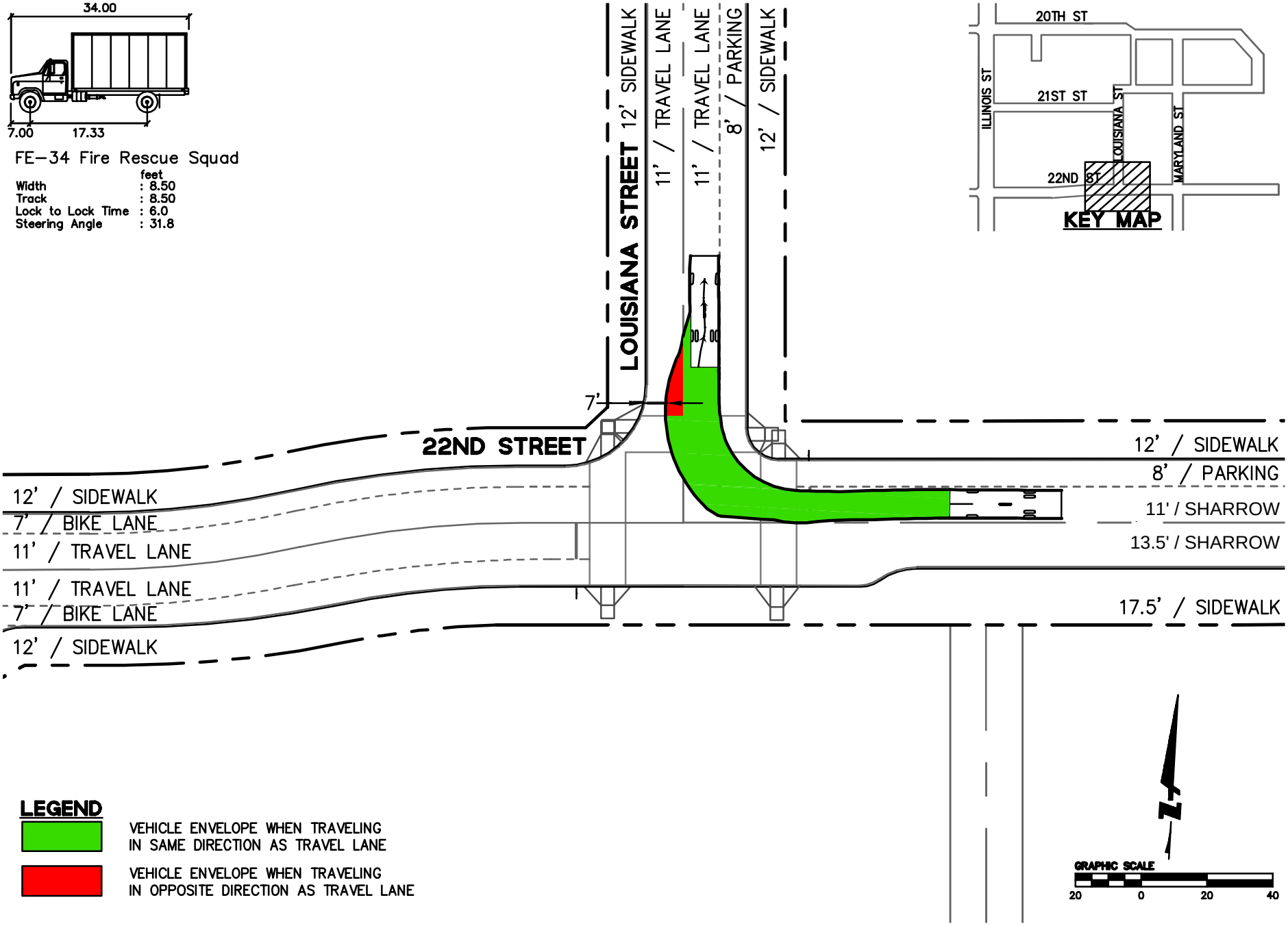
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



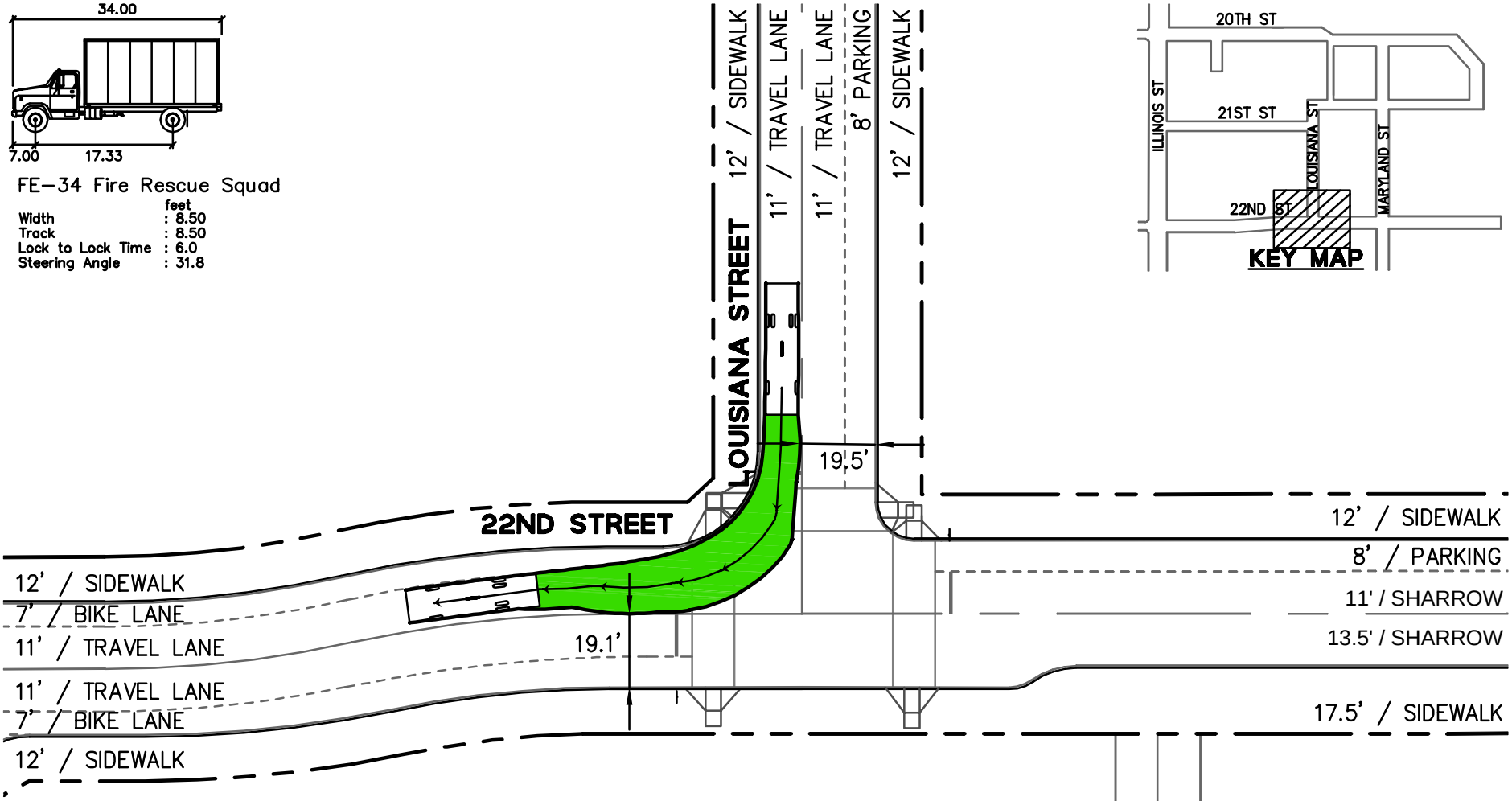
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

FE–34 Fire Rescue Squad

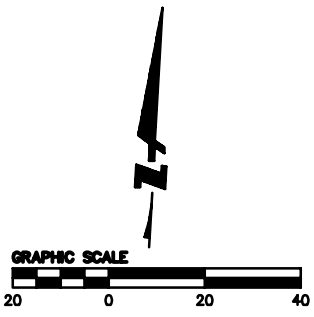
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



LEGEND

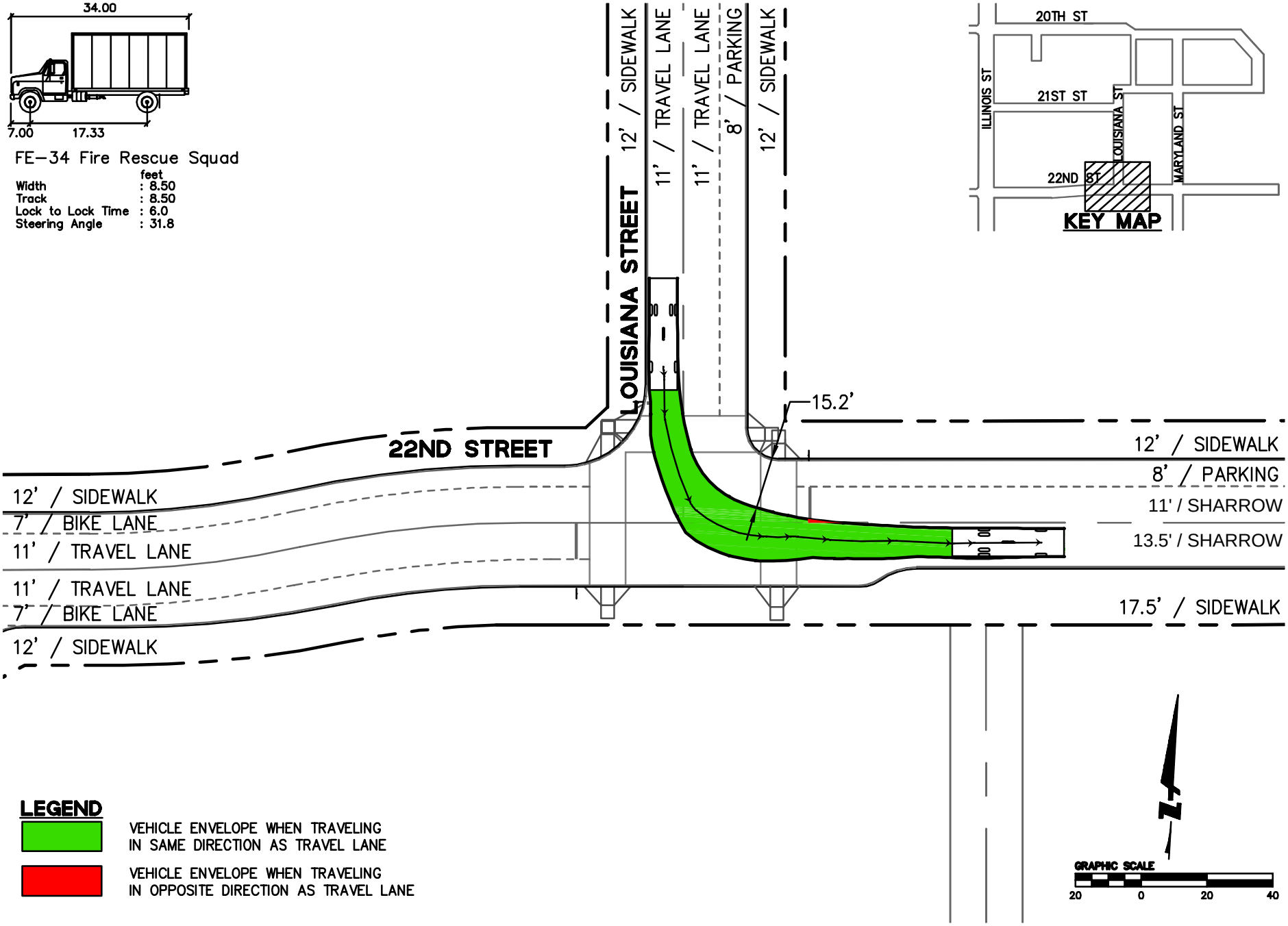
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

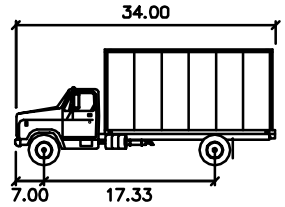
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



FE–34 Fire Rescue Squad

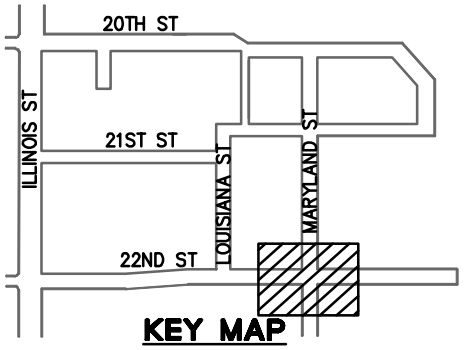
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK

22ND STREET

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

10.4'

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

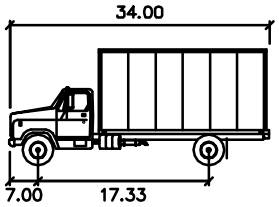
MARYLAND STREET

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

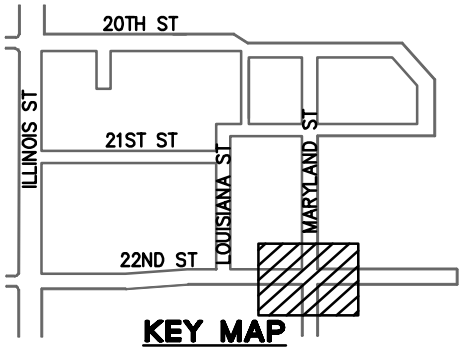
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

MARYLAND STREET

22ND STREET

12.5'

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

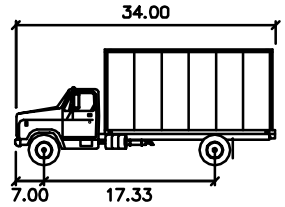
12' / SIDEWALK
8' / PARKING
11' / SHARROW
11' / SHARROW
8' / PARKING
12' / SIDEWALK

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

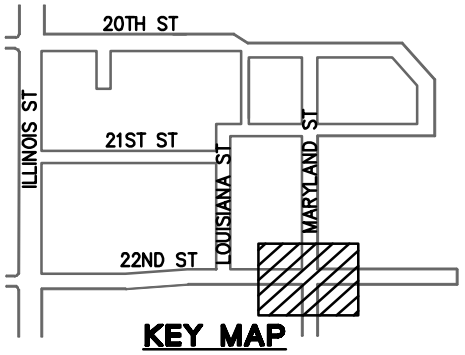
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

MARYLAND STREET

10.0'

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK

22ND STREET

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

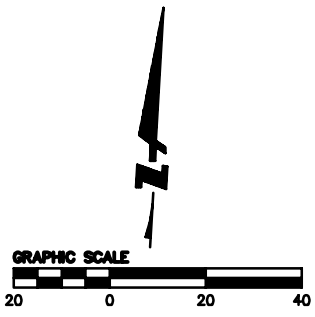
POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

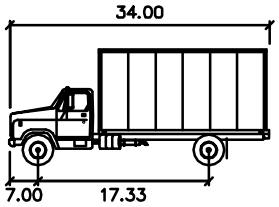
12' / SIDEWALK
8' / PARKING
11' / SHARROW
11' / SHARROW
8' / PARKING
12' / SIDEWALK

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

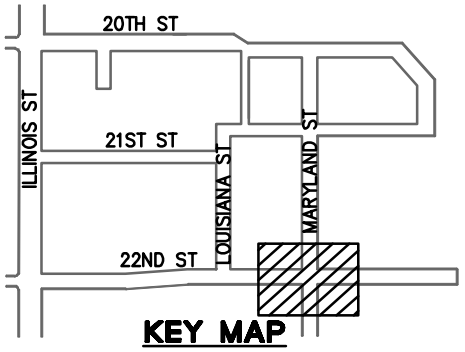
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK

22ND STREET

12' / SIDEWALK
8' / PARKING
10'
10' / SHARROW
8' / PARKING
12' / SIDEWALK

14.2'

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

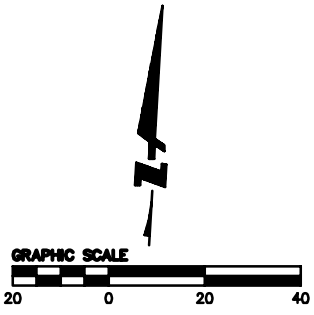
POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

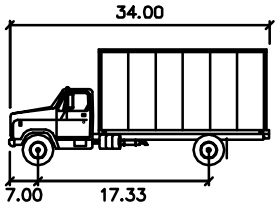
MARYLAND STREET

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

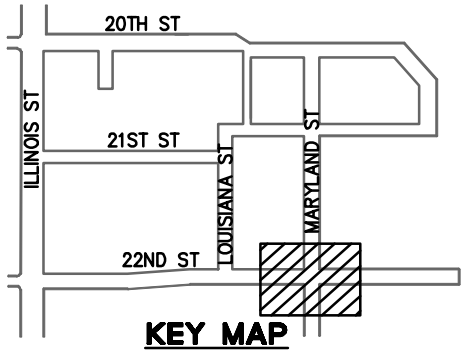
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

MARYLAND STREET

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW

22ND STREET

15.5'

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

17.5' / TRAVEL LANE

8.1'

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

12' / SIDEWALK
8' / PARKING
11' / SHARROW
11'
8' / PARKING
12' / SIDEWALK

LEGEND

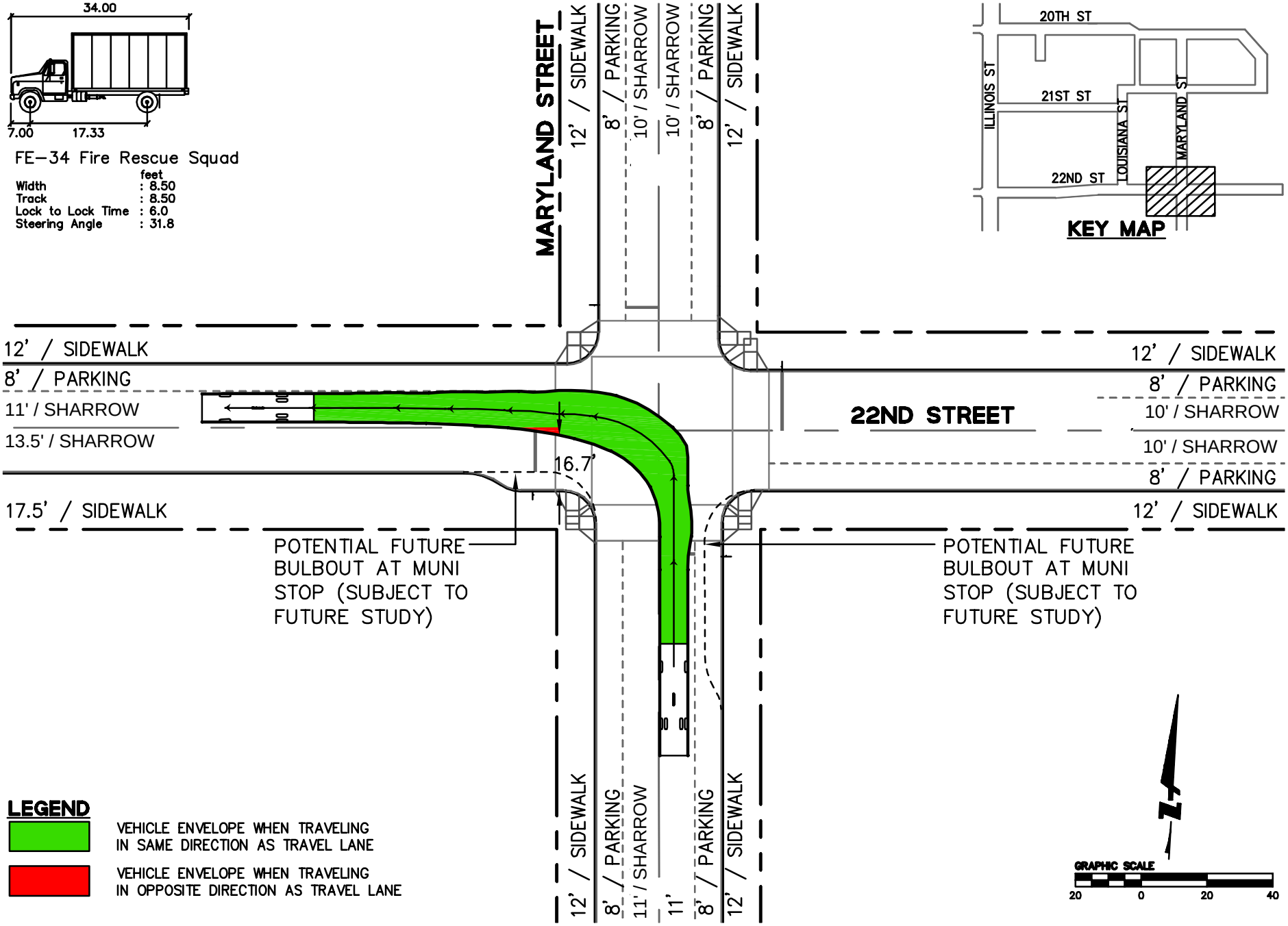
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40

FE–34 Fire Rescue Squad

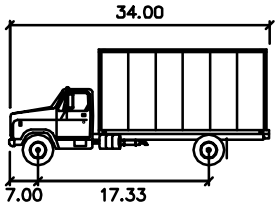
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



LEGEND

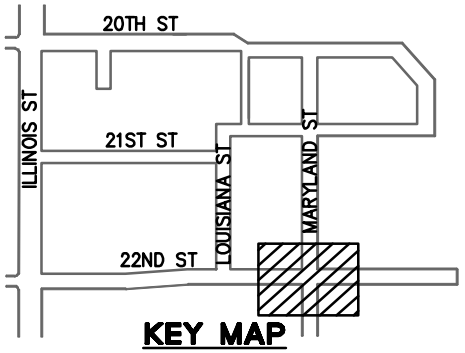
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

MARYLAND STREET

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / TRAVEL LANE

22ND STREET

15.5'
8.1'

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

12' / SIDEWALK
8' / PARKING
11' / SHARROW
11'
8' / PARKING
12' / SIDEWALK

LEGEND

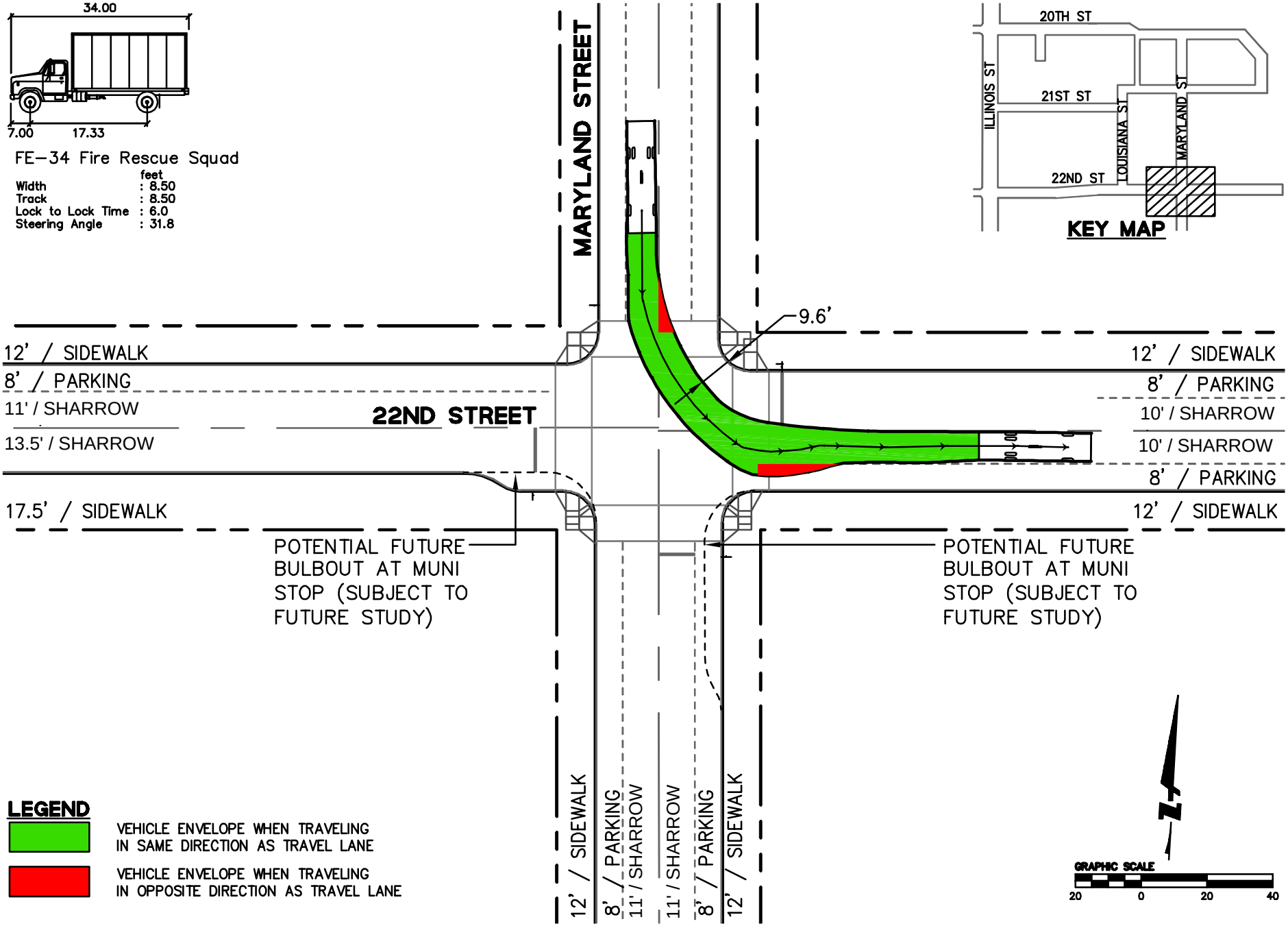
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40

FE–34 Fire Rescue Squad

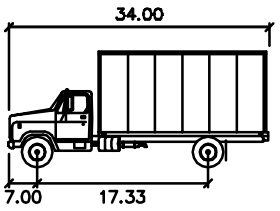
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



LEGEND

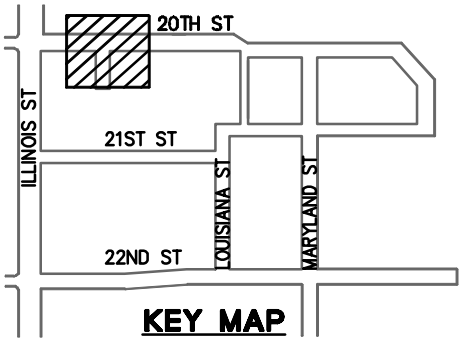
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

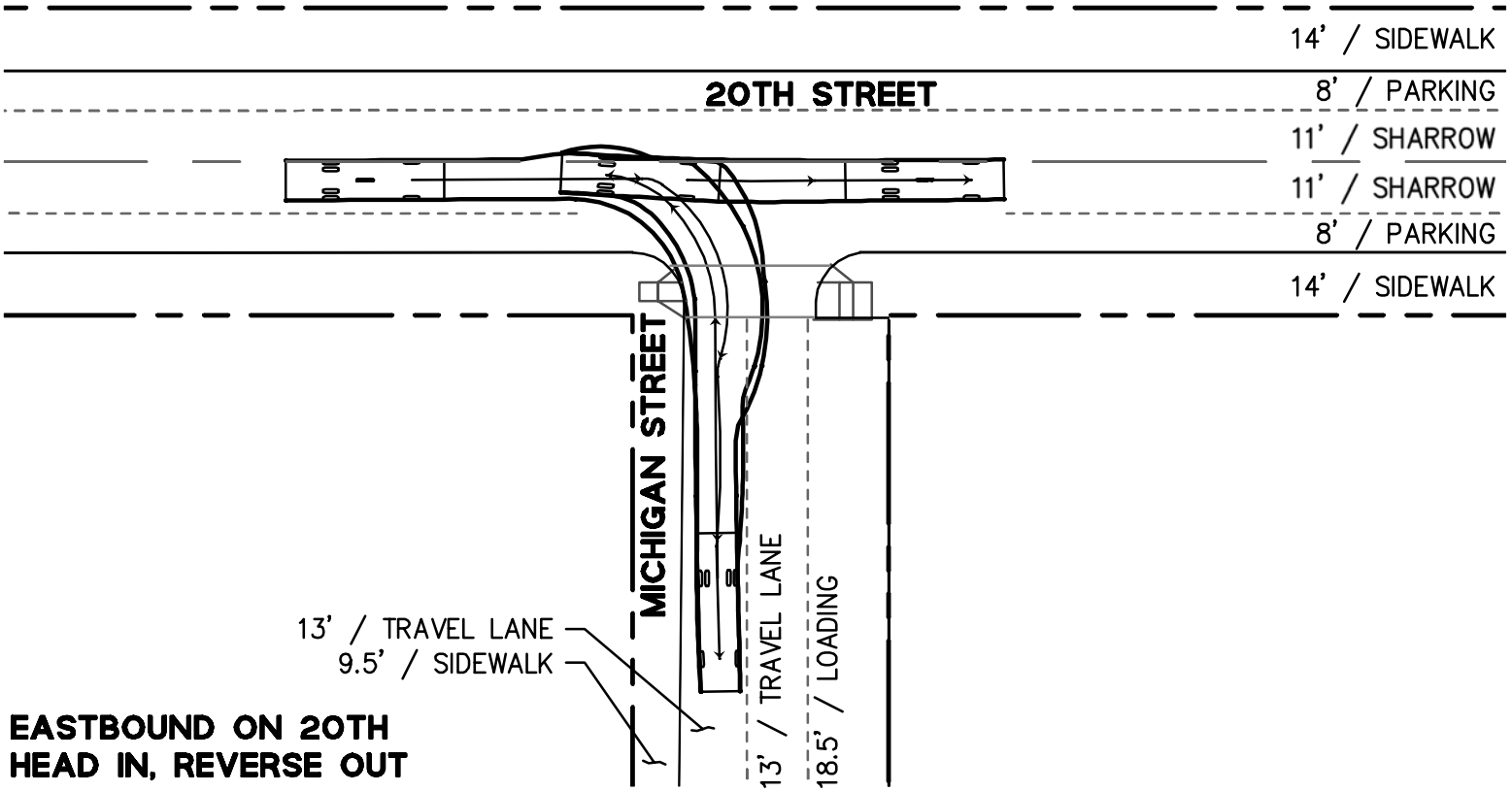
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



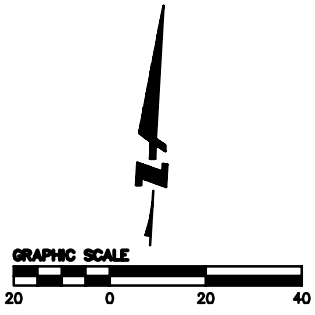
FE–34 Fire Rescue Squad

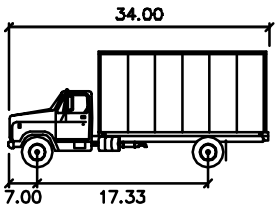
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





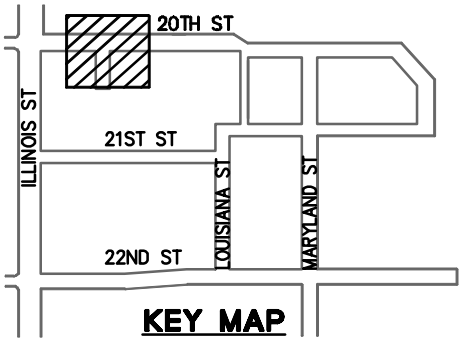
EASTBOUND ON 20TH
HEAD IN, REVERSE OUT

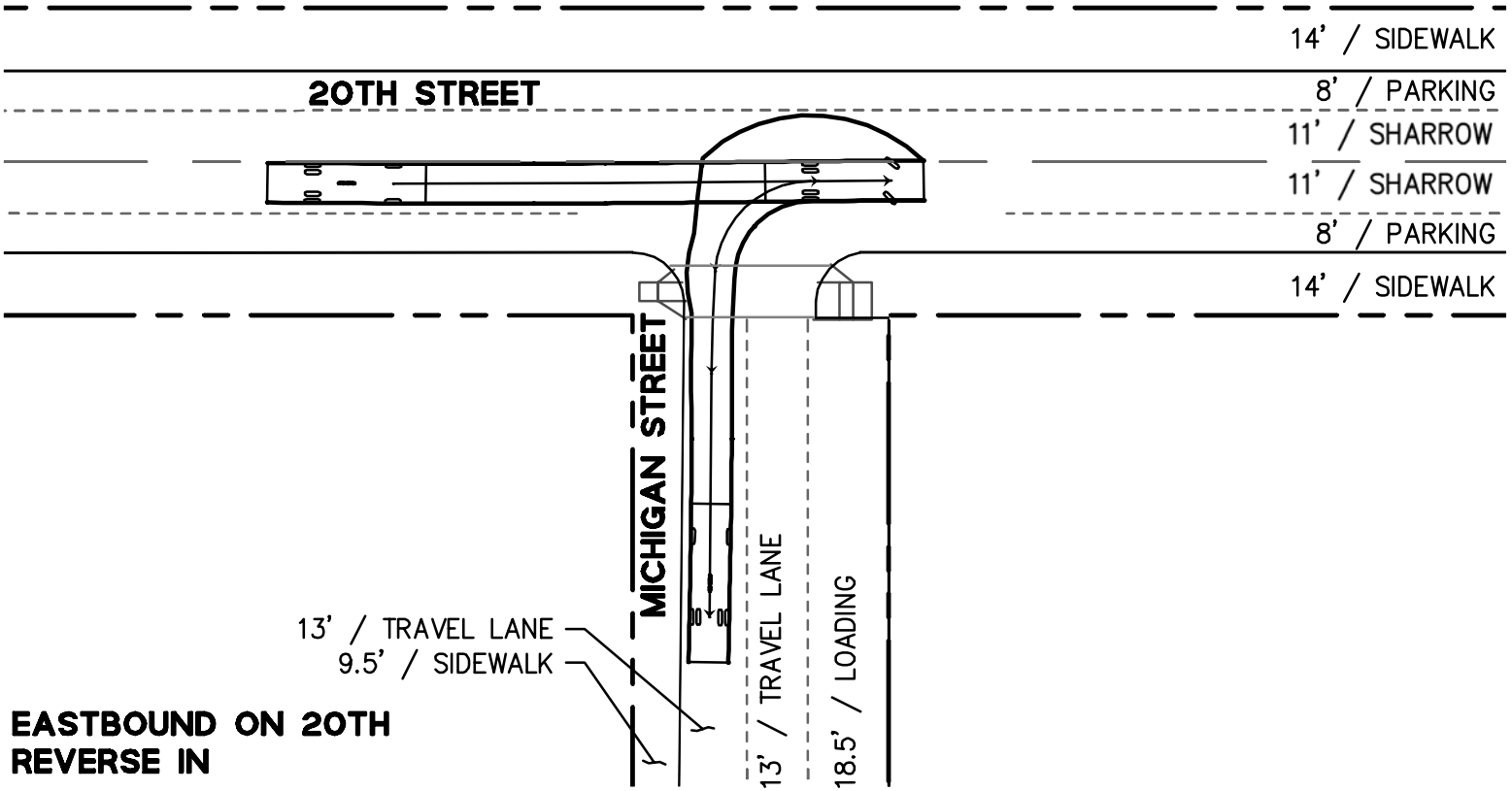




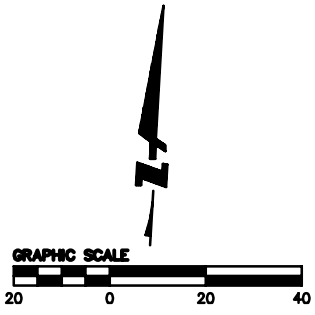
FE–34 Fire Rescue Squad

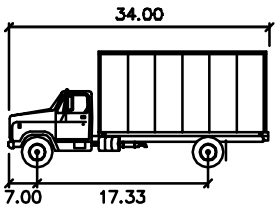
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





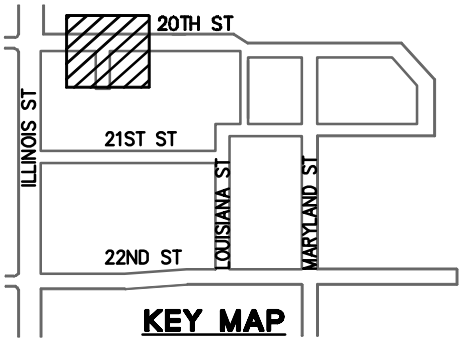
EASTBOUND ON 20TH REVERSE IN

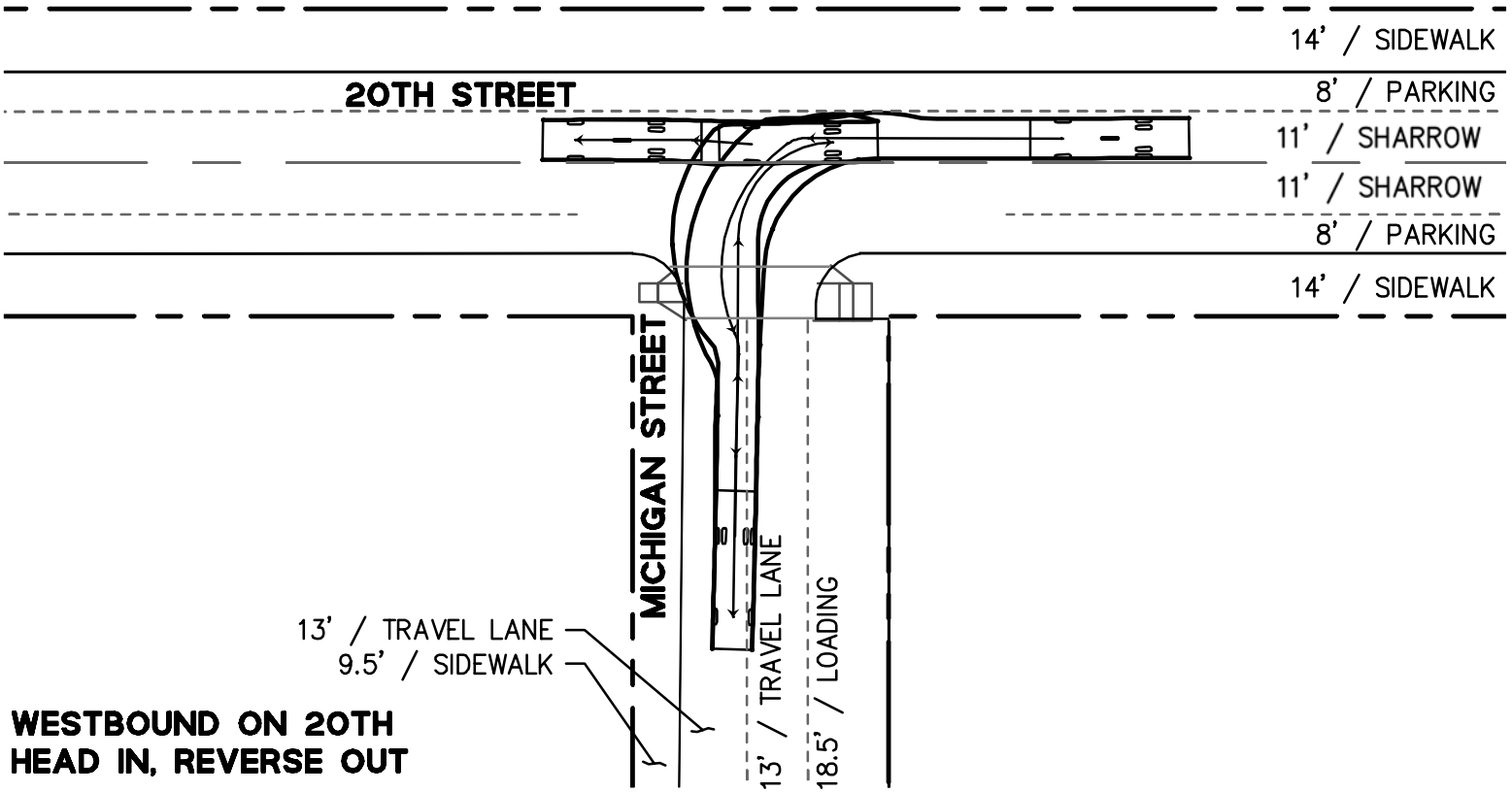


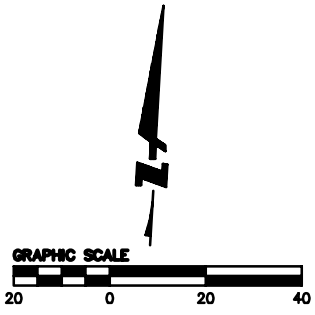


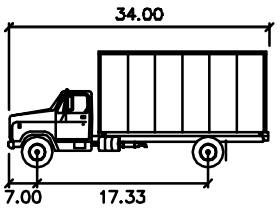
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



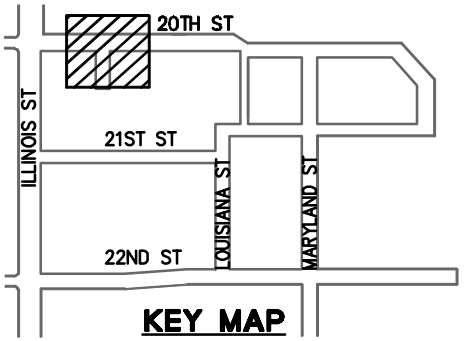


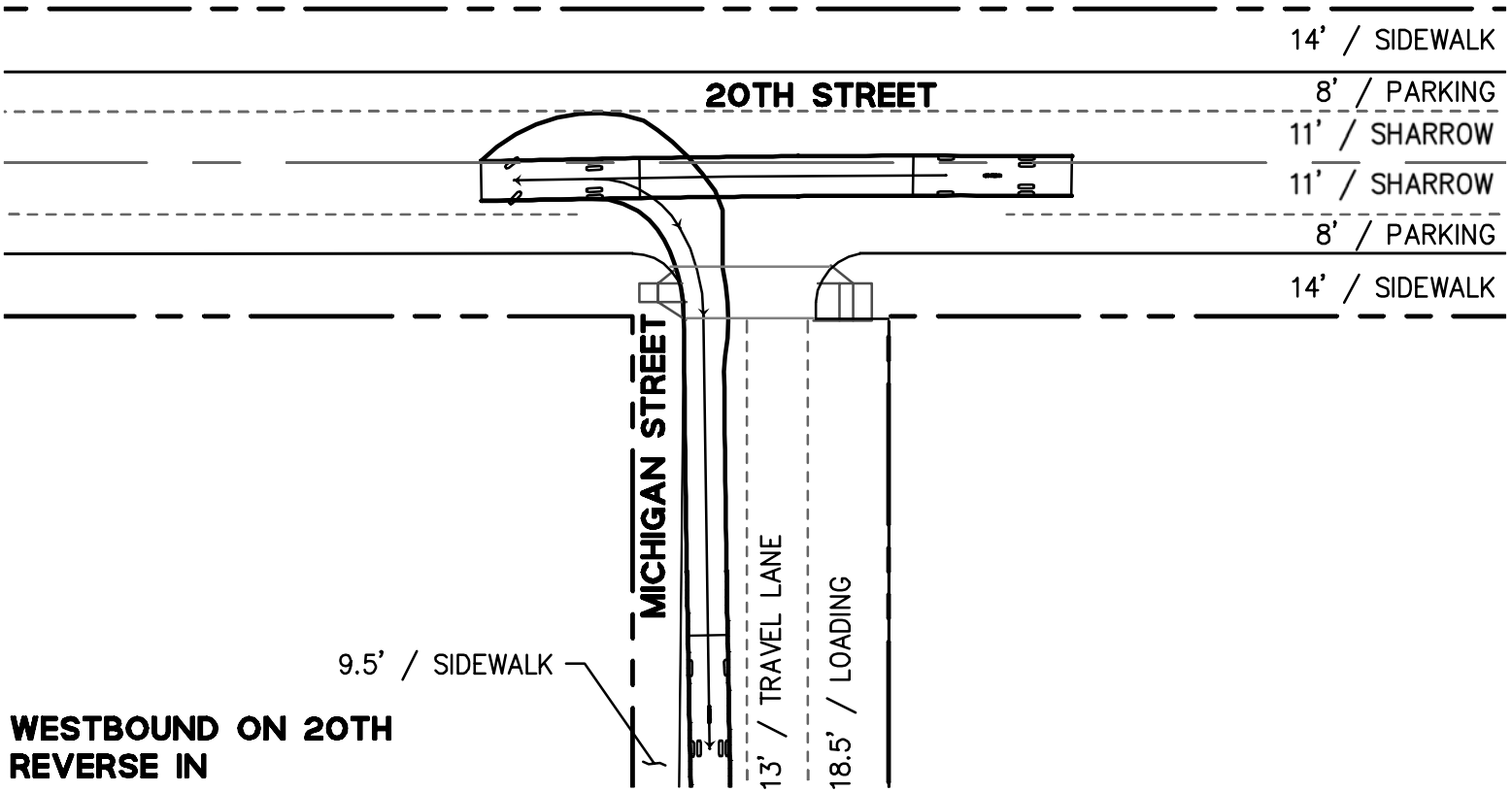




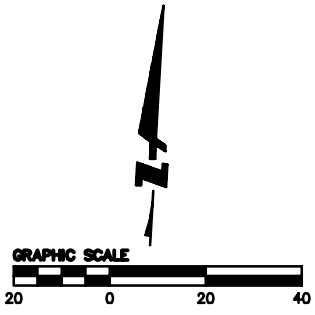
FE–34 Fire Rescue Squad

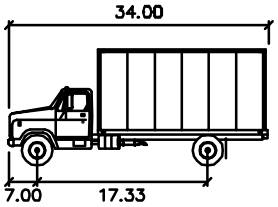
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





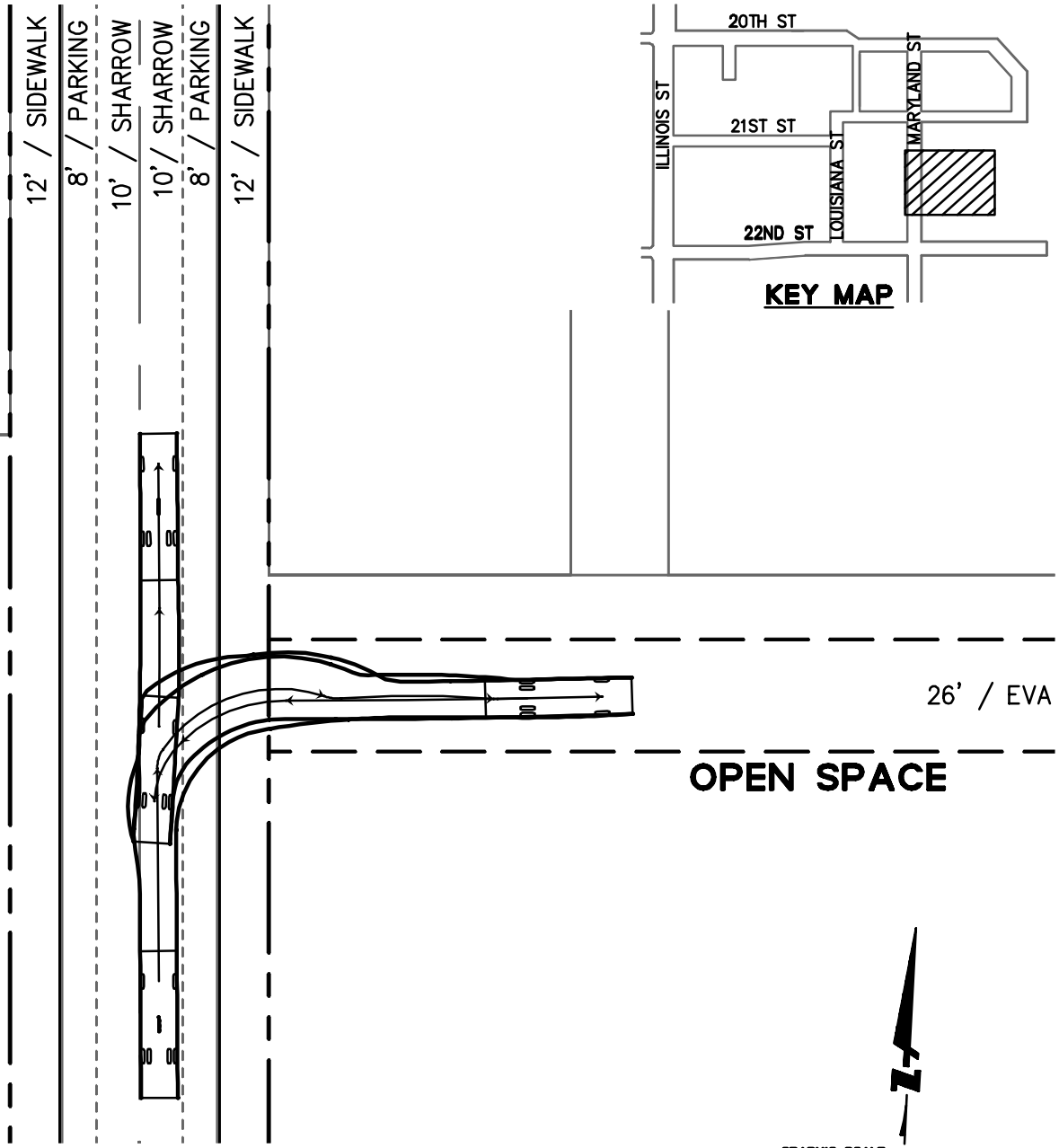
WESTBOUND ON 20TH REVERSE IN



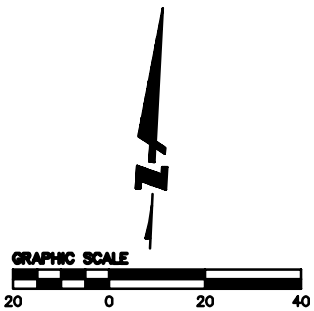


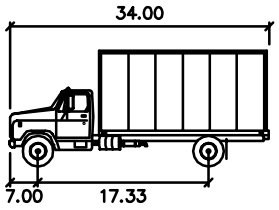
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



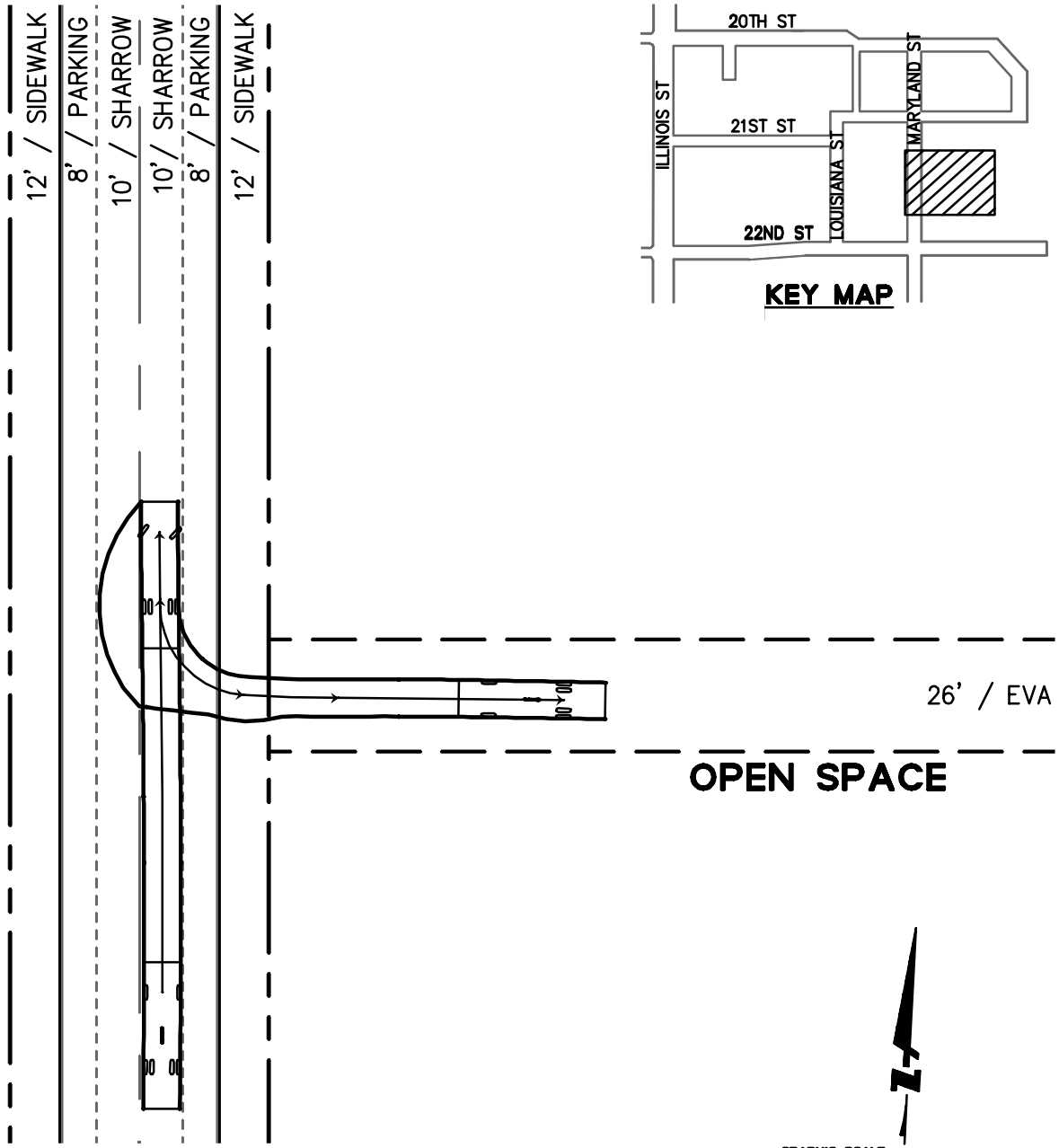
NORTHBOUND ON MARYLAND
RIGHT TURN IN, REVERSE OUT



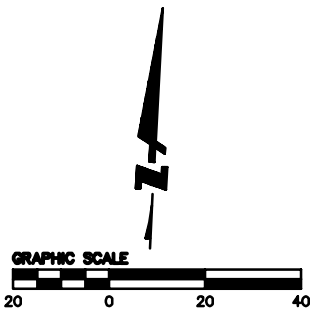


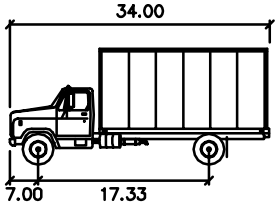
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



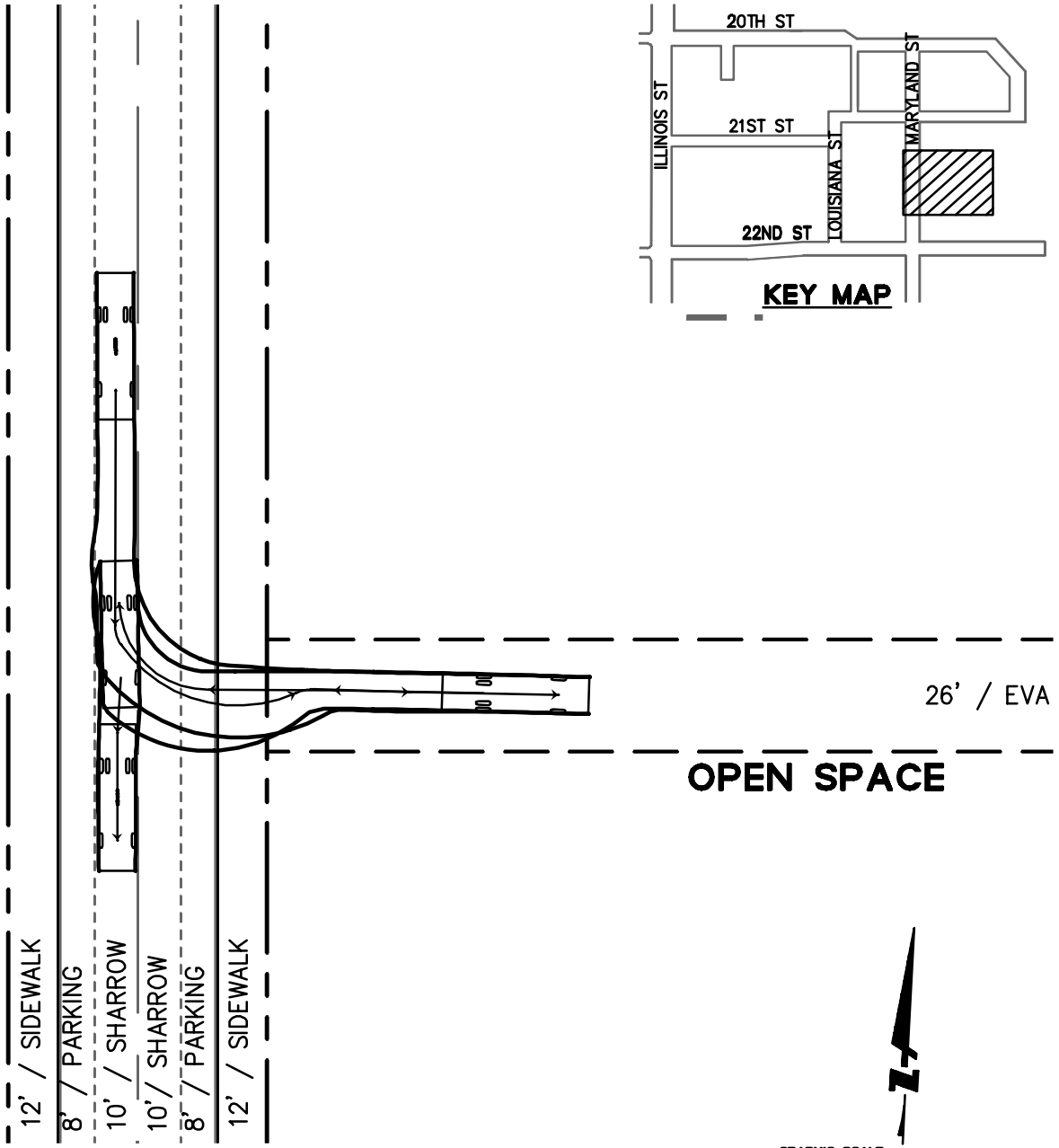
NORTHBOUND ON MARYLAND
REVERSE IN



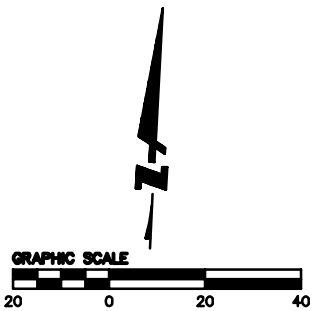


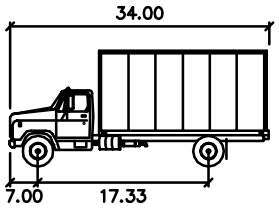
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



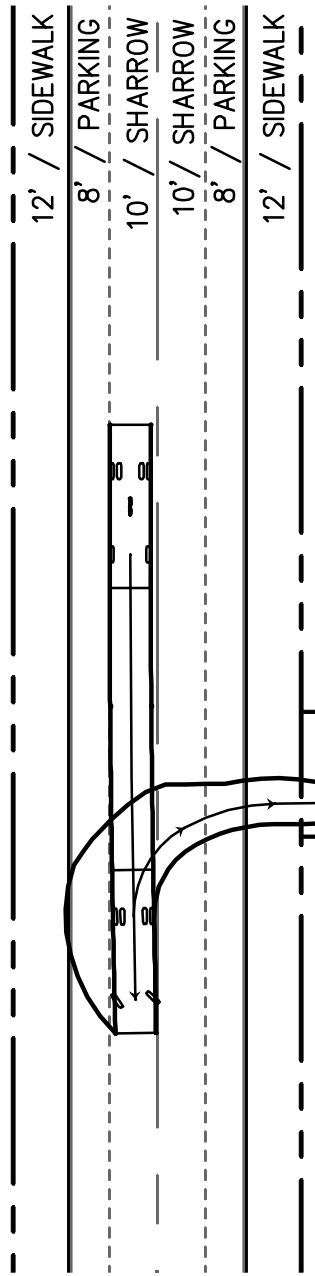
SOUTHBOUND ON MARYLAND
LEFT TURN IN, REVERSE OUT

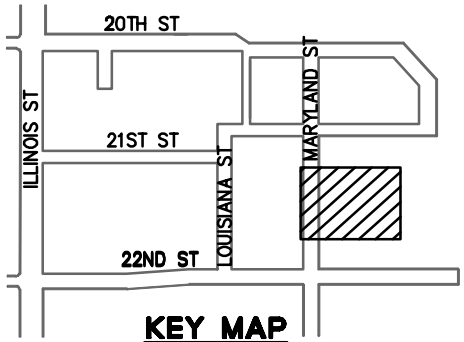




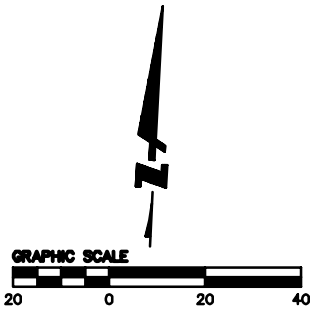
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

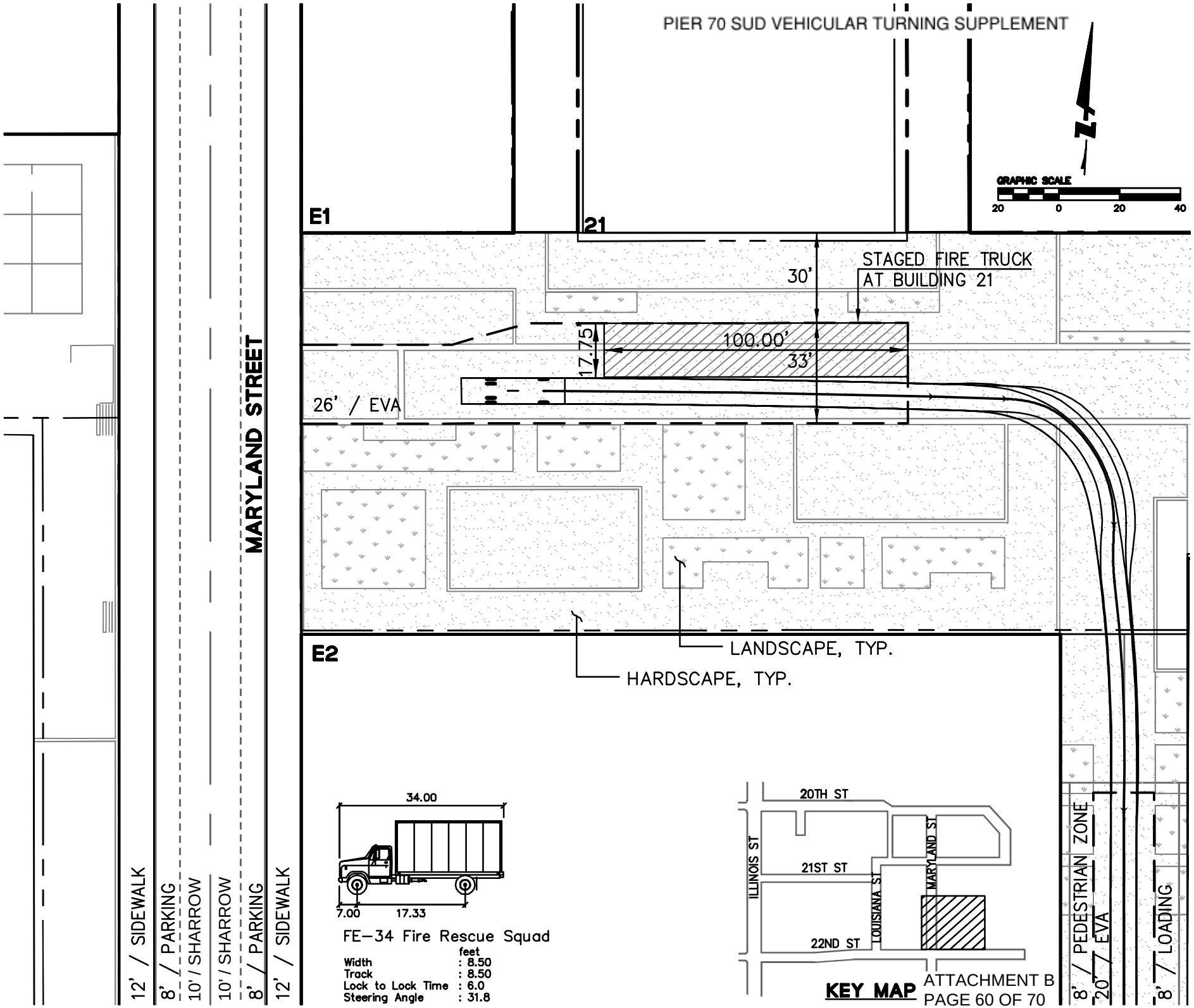




SOUTHBOUND ON MARYLAND
REVERSE IN



PIER 70 SUD VEHICULAR TURNING SUPPLEMENT



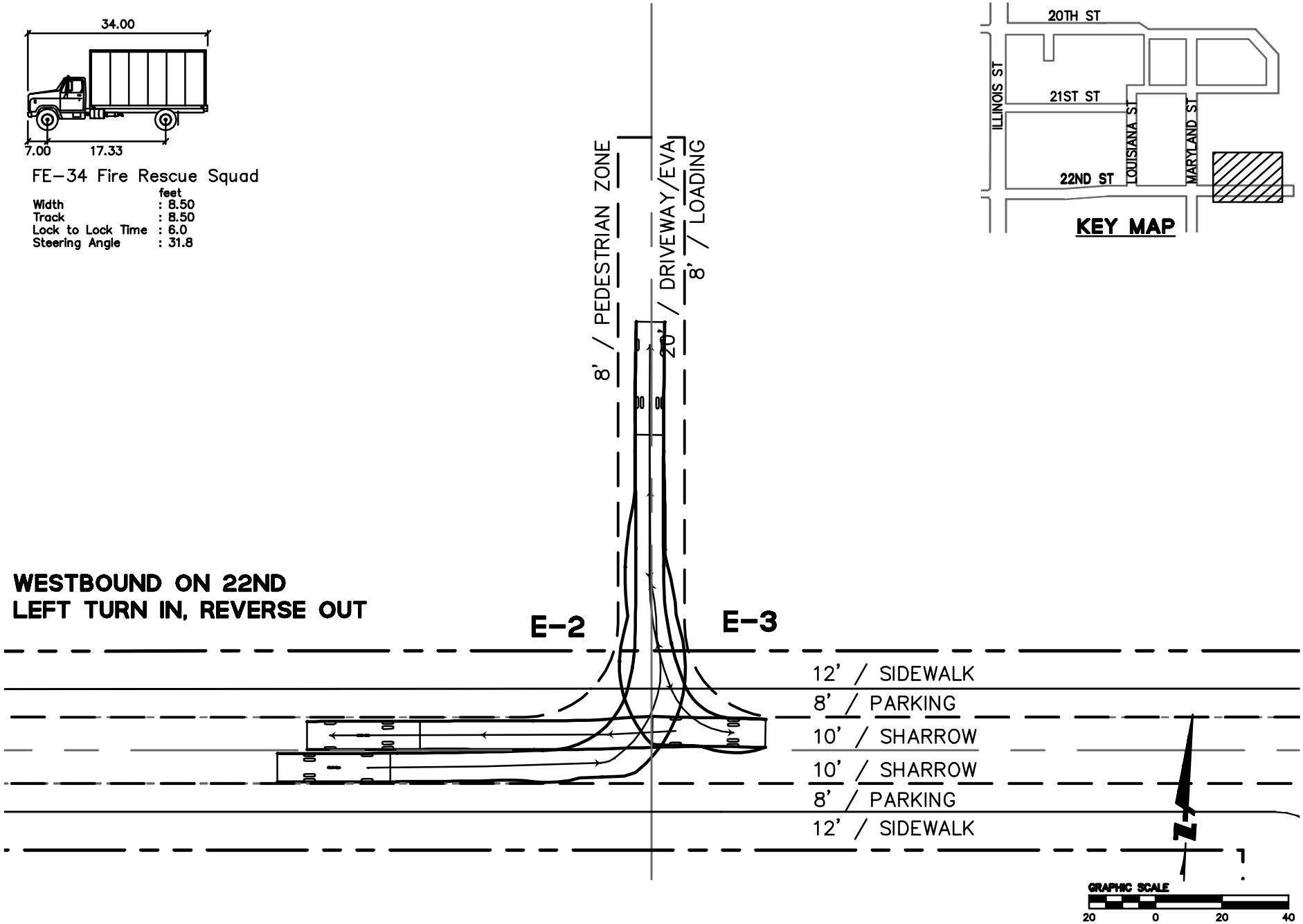
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

KEY MAP

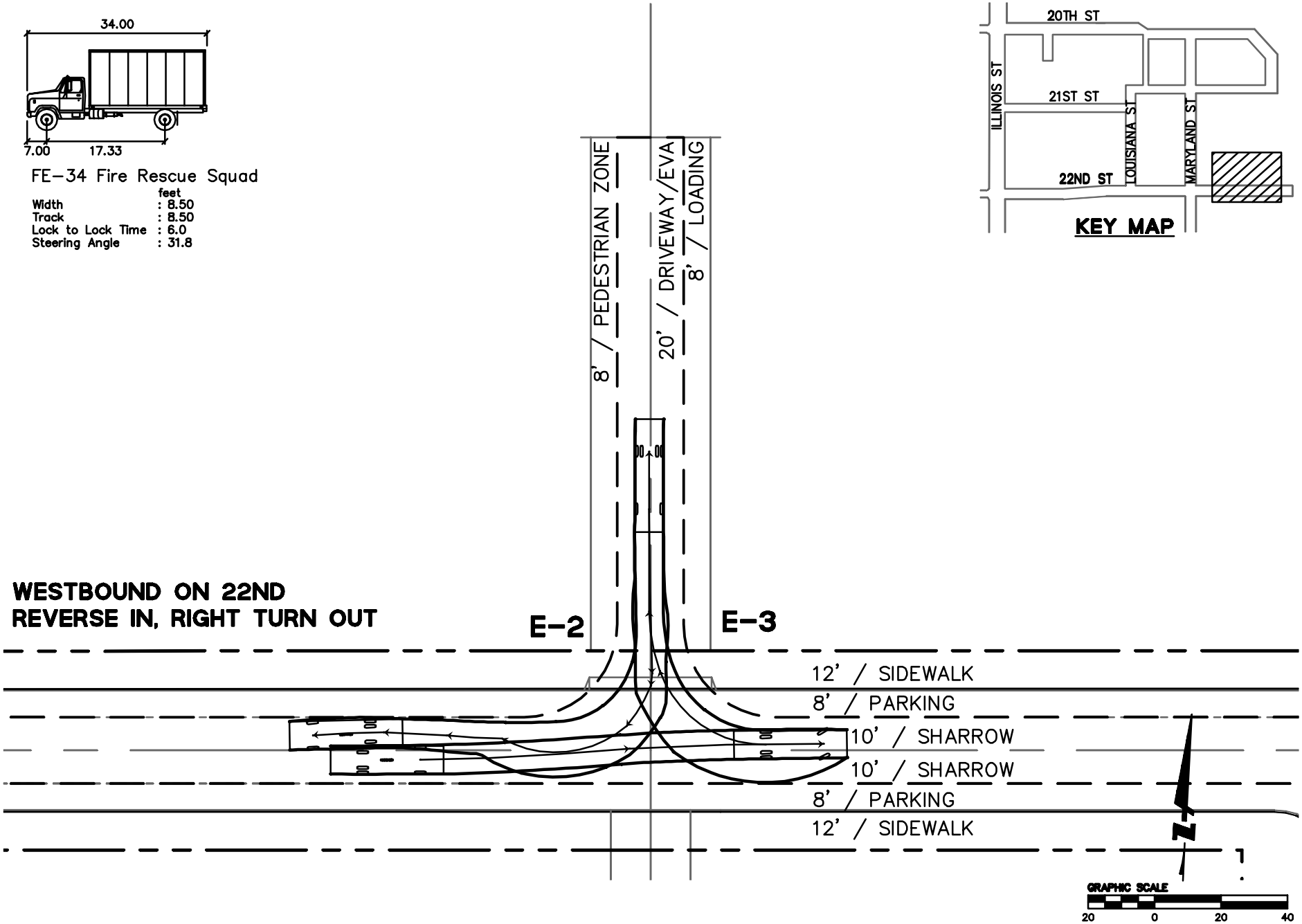
FE–34 Fire Rescue Squad

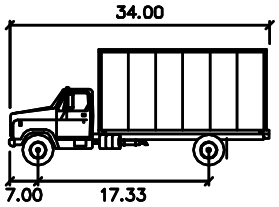
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

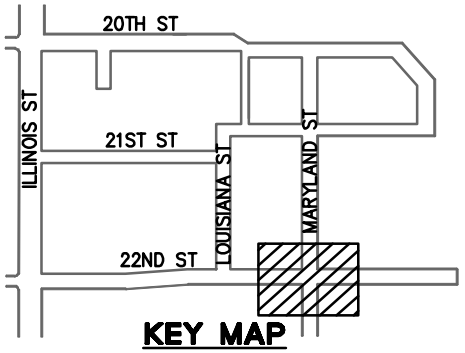
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

12' / SIDEWALK
120.00'
10' / SHARROW
8' / PARKING
12' / SIDEWALK
MARYLAND STREET
FIRE ACCESS ZONE FOR
FOR STAGING FOR E2

GRAPHIC SCALE
20 0 20 40

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK
22ND STREET
12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

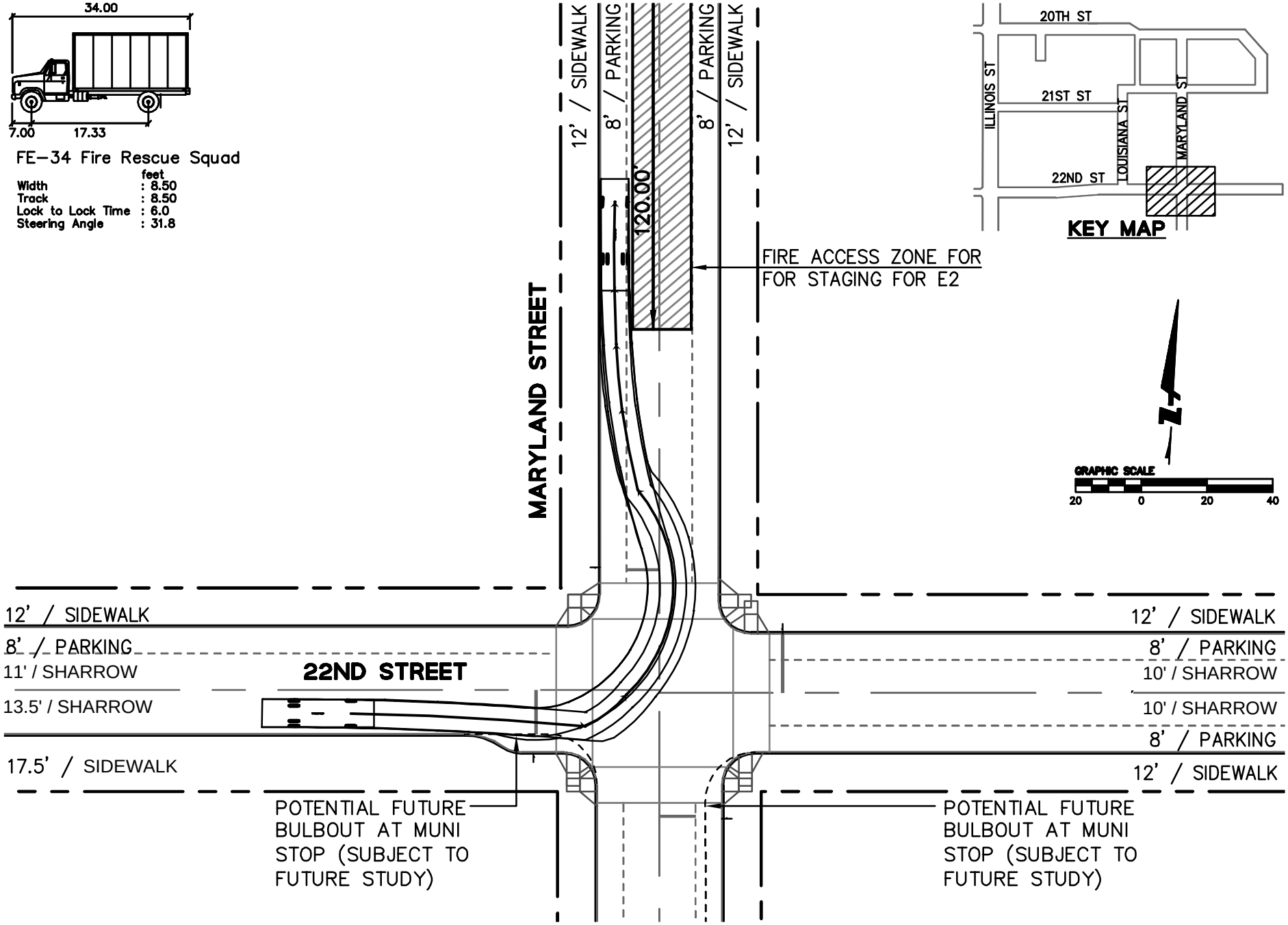
POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

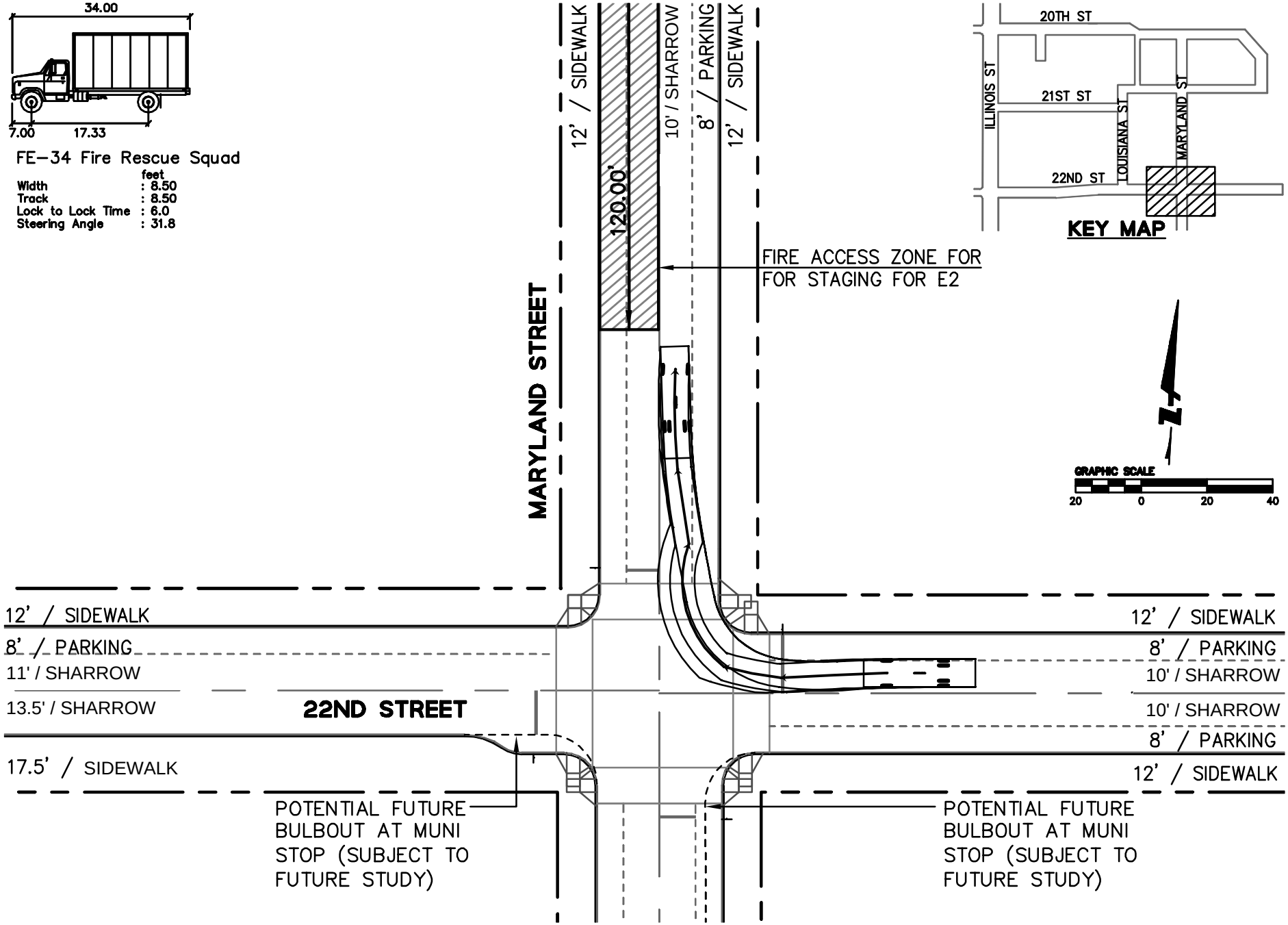
KEY MAP

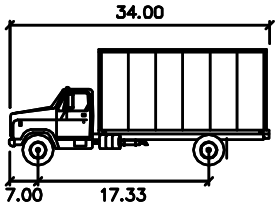


FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

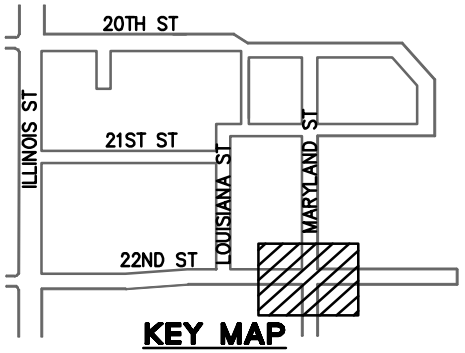
KEY MAP





FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



KEY MAP

12' / SIDEWALK
8' / PARKING
120.00'
8' / PARKING
12' / SIDEWALK

MARYLAND STREET

FIRE ACCESS ZONE FOR
FOR STAGING FOR E2

GRAPHIC SCALE
20 0 20 40

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK

22ND STREET

12' / SIDEWALK
8' / PARKING
10' / SHARROW
10' / SHARROW
8' / PARKING
12' / SIDEWALK

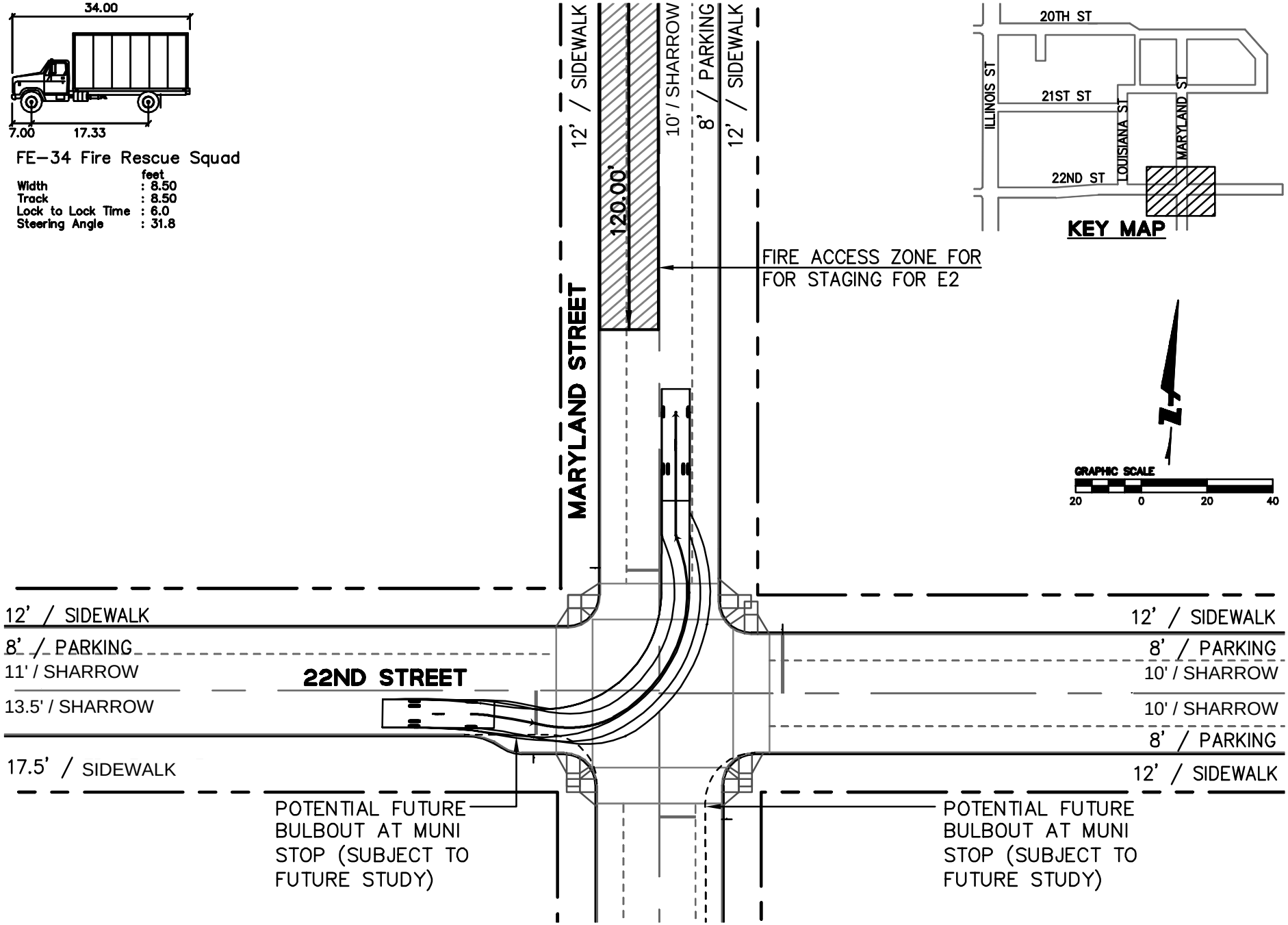
POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

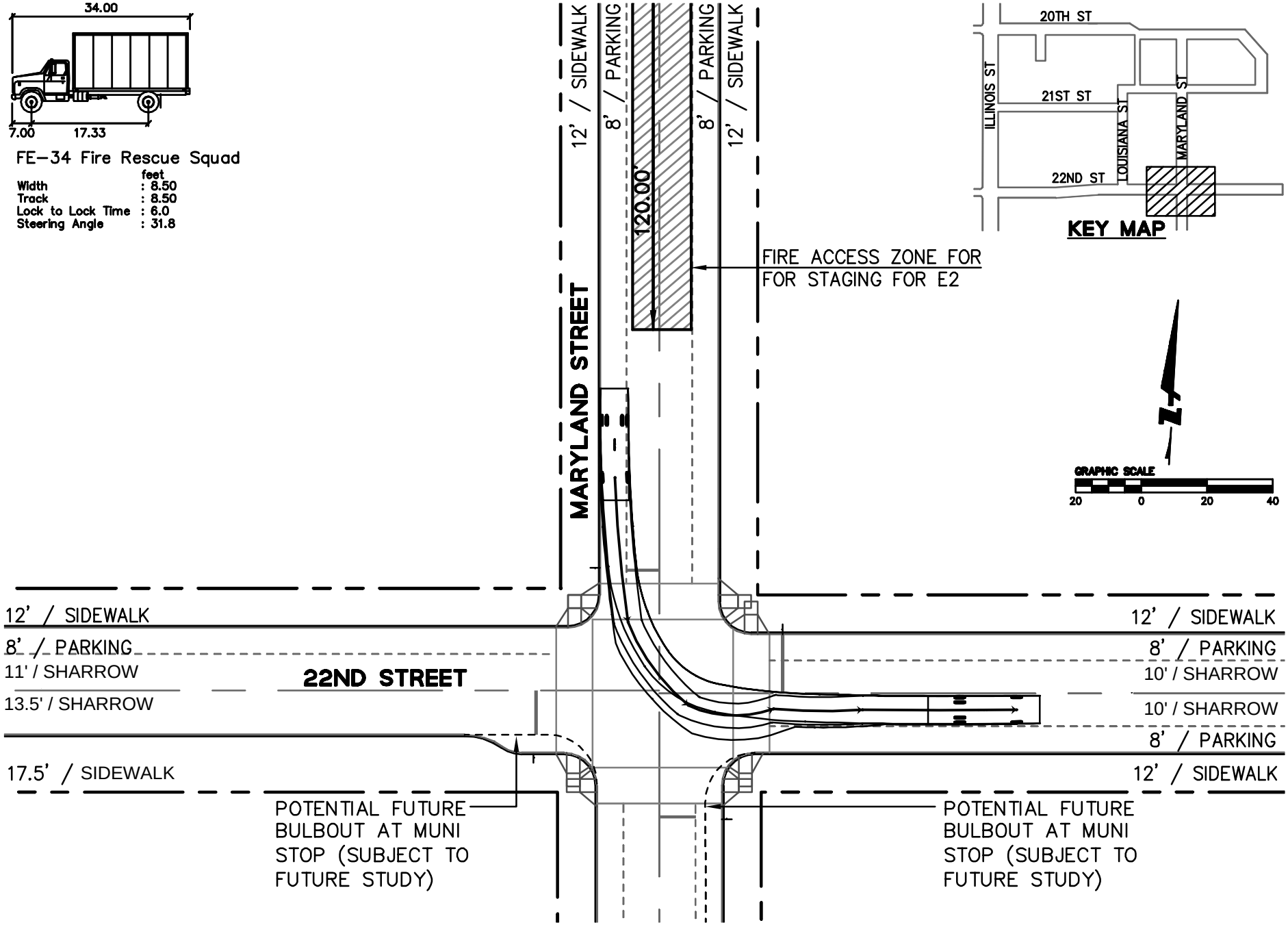
KEY MAP



FE–34 Fire Rescue Squad

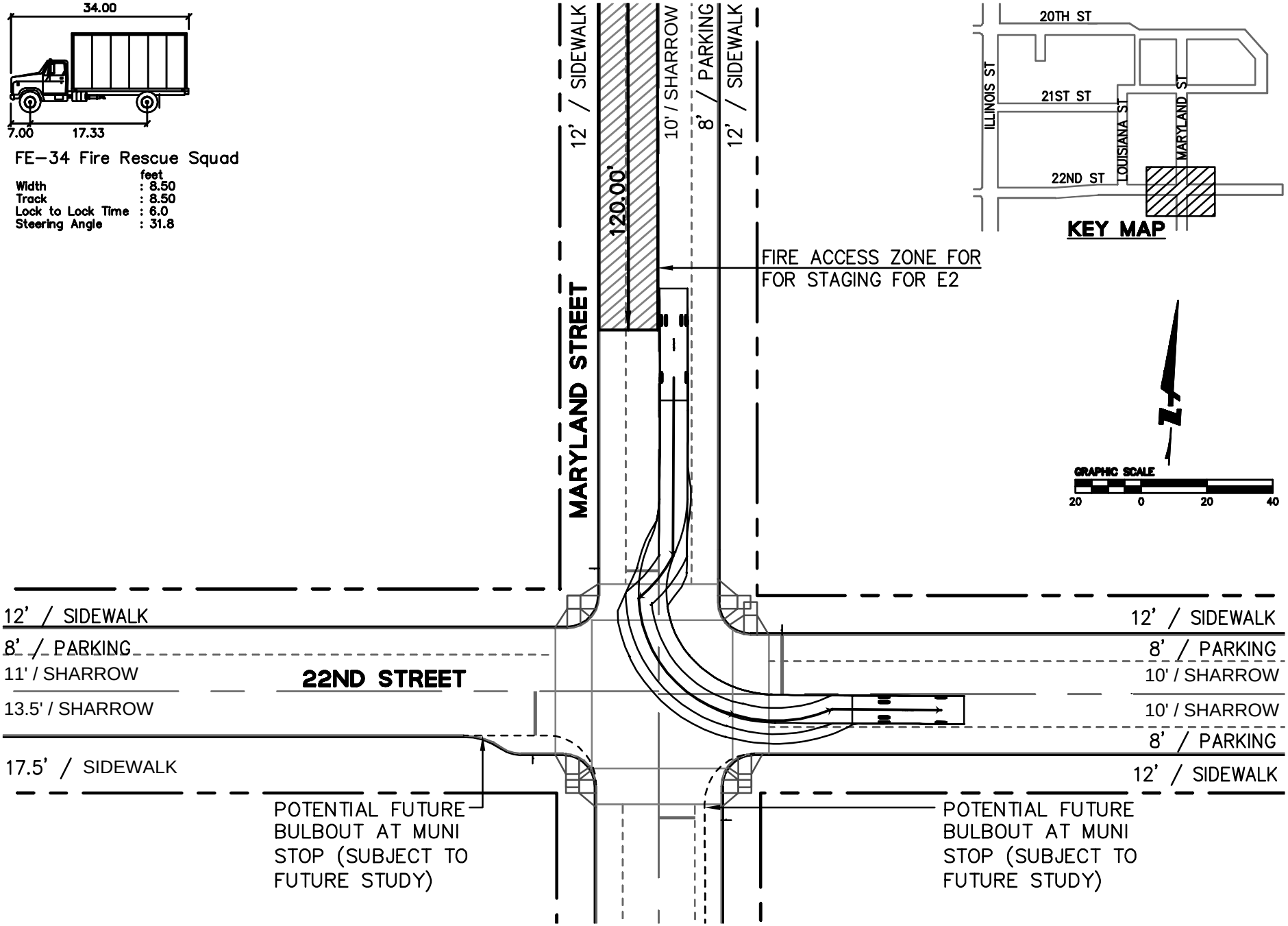
	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

KEY MAP



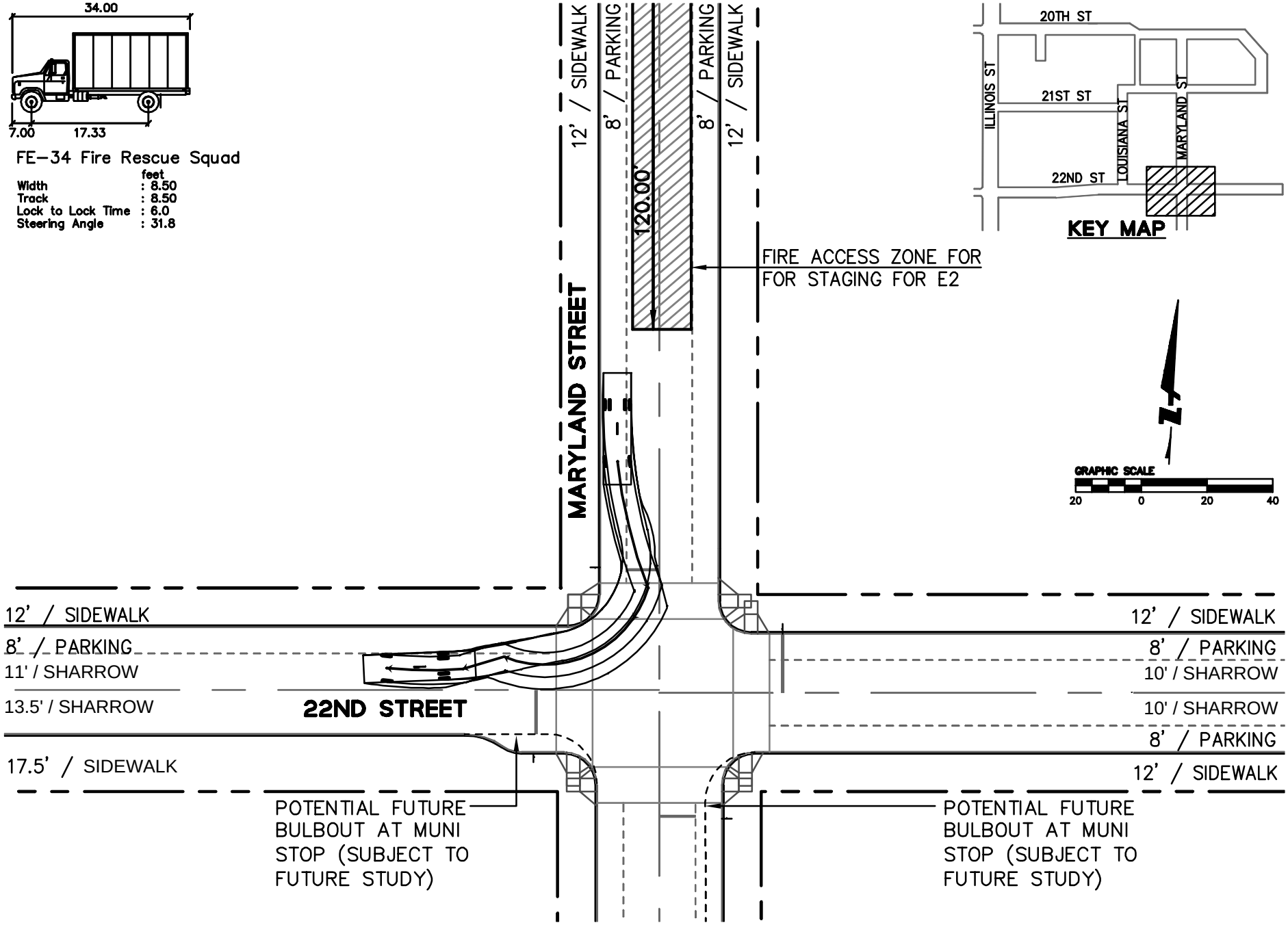
FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8



FE–34 Fire Rescue Squad

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 31.8

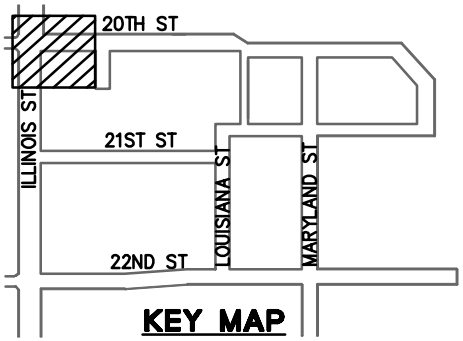


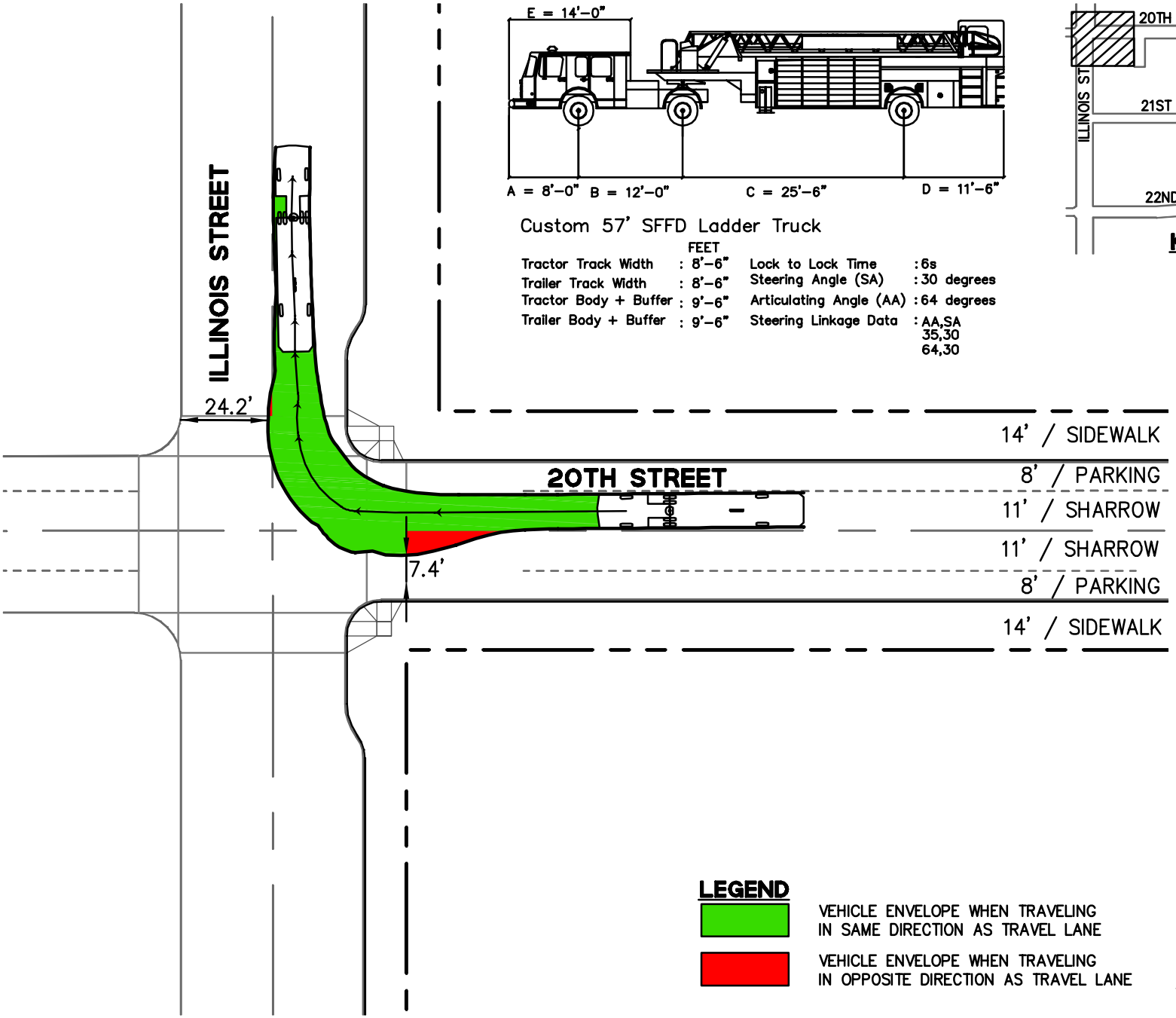
ATTACHMENT C

SFFD 57’ Ladder Truck Turning Studies

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

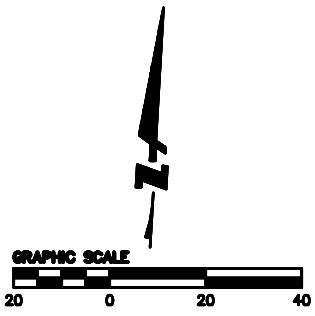




LEGEND

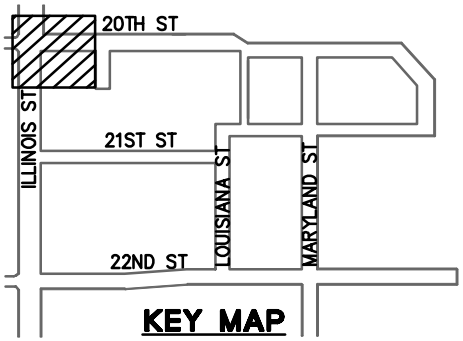
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

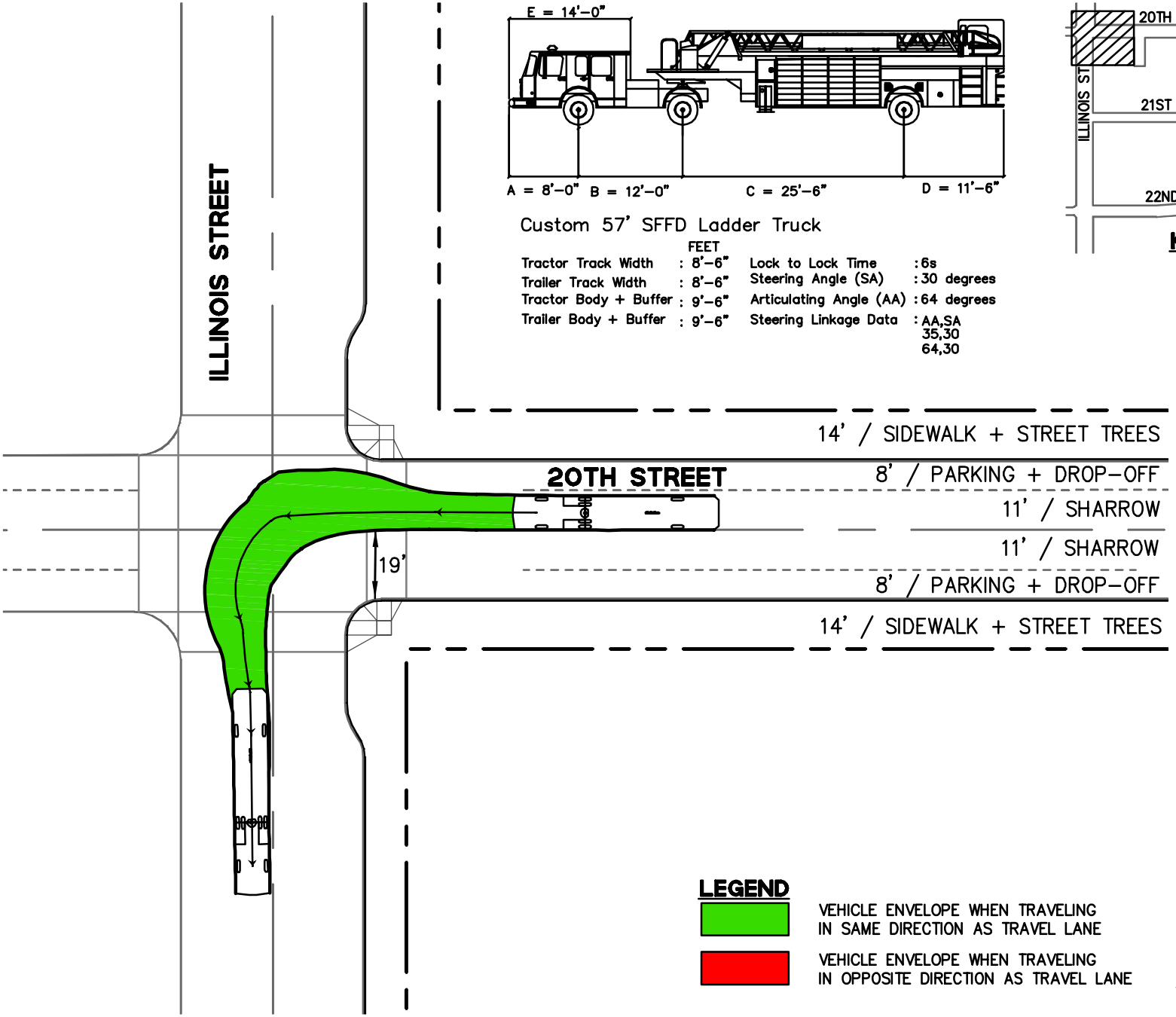
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'–6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'–6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'–6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'–6"	Steering Linkage Data	: AA,SA 35,30 64,30

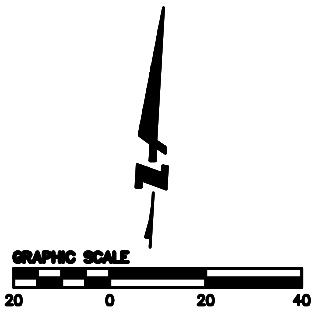




LEGEND

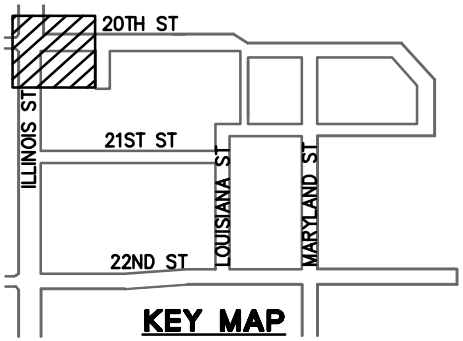
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

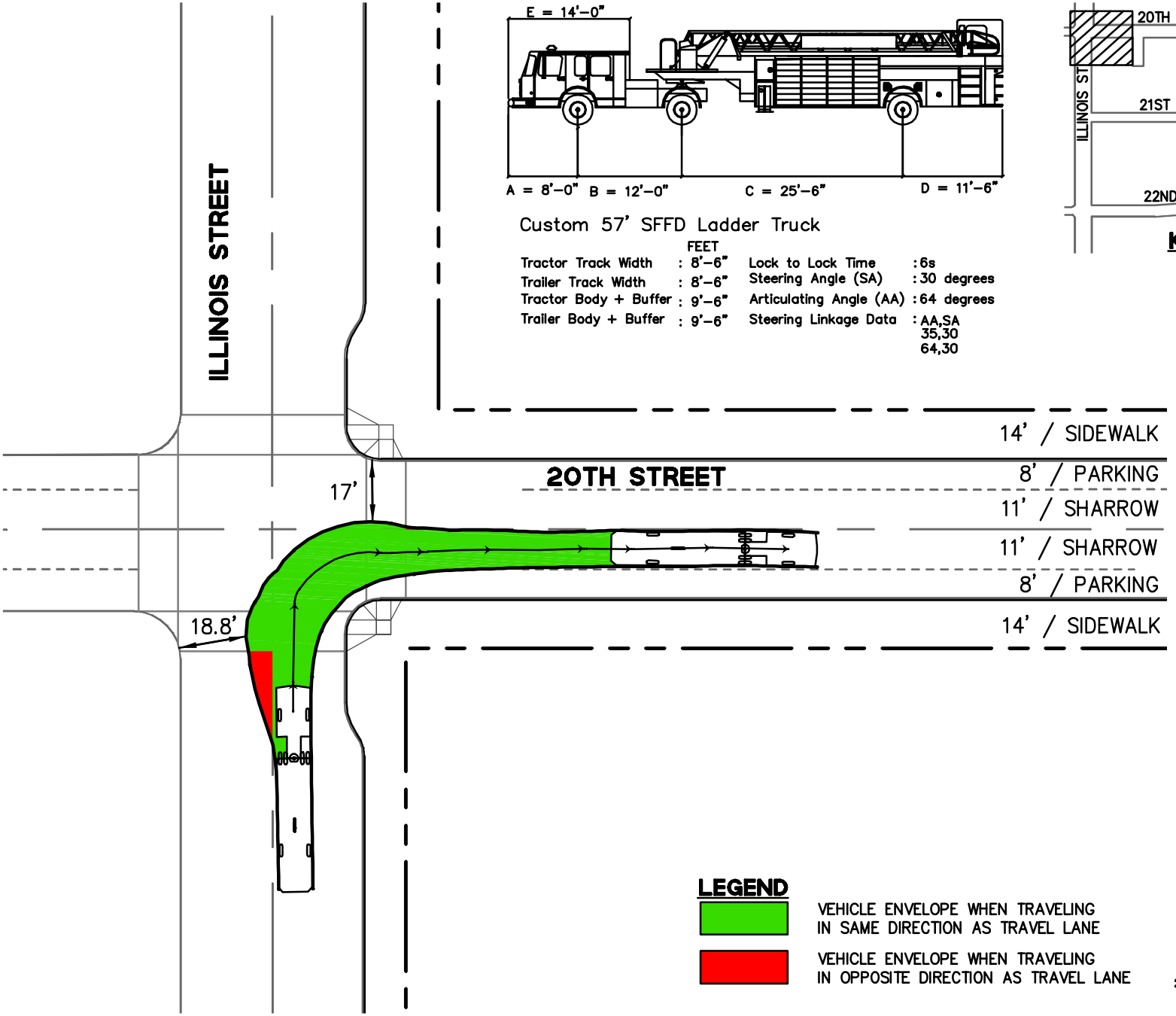
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

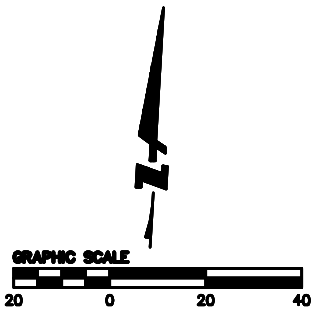




LEGEND

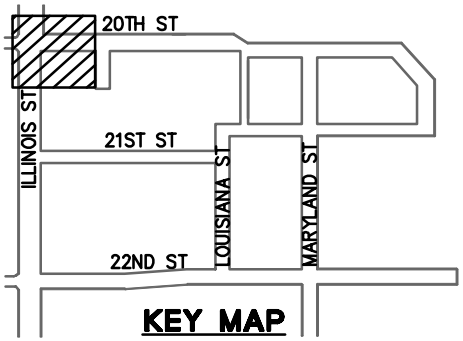
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

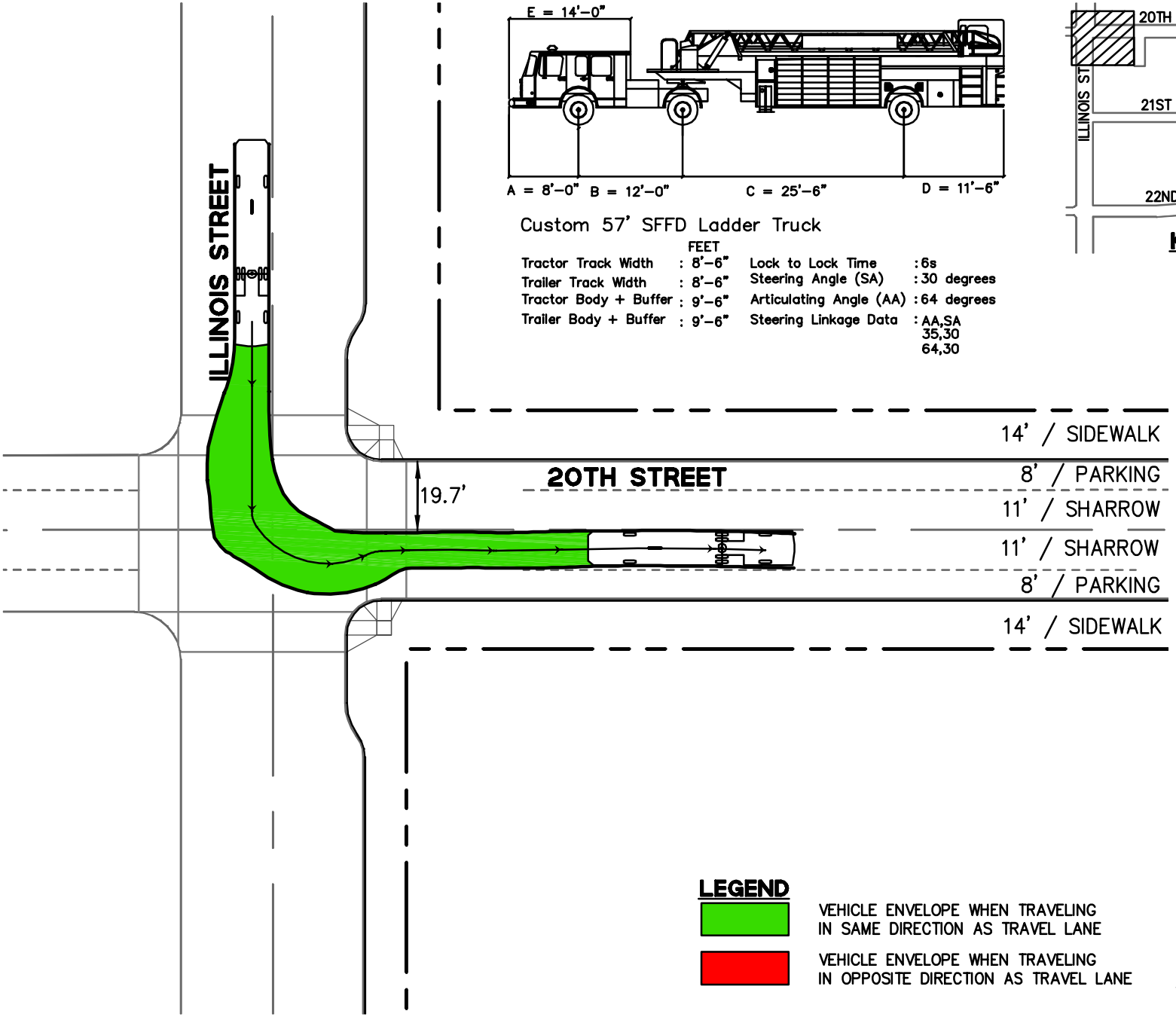
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'–6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'–6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'–6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'–6"	Steering Linkage Data	: AA,SA 35,30 64,30

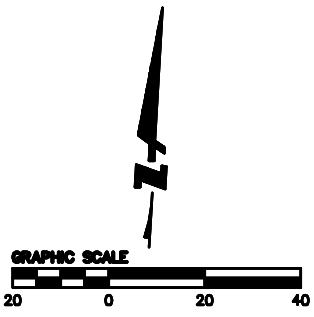


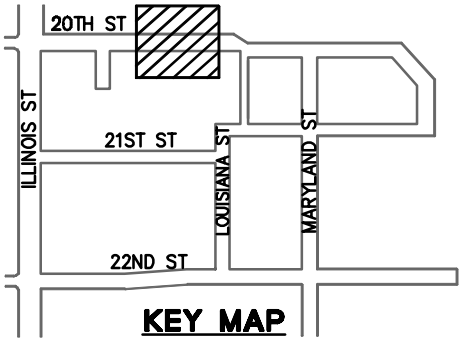


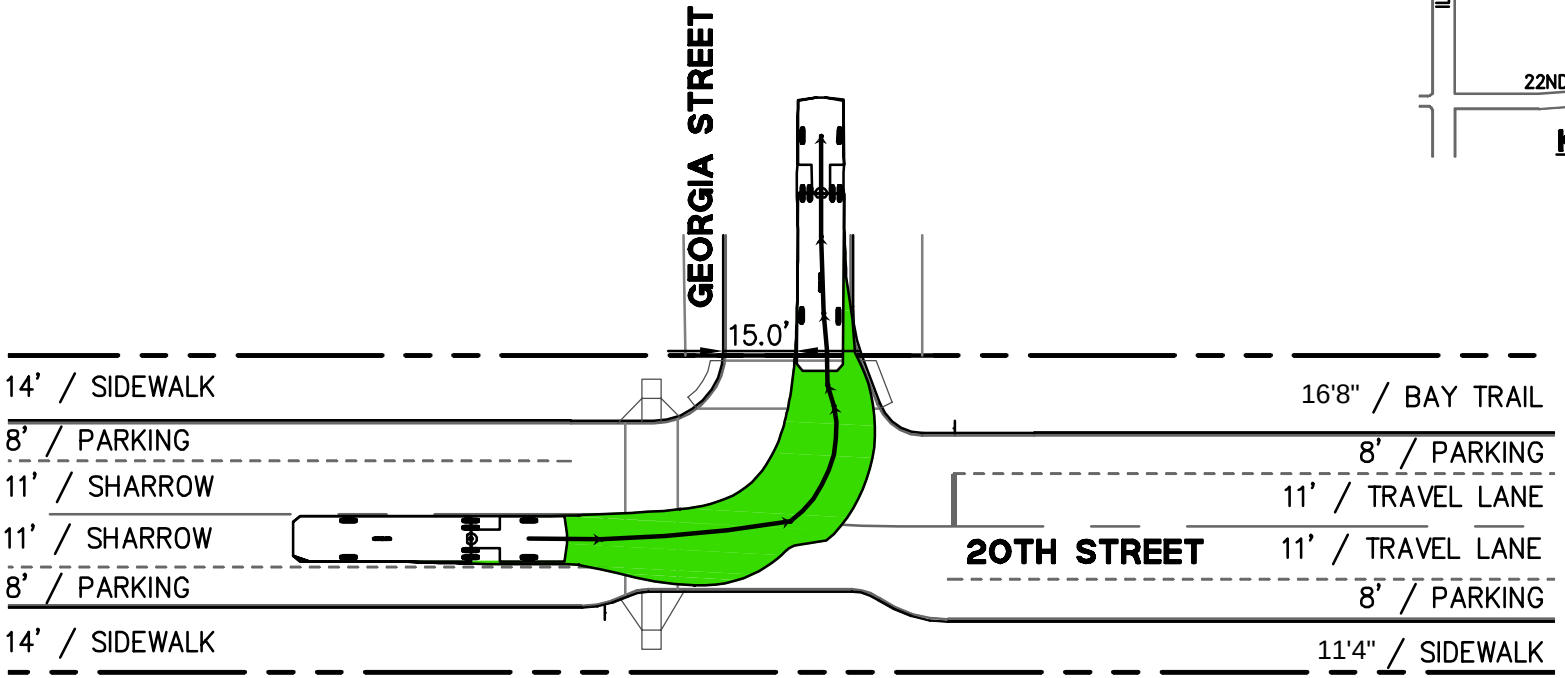
LEGEND

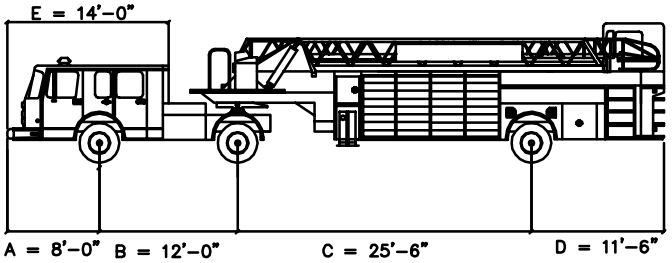
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE









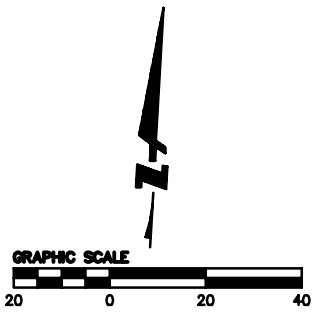
Custom 57' SFFD Ladder Truck

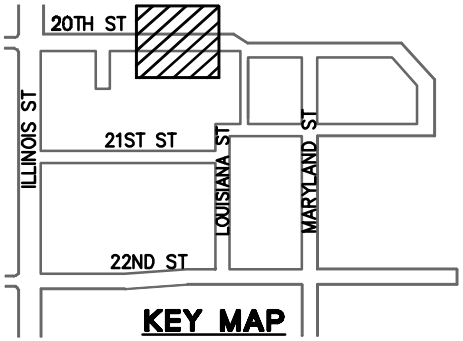
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

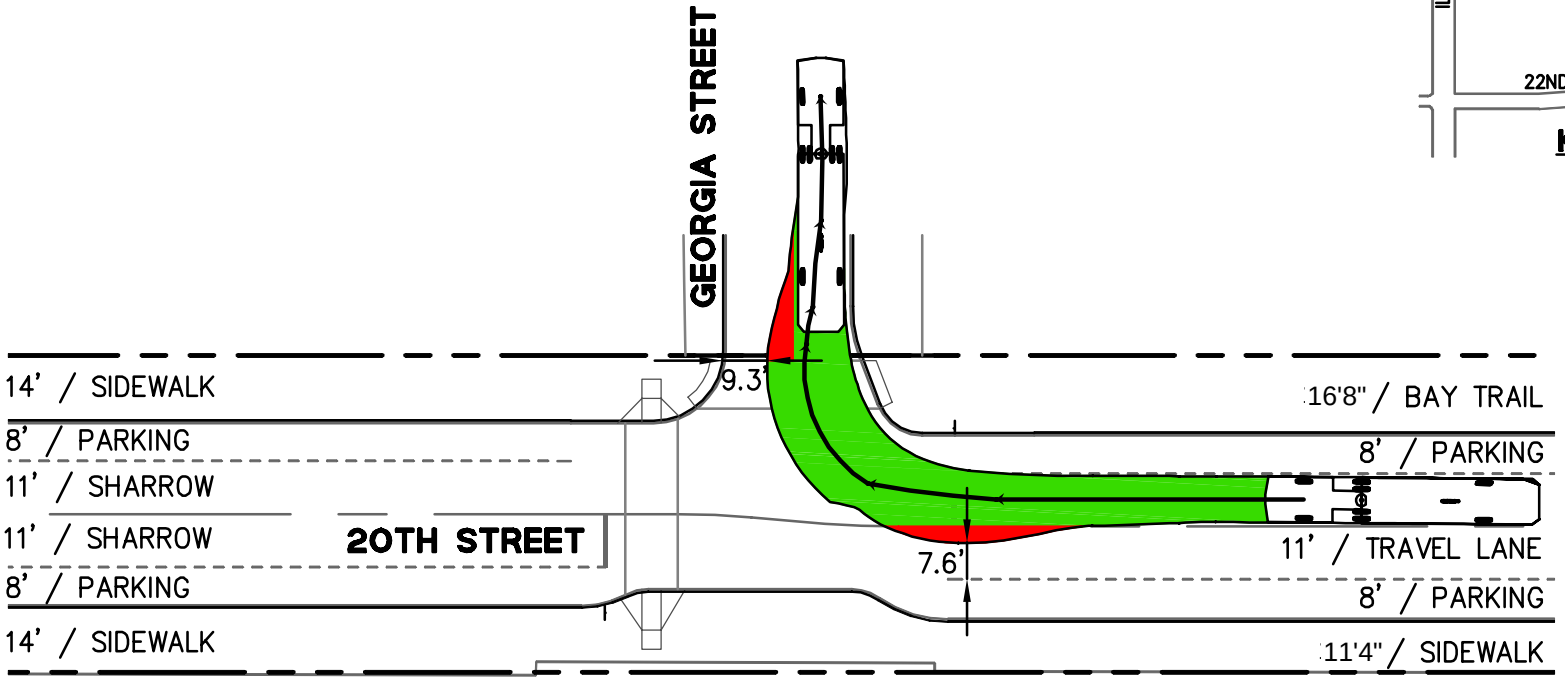
LEGEND

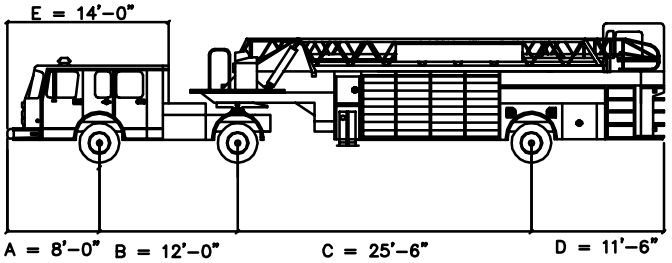
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE









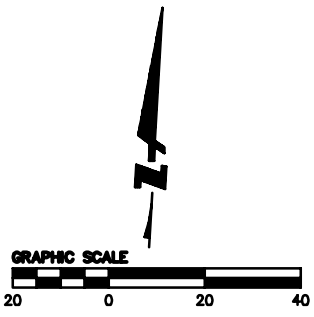
Custom 57' SFFD Ladder Truck

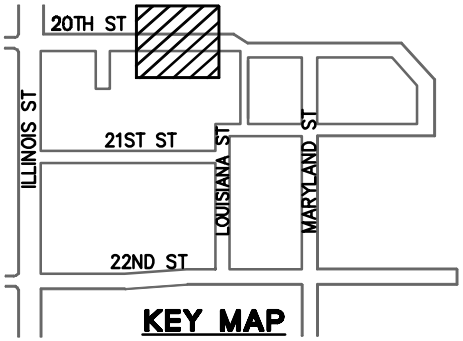
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

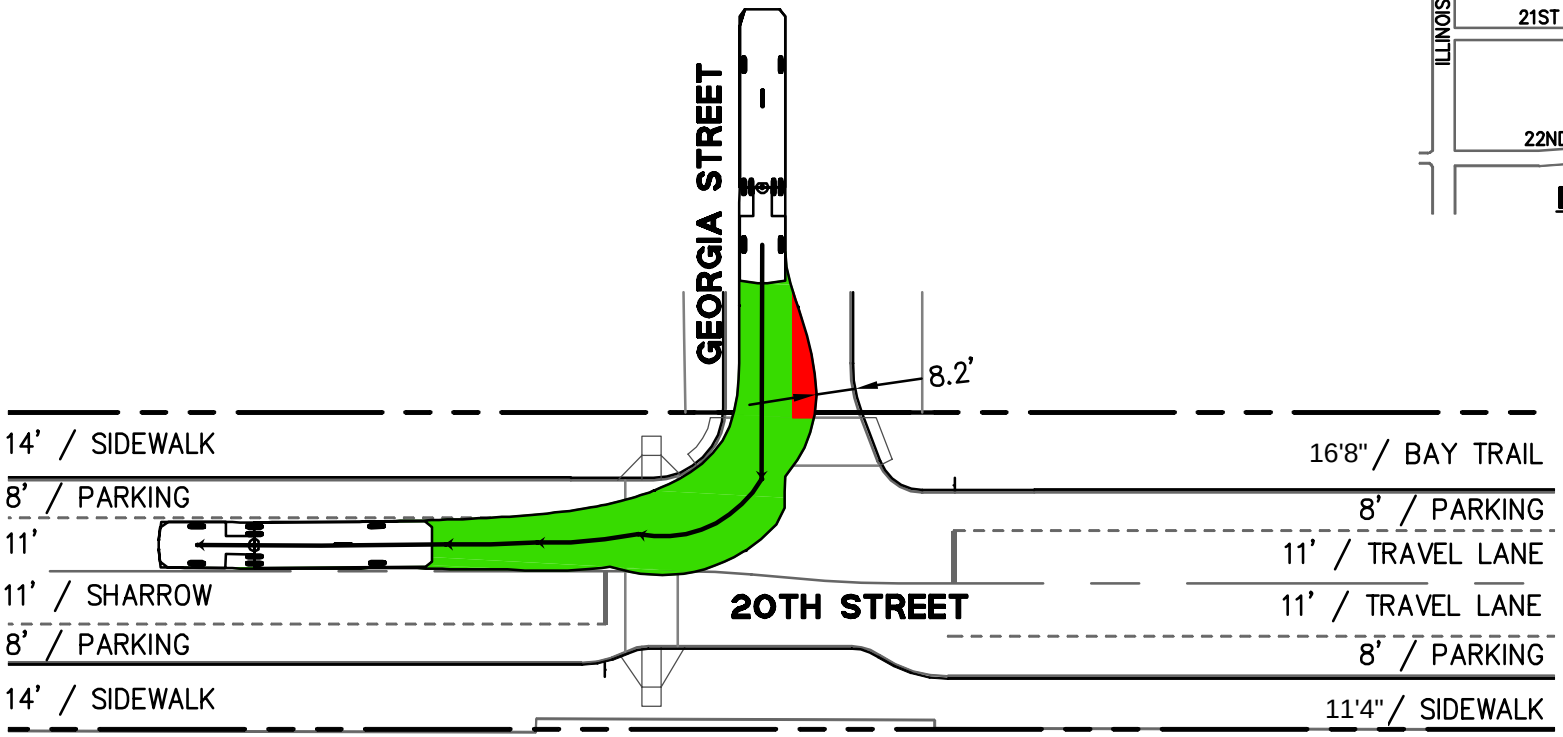
LEGEND

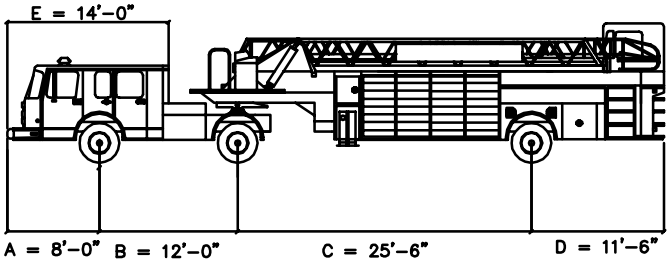
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE









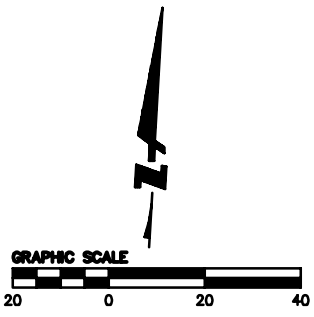
Custom 57' SFFD Ladder Truck

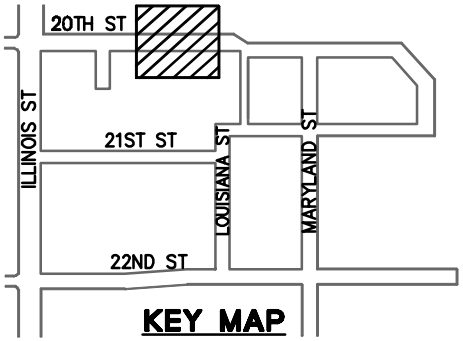
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

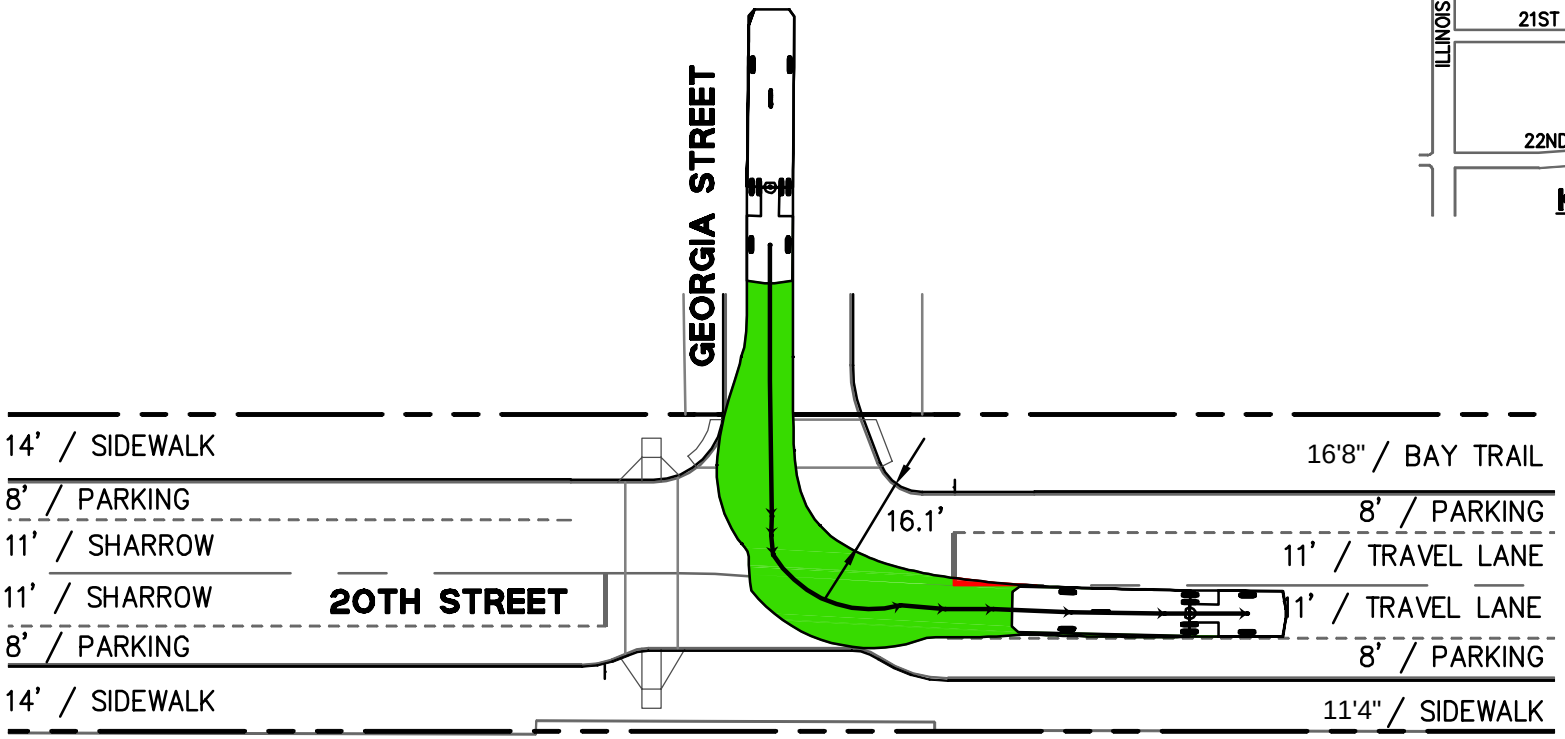
LEGEND

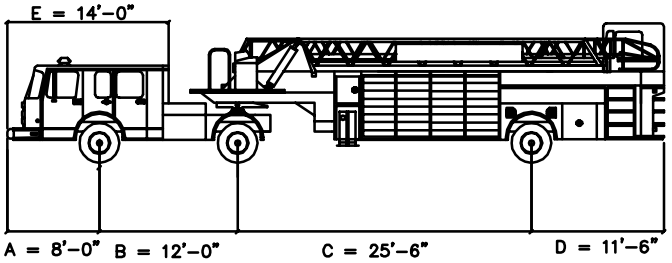
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE









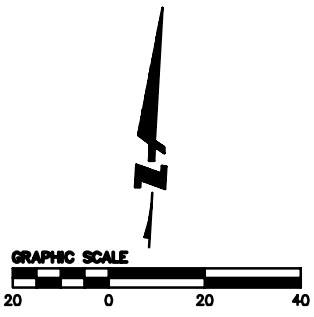
Custom 57' SFFD Ladder Truck

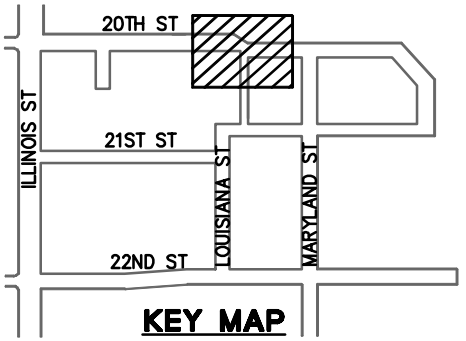
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE





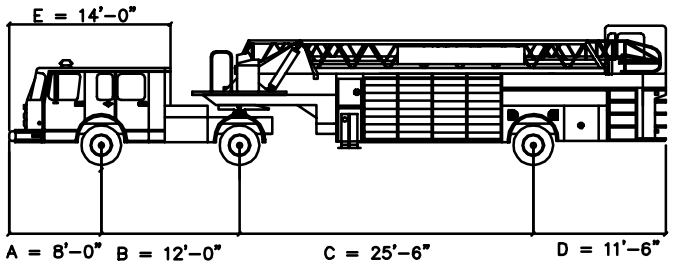
16.67' / BAY TRAIL
8' / PARKING
11' / TRAVEL LANE
11'
8' / PARKING
11.33' / SIDEWALK

20TH STREET

7.0'

STOP

16' / BAY TRAIL
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK



Custom 57' SFFD Ladder Truck

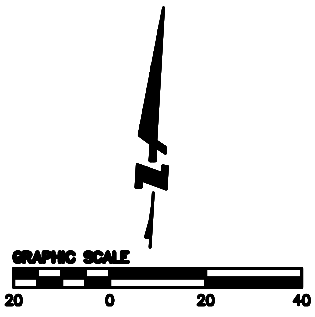
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

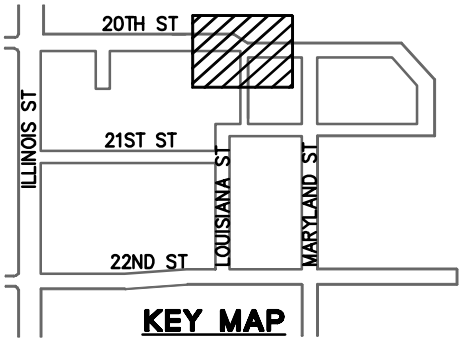
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

12' / LOADING BAY
20' / TRAVEL WAY
10' / SIDEWALK
LOUISIANA STREET





16.67' / BAY TRAIL
8' / PARKING
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
11.33' / SIDEWALK

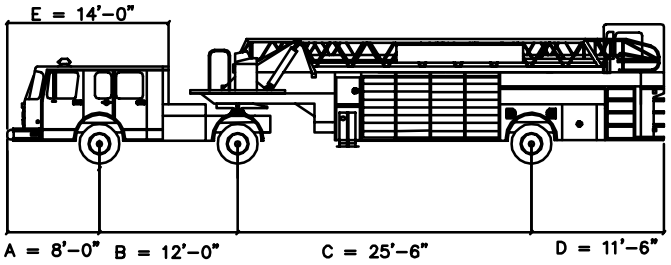
20TH STREET

16' / BAY TRAIL
11'
10' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK

7.0'

LOUISIANA STREET

12' / LOADING BAY
20' / TRAVEL WAY
10' / SIDEWALK



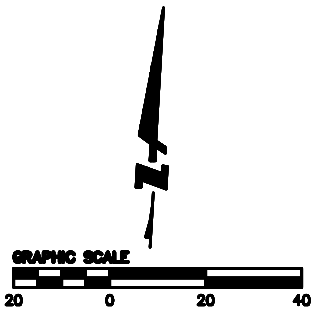
Custom 57' SFFD Ladder Truck

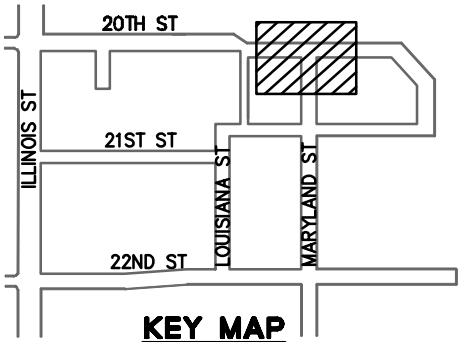
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

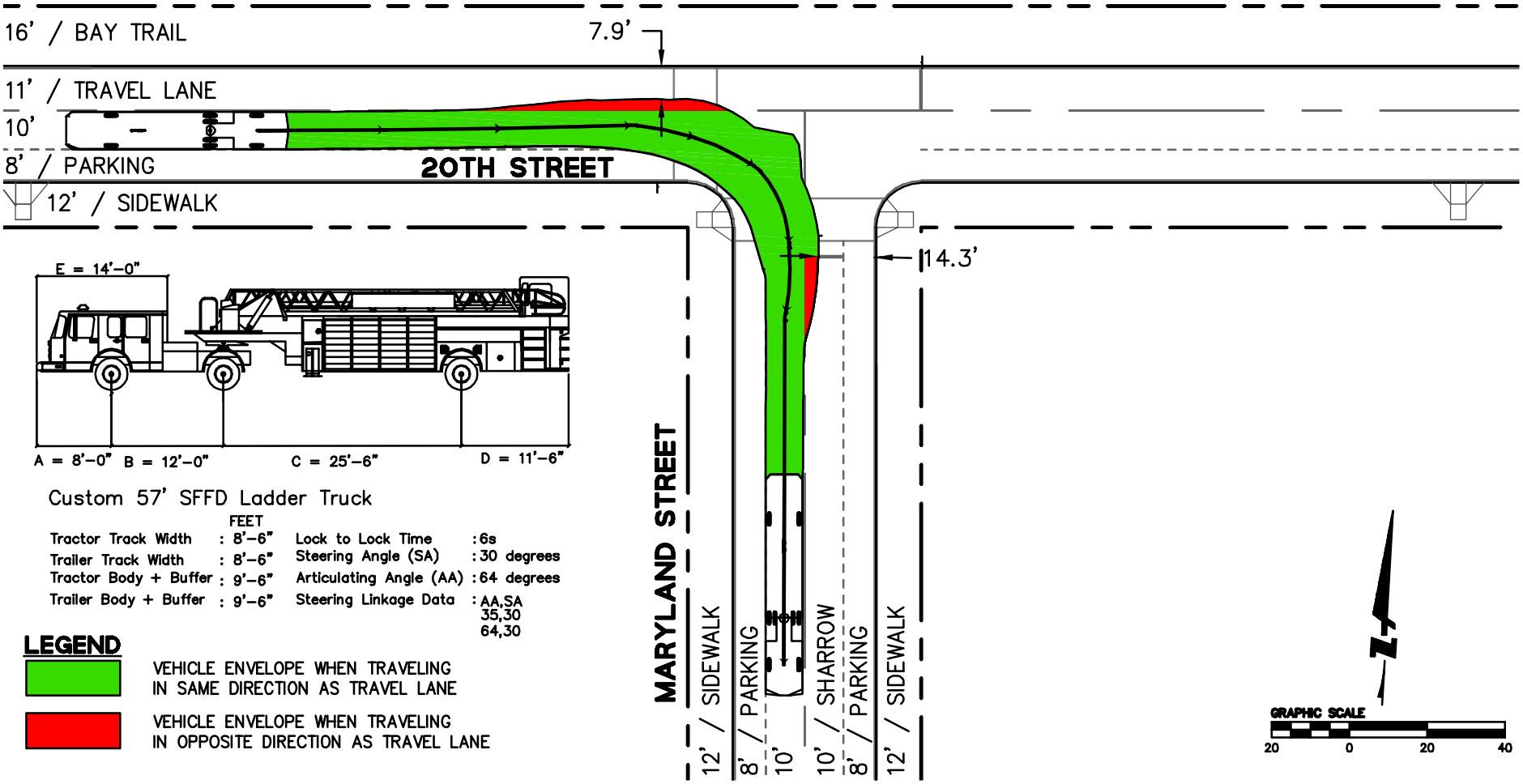
LEGEND

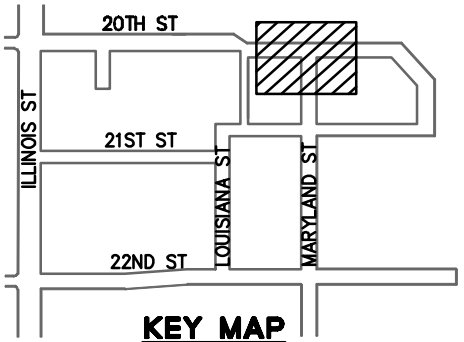
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE




20TH ST
21ST ST
22ND ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
KEY MAP


16' / BAY TRAIL
7.9'
11' / TRAVEL LANE
10'
8' / PARKING
20TH STREET
12' / SIDEWALK
14.3'
MARYLAND STREET
12' / SIDEWALK
8' / PARKING
10'
10' / SHARROW
8' / PARKING
12' / SIDEWALK
E = 14'-0"
A = 8'-0"
B = 12'-0"
C = 25'-6"
D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA 35,30 64,30
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40



16' / BAY TRAIL

11' / TRAVEL LANE

10' / TRAVEL LANE

8' / PARKING

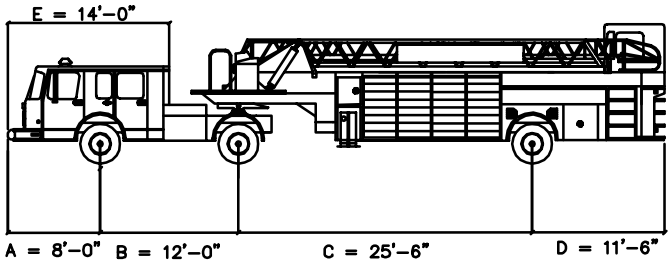
12' / SIDEWALK

20TH STREET

13.5'

MARYLAND STREET

12' / SIDEWALK | 8' / PARKING | 10' / SHARROW | 10' / SHARROW | 8' / PARKING | 12' / SIDEWALK



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

LEGEND

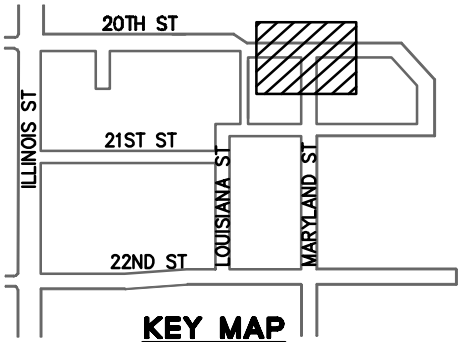
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

N

GRAPHIC SCALE

20 0 20 40



16' / BAY TRAIL

11' / TRAVEL LANE

10' / TRAVEL LANE

8' / PARKING

12' / SIDEWALK

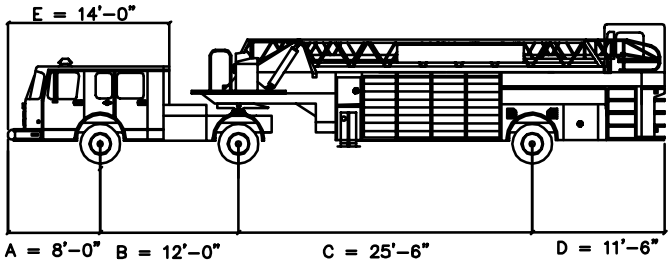
20TH STREET

7.0'

8.8'

MARYLAND STREET

12' / SIDEWALK | 8' / PARKING | 10' / SHARROW | 8' / PARKING | 12' / SIDEWALK



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

LEGEND

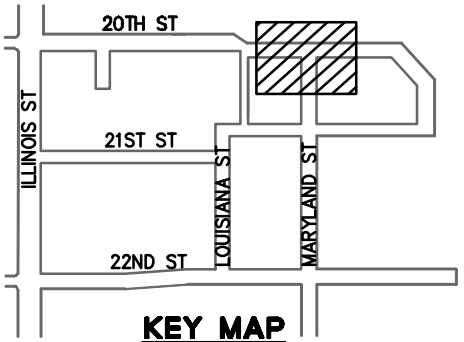
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

N

GRAPHIC SCALE

20 0 20 40



16' / BAY TRAIL

11' / TRAVEL LANE

10' / TRAVEL LANE

8' / PARKING

12' / SIDEWALK

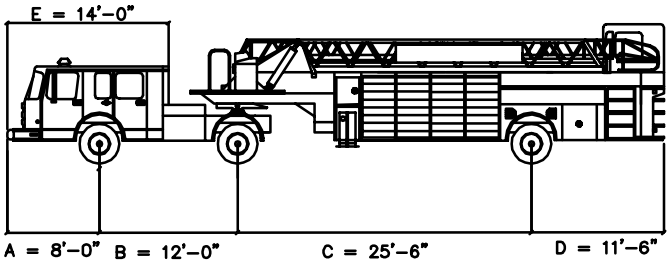
20TH STREET

13.9'

15.3'

MARYLAND STREET

12' / SIDEWALK | 8' / PARKING | 10' / SHARROW | 10' / SHARROW | 8' / PARKING | 12' / SIDEWALK



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

LEGEND

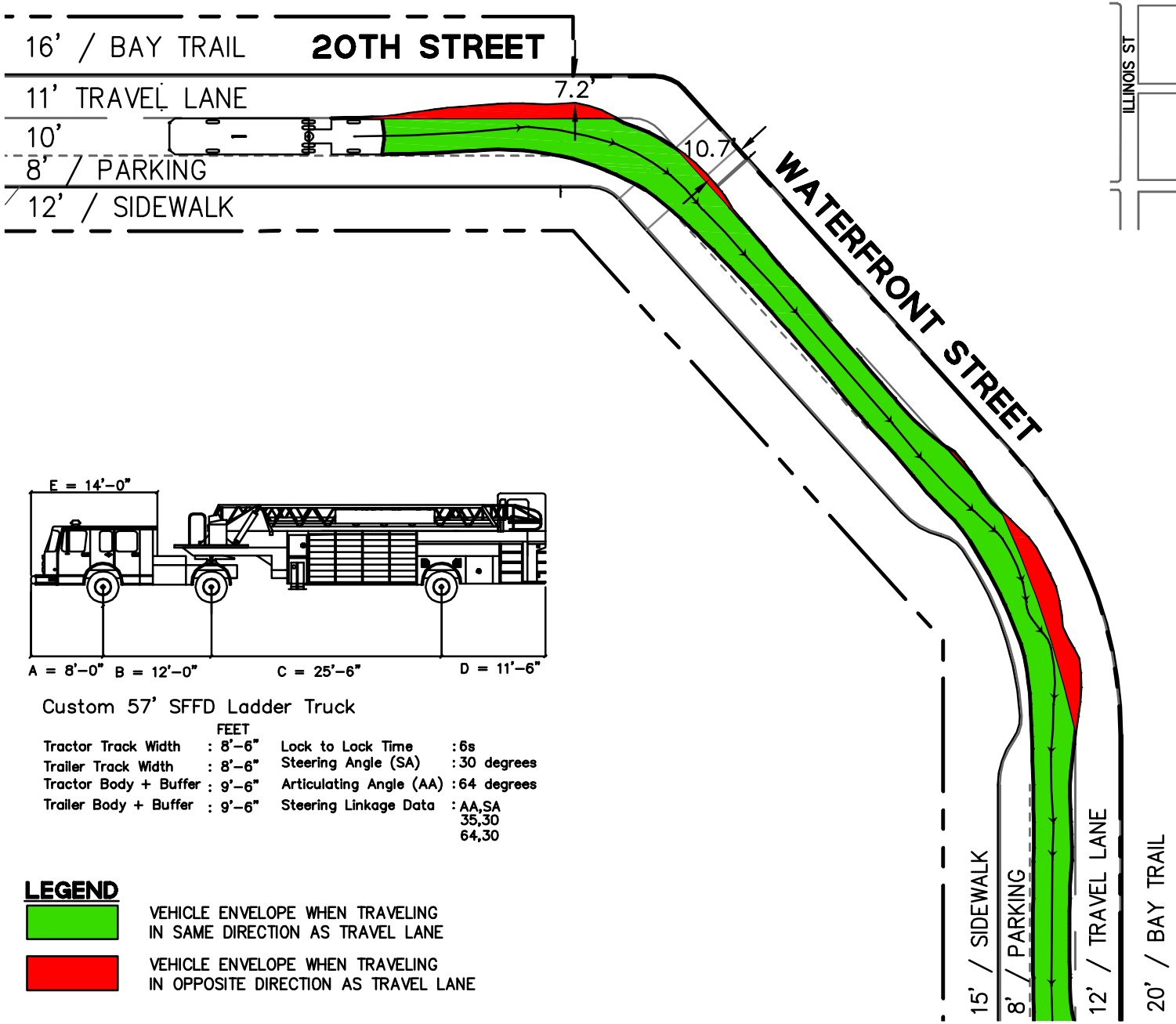
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

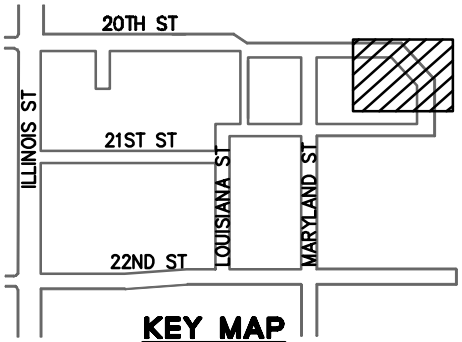
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

N

GRAPHIC SCALE

20 0 20 40





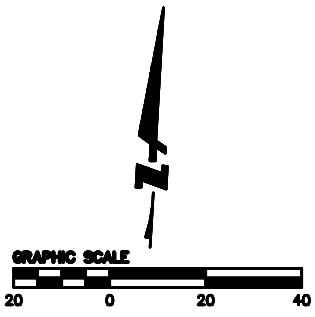
Custom 57' SFFD Ladder Truck

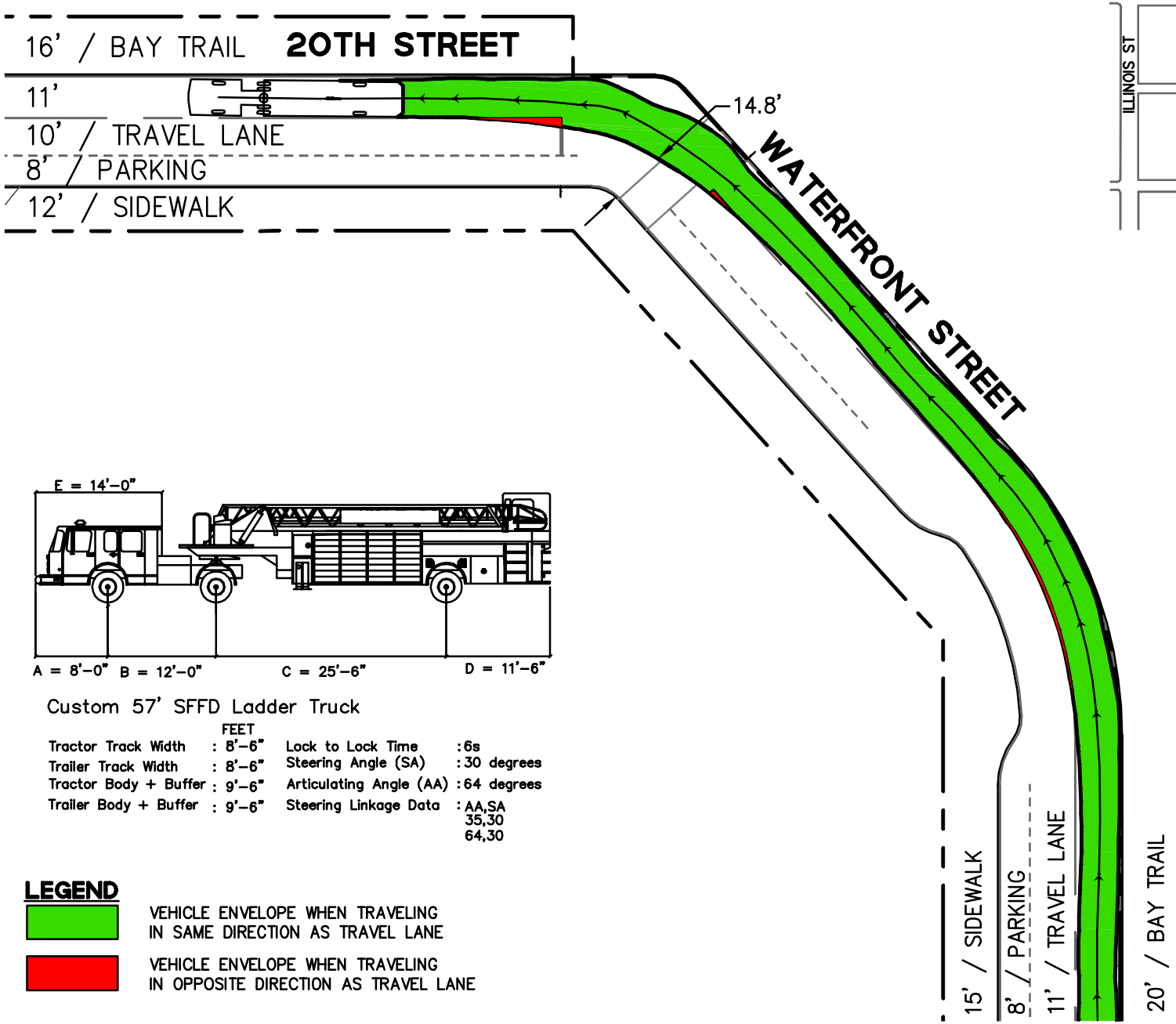
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

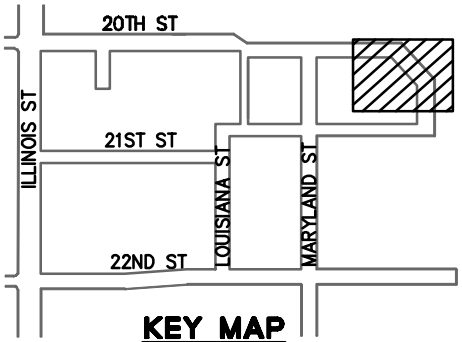
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE







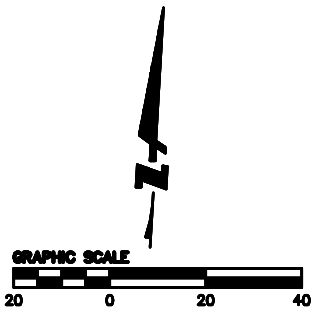
Custom 57' SFFD Ladder Truck

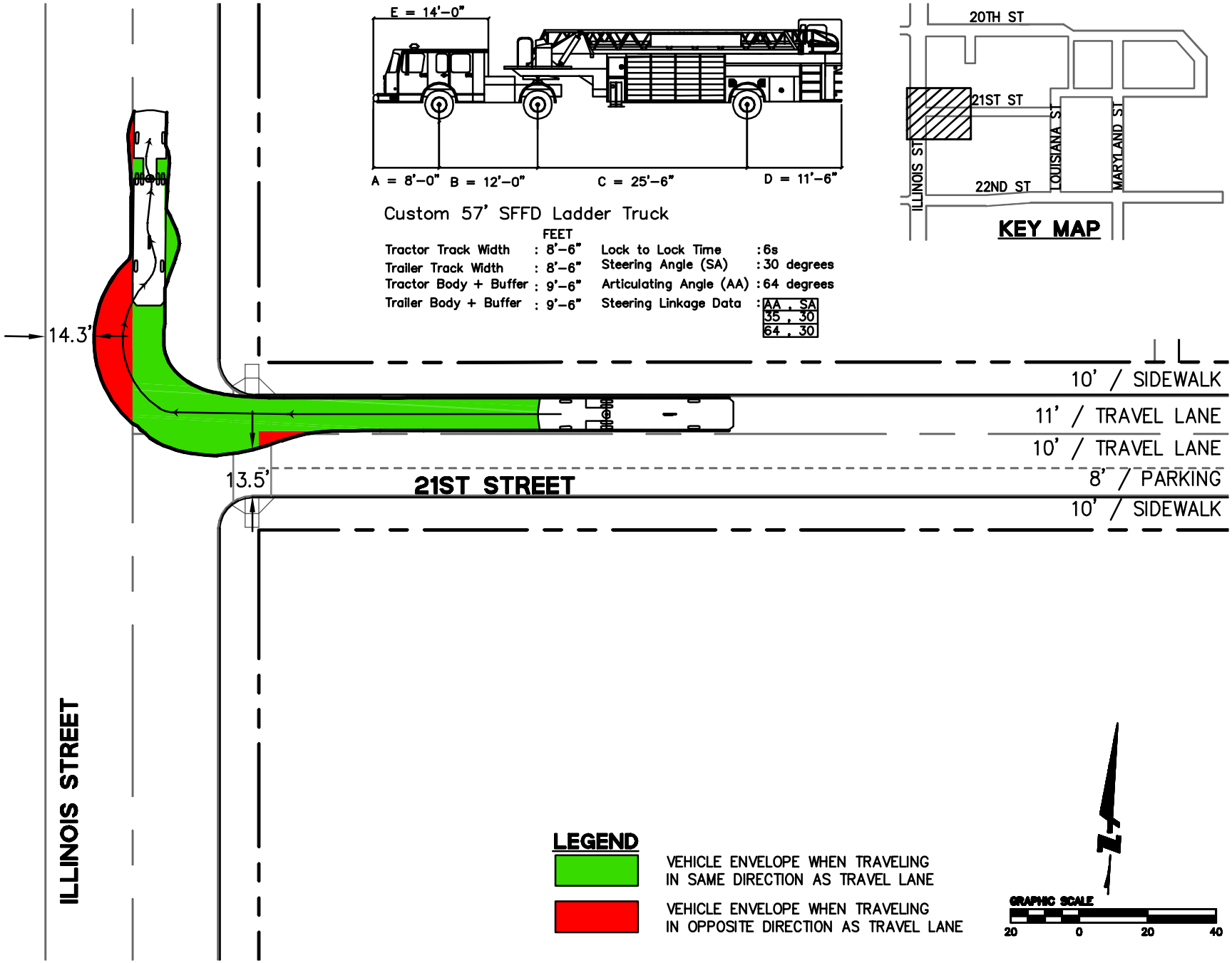
	FEET		
Tractor Track Width	8'-6"	Lock to Lock Time	6s
Trailer Track Width	8'-6"	Steering Angle (SA)	30 degrees
Tractor Body + Buffer	9'-6"	Articulating Angle (AA)	64 degrees
Trailer Body + Buffer	9'-6"	Steering Linkage Data	AA,SA 35,30 64,30

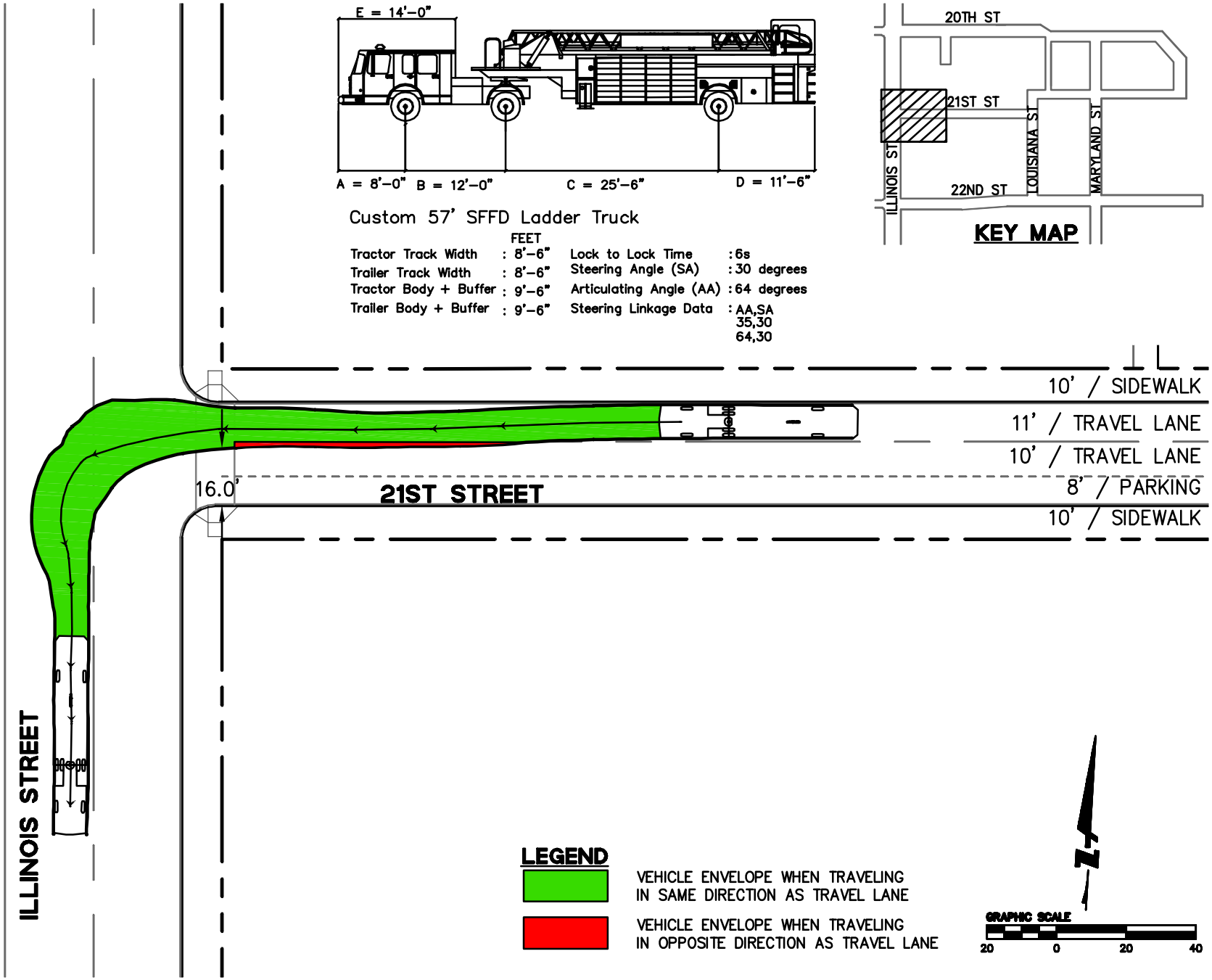
LEGEND

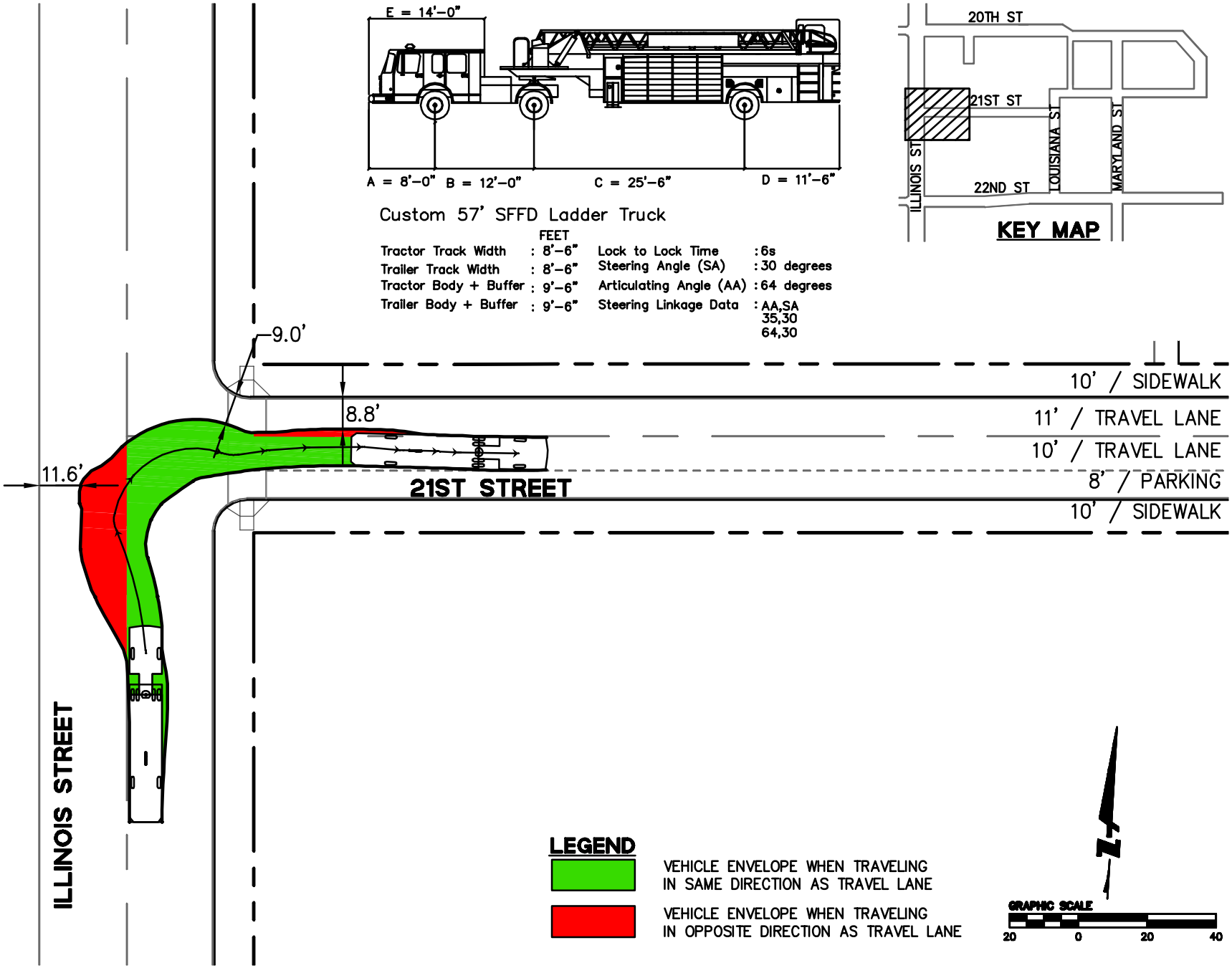
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

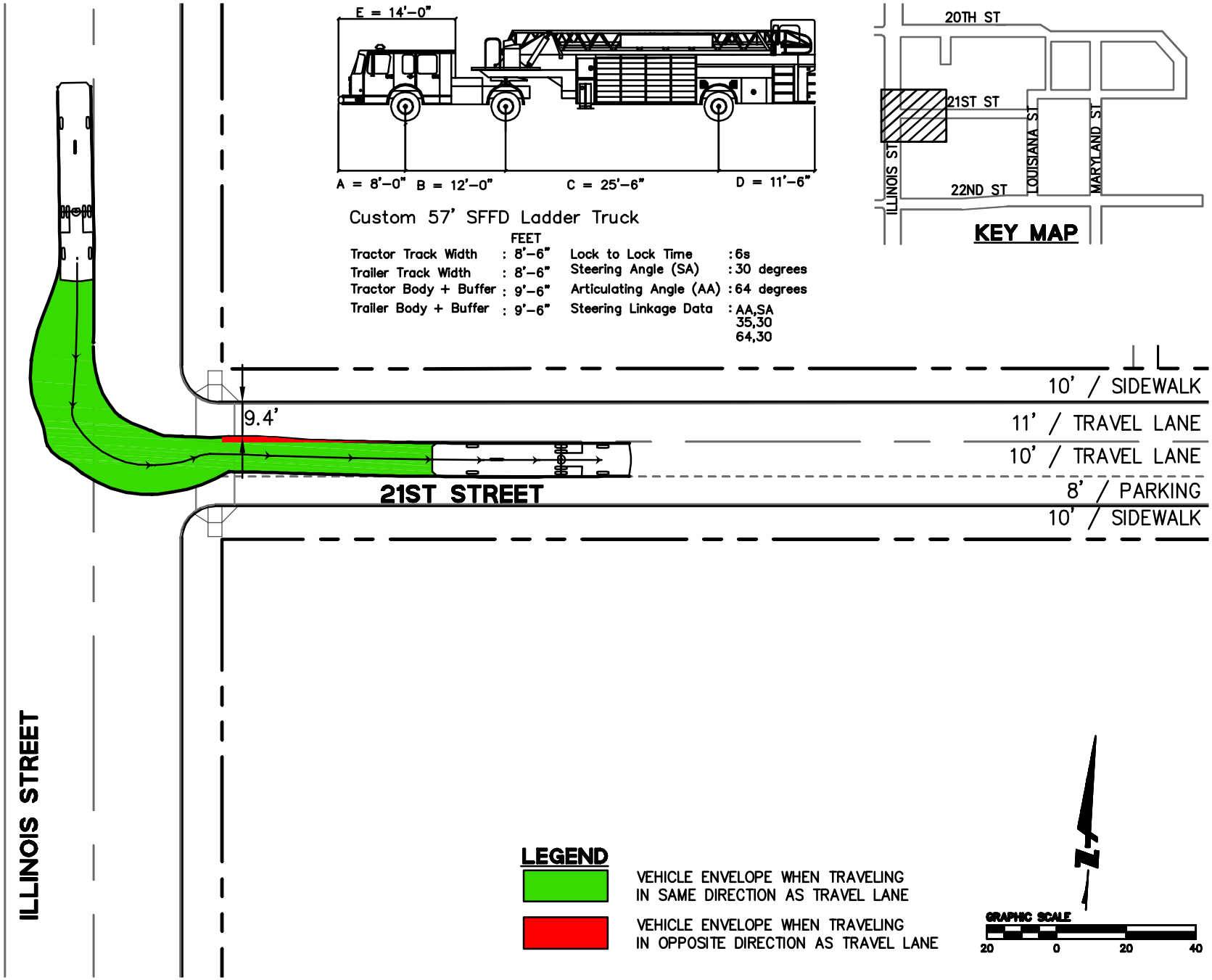
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

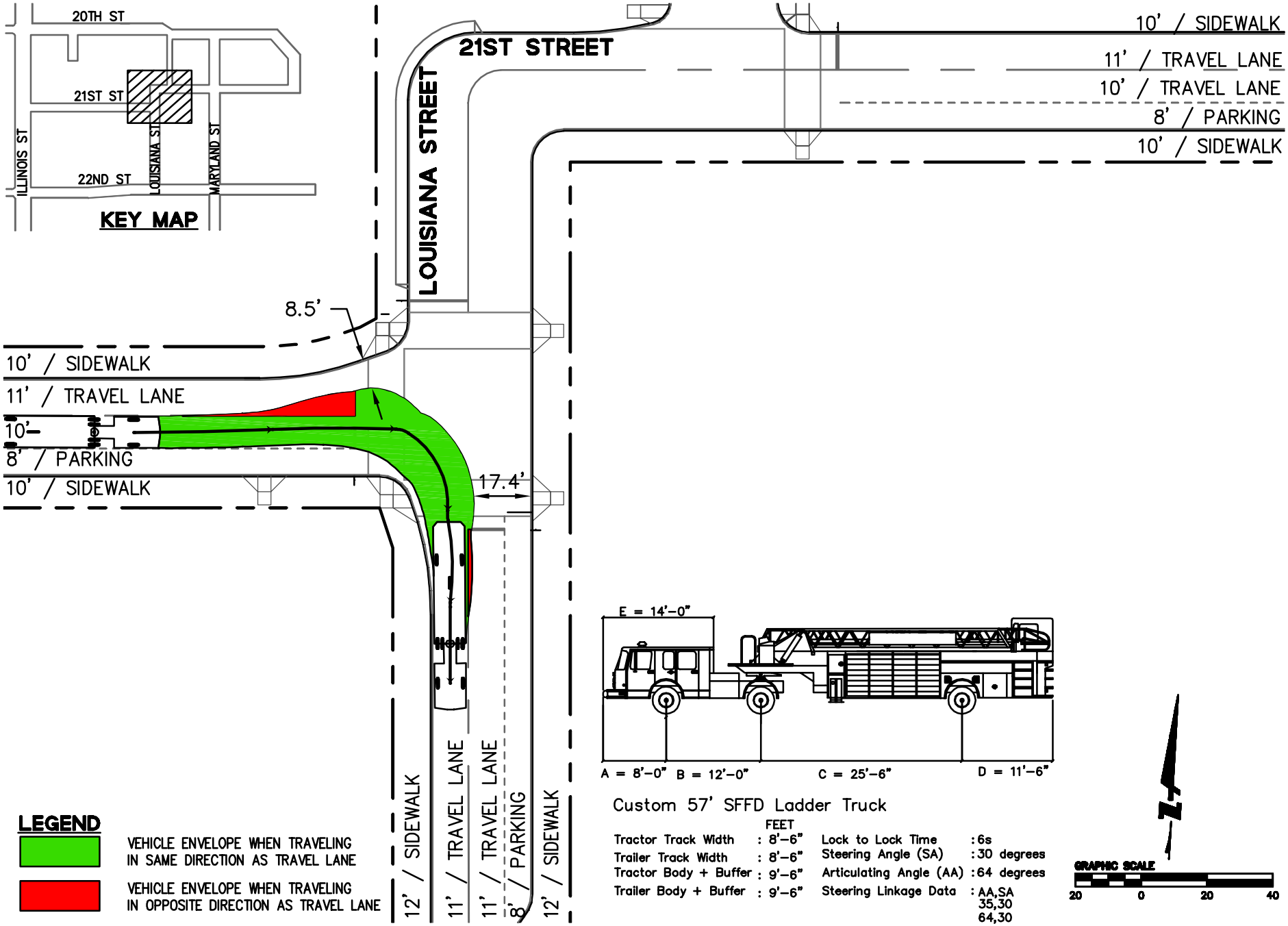


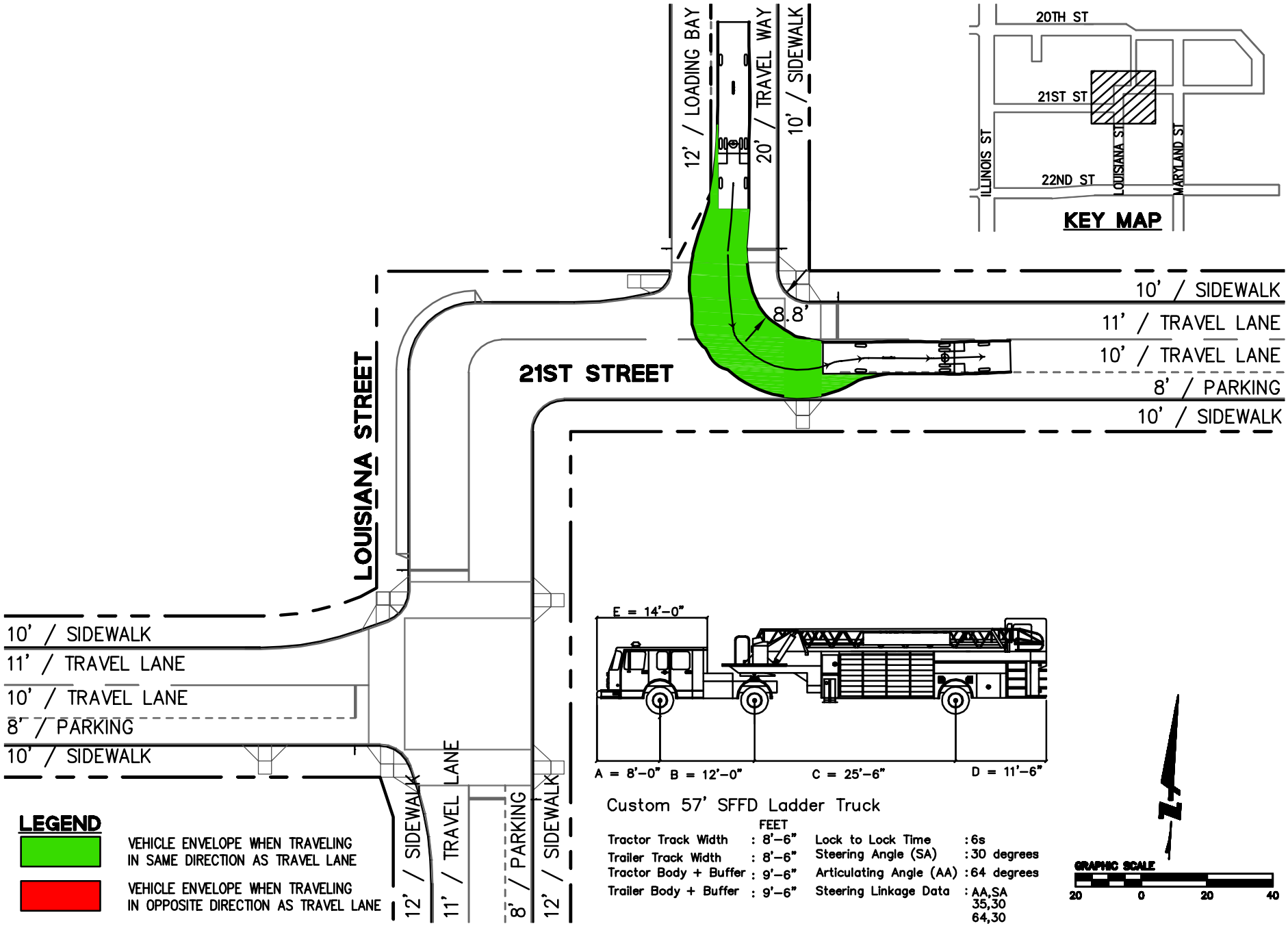

E = 14'-0"
A = 8'-0" B = 12'-0" C = 25'-6" D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data :
AA , SA
35 , 30
64 , 30
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
14.3'
13.5'
21ST STREET
ILLINOIS STREET
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40


E = 14'–0"
A = 8'–0"
B = 12'–0"
C = 25'–6"
D = 11'–6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'–6"
Trailer Track Width : 8'–6"
Tractor Body + Buffer : 9'–6"
Trailer Body + Buffer : 9'–6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
16.0'
21ST STREET
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40


E = 14'-0"
A = 8'-0" B = 12'-0" C = 25'-6" D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
9.0'
8.8'
11.6'
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
21ST STREET
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40

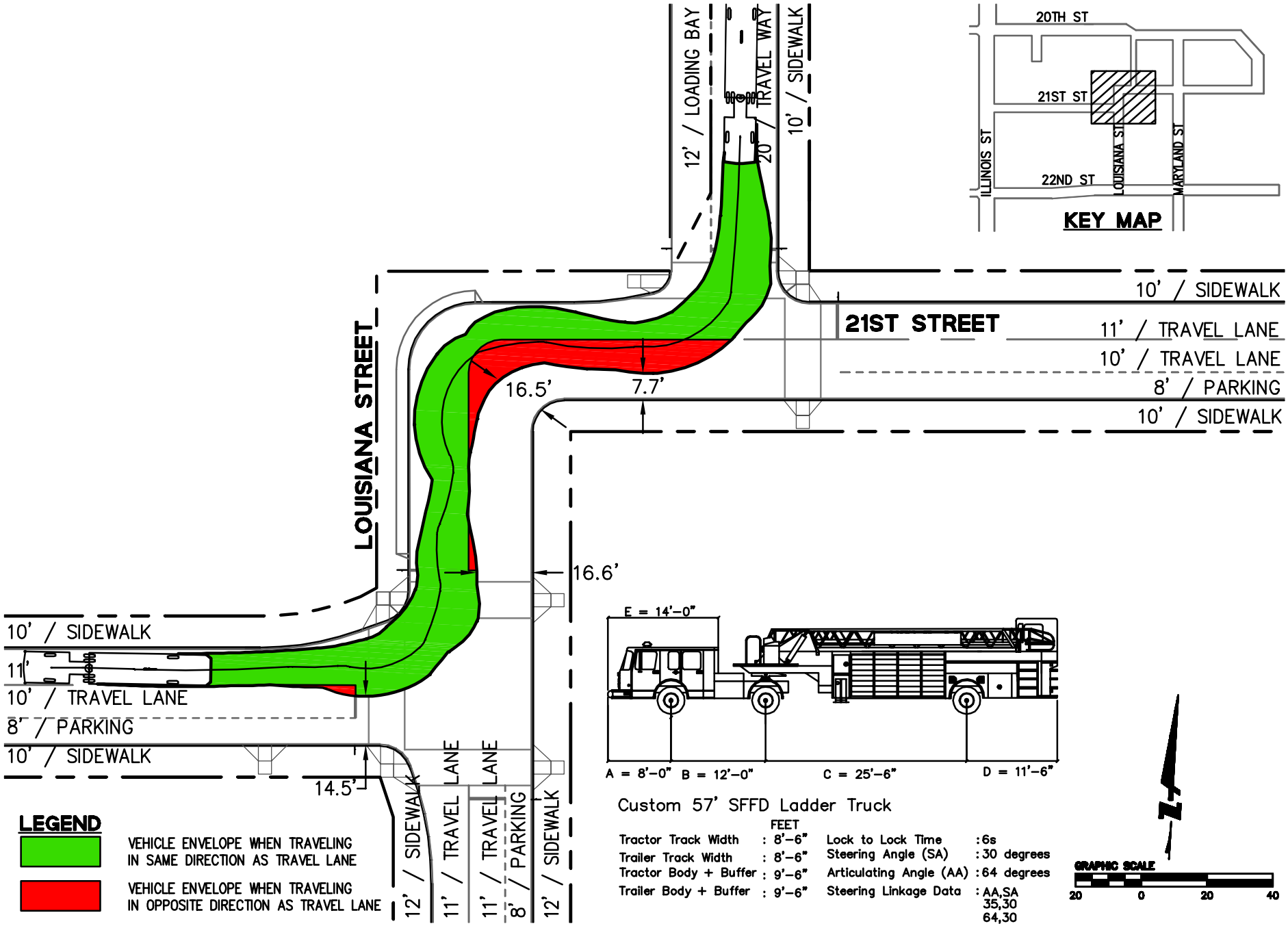

E = 14'-0"
A = 8'-0" B = 12'-0" C = 25'-6" D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
20TH ST
21ST ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
9.4'
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
21ST STREET
ILLINOIS STREET
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
N
GRAPHIC SCALE
20 0 20 40

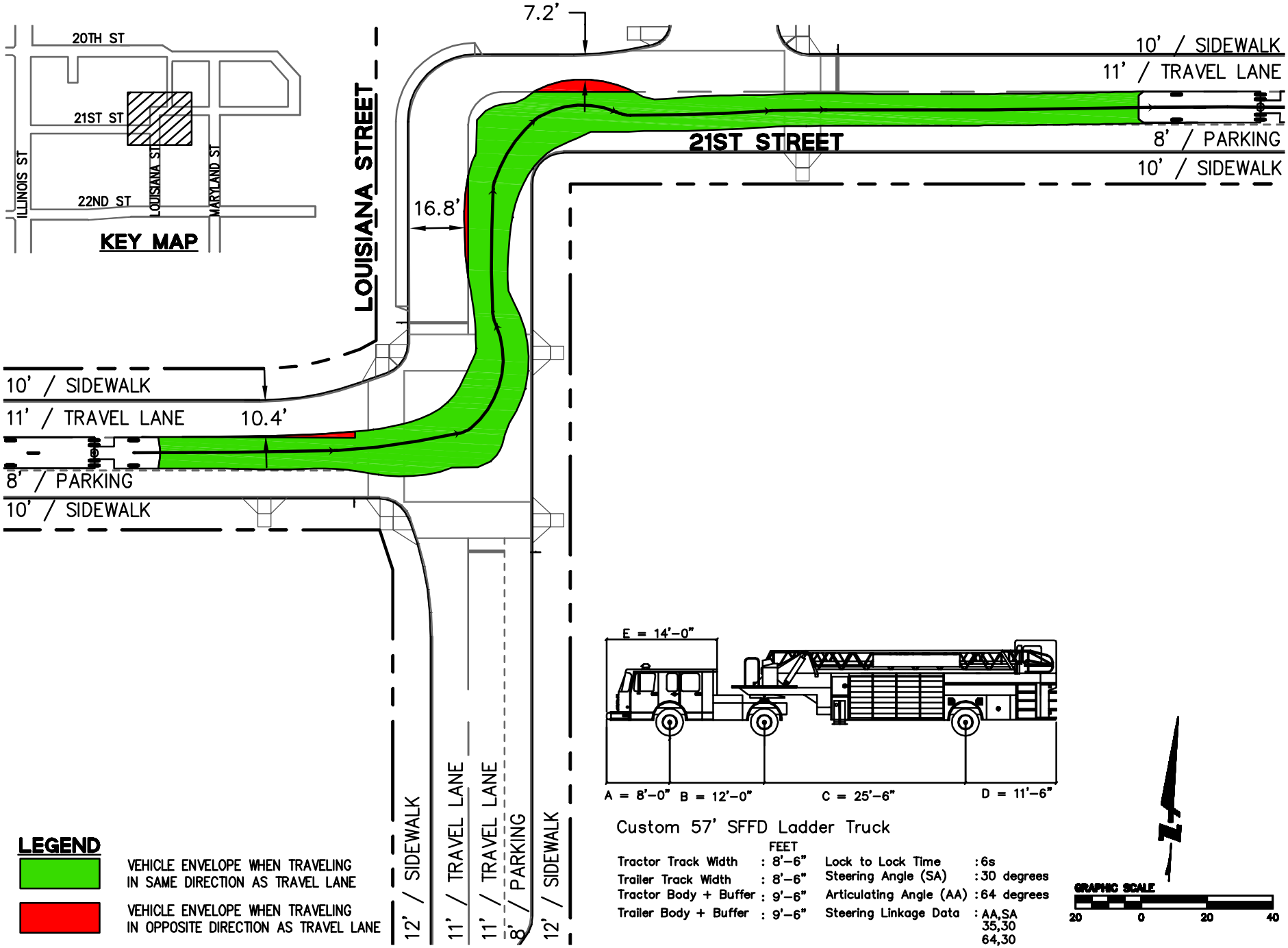

20TH ST
21ST ST
22ND ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
KEY MAP
21ST STREET
LOUISIANA STREET
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
8.5'
10' / SIDEWALK
11' / TRAVEL LANE
10'
8' / PARKING
10' / SIDEWALK
17.4'
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
E = 14'-0"
A = 8'-0"
B = 12'-0"
C = 25'-6"
D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
N
GRAPHIC SCALE
20 0 20 40

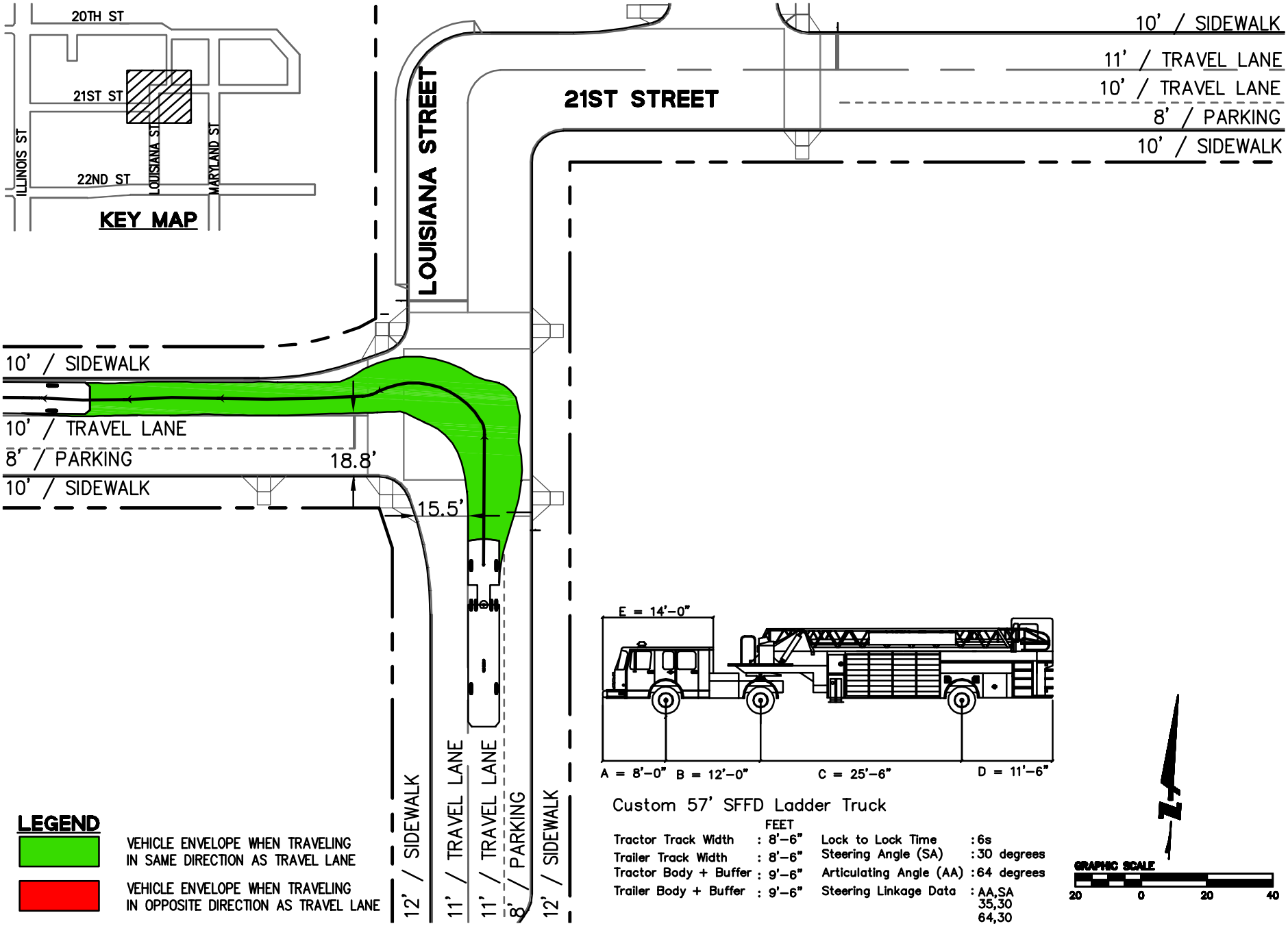


Custom 57' SFFD Ladder Truck

FEET			
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

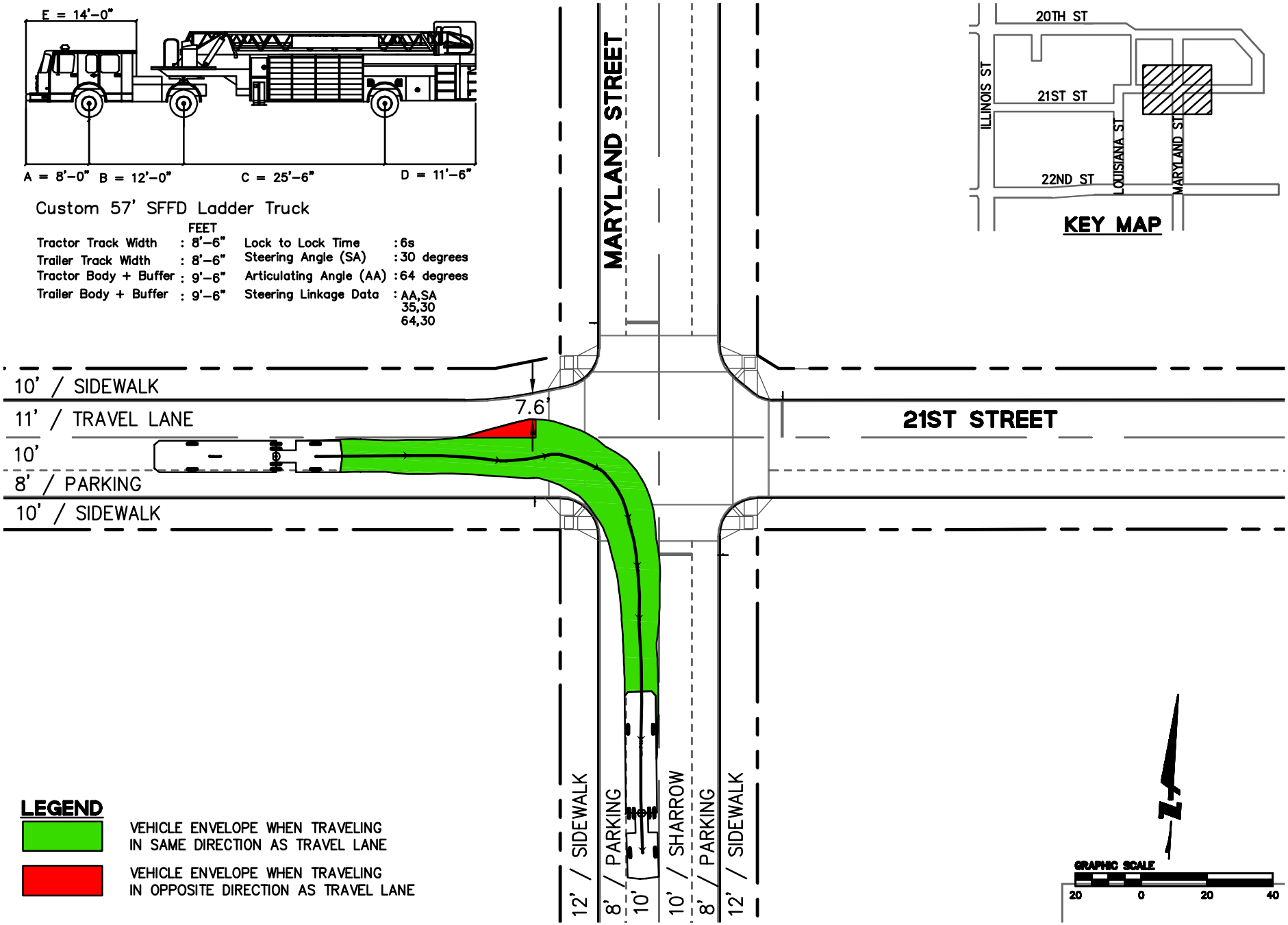

12' / LOADING BAY
20' / TRAVEL WAY
10' / SIDEWALK
20TH ST
21ST ST
22ND ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
KEY MAP
10' / SIDEWALK
21ST STREET
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
LOUISIANA STREET
16.5'
7.7'
16.6'
10' / SIDEWALK
11'
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
14.5'
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
E = 14'-0"
A = 8'-0" B = 12'-0" C = 25'-6" D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
GRAPHIC SCALE
20 0 20 40


20TH ST
21ST ST
22ND ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
KEY MAP
LOUISIANA STREET
7.2'
16.8'
10.4'
21ST STREET
10' / SIDEWALK
11' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
10' / SIDEWALK
11' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
E = 14'-0"
A = 8'-0"
B = 12'-0"
C = 25'-6"
D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
GRAPHIC SCALE
20 0 20 40


20TH ST
21ST ST
22ND ST
ILLINOIS ST
LOUISIANA ST
MARYLAND ST
KEY MAP
LOUISIANA STREET
21ST STREET
10' / SIDEWALK
11' / TRAVEL LANE
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
10' / SIDEWALK
10' / TRAVEL LANE
8' / PARKING
10' / SIDEWALK
18.8'
15.5'
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
LEGEND
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE
E = 14'-0"
A = 8'-0"
B = 12'-0"
C = 25'-6"
D = 11'-6"
Custom 57' SFFD Ladder Truck
FEET
Tractor Track Width : 8'-6"
Trailer Track Width : 8'-6"
Tractor Body + Buffer : 9'-6"
Trailer Body + Buffer : 9'-6"
Lock to Lock Time : 6s
Steering Angle (SA) : 30 degrees
Articulating Angle (AA) : 64 degrees
Steering Linkage Data : AA,SA
35,30
64,30
N
GRAPHIC SCALE
20 0 20 40

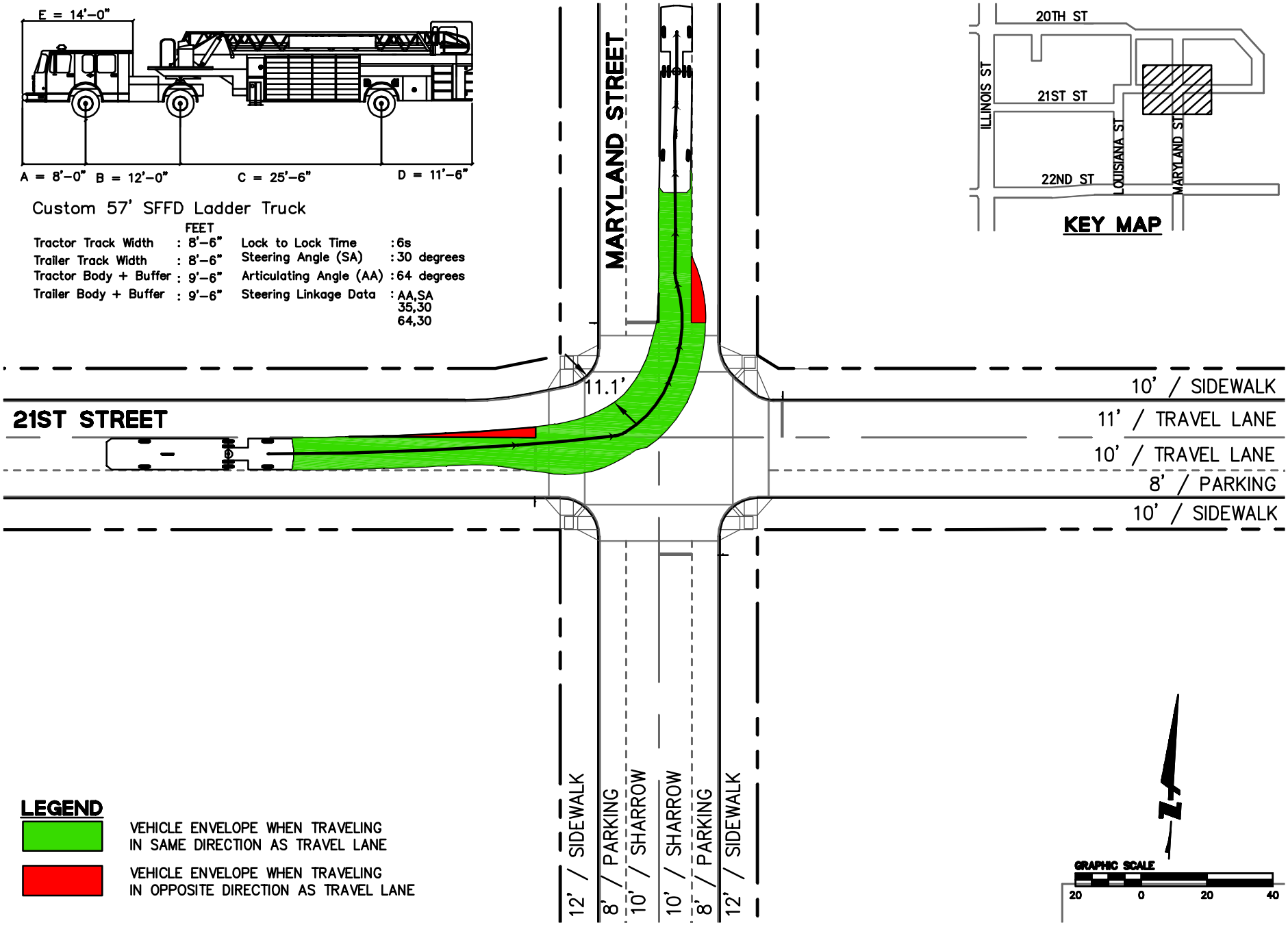
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



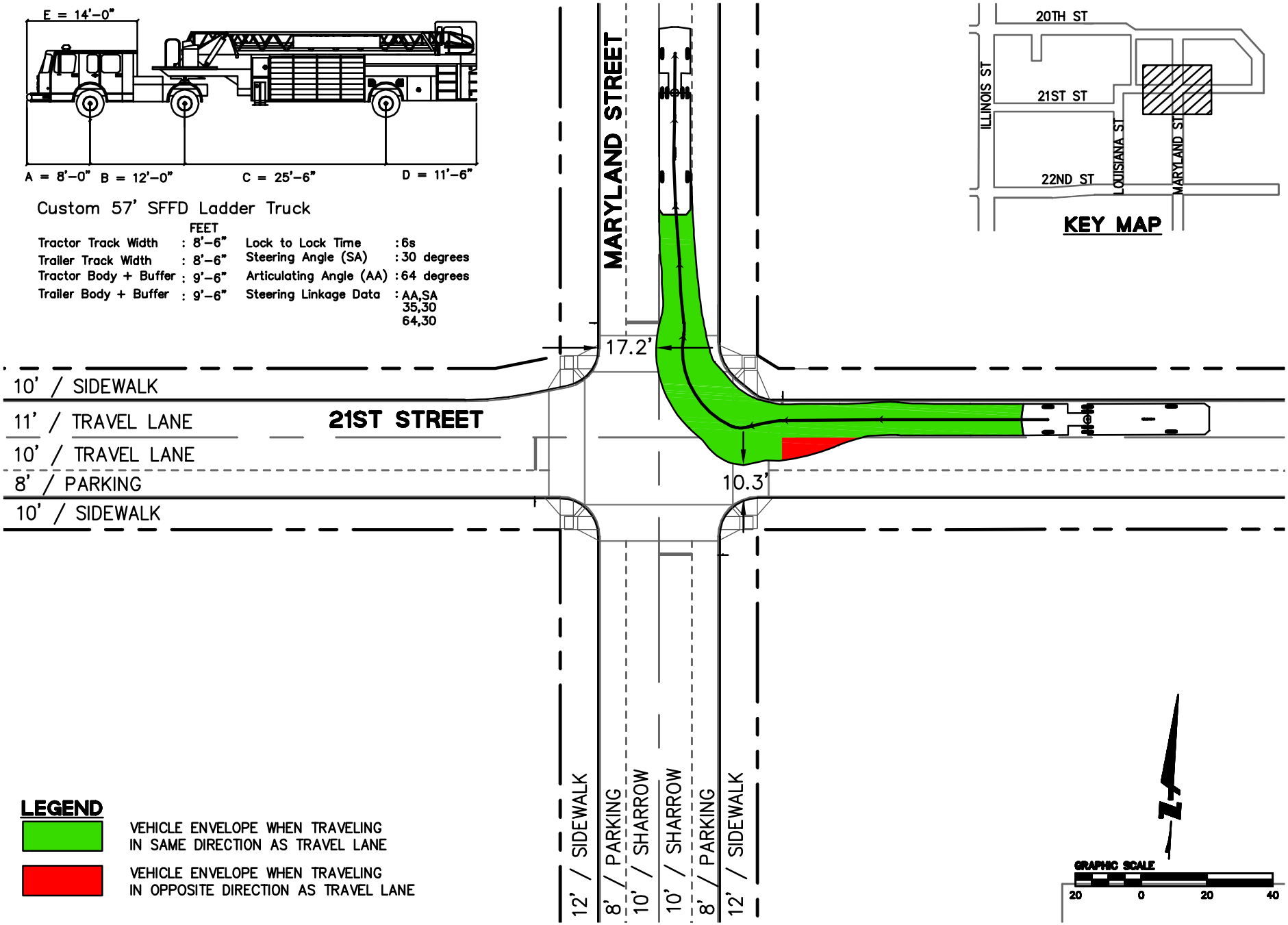
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



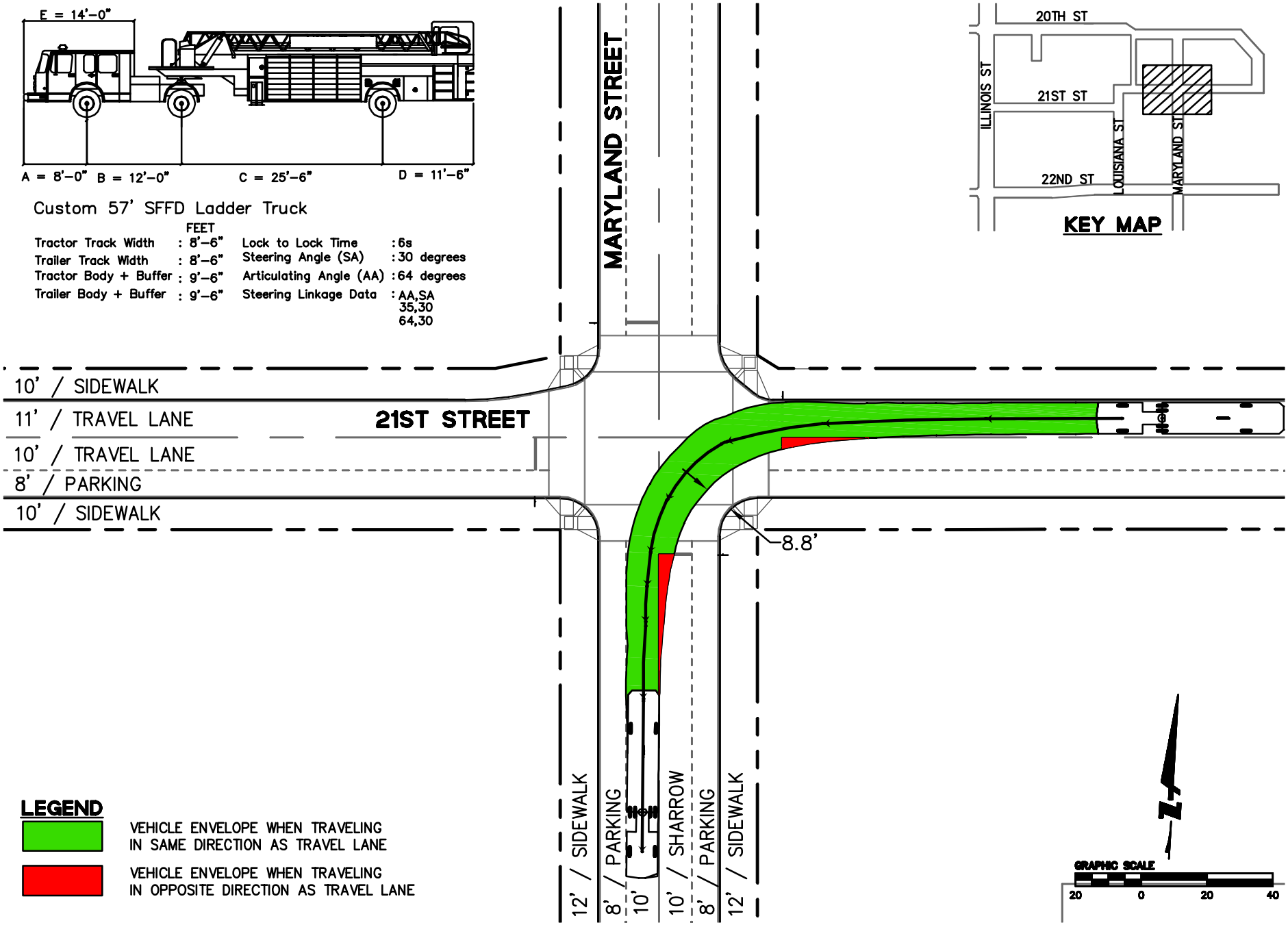
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

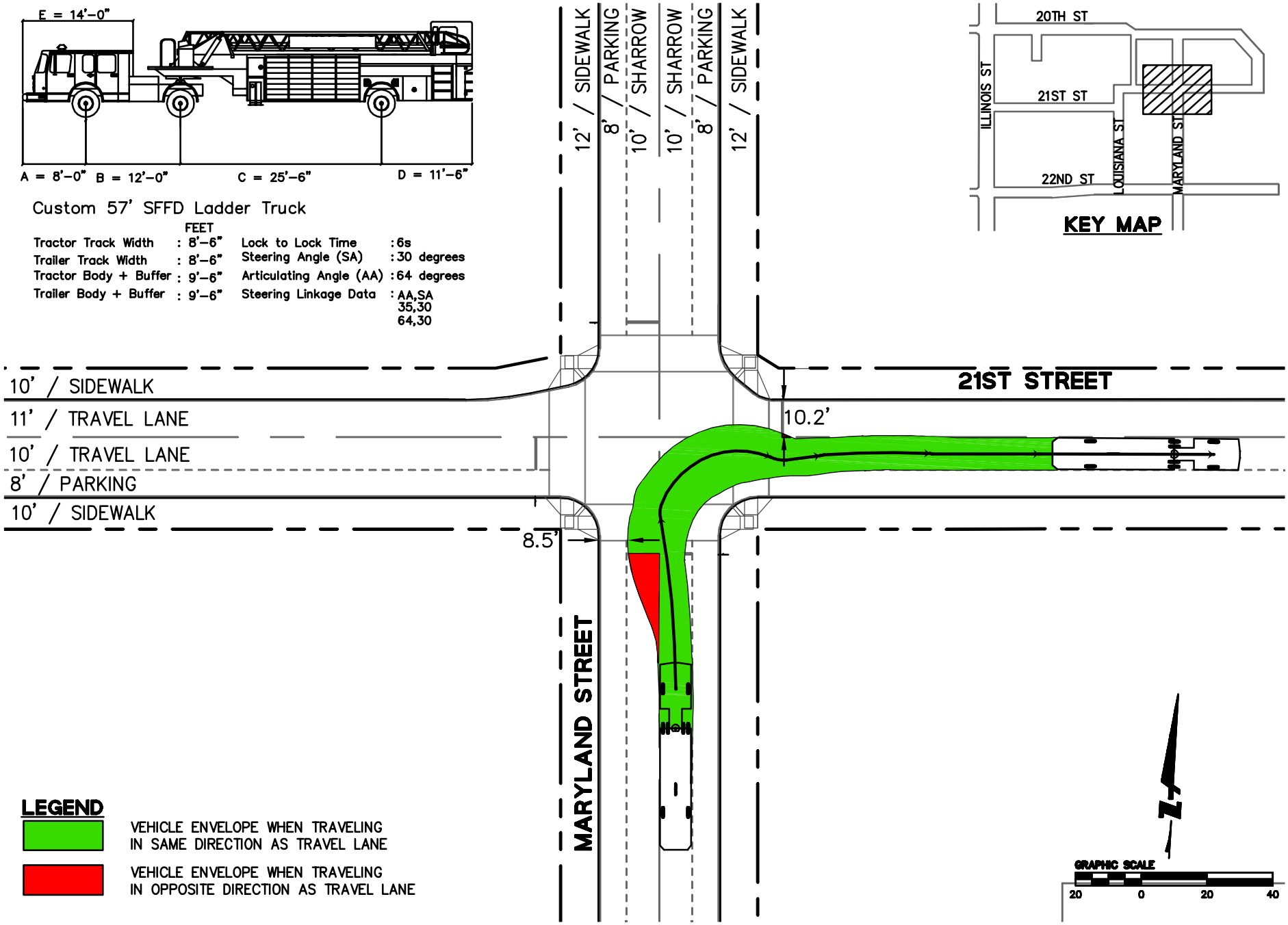
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



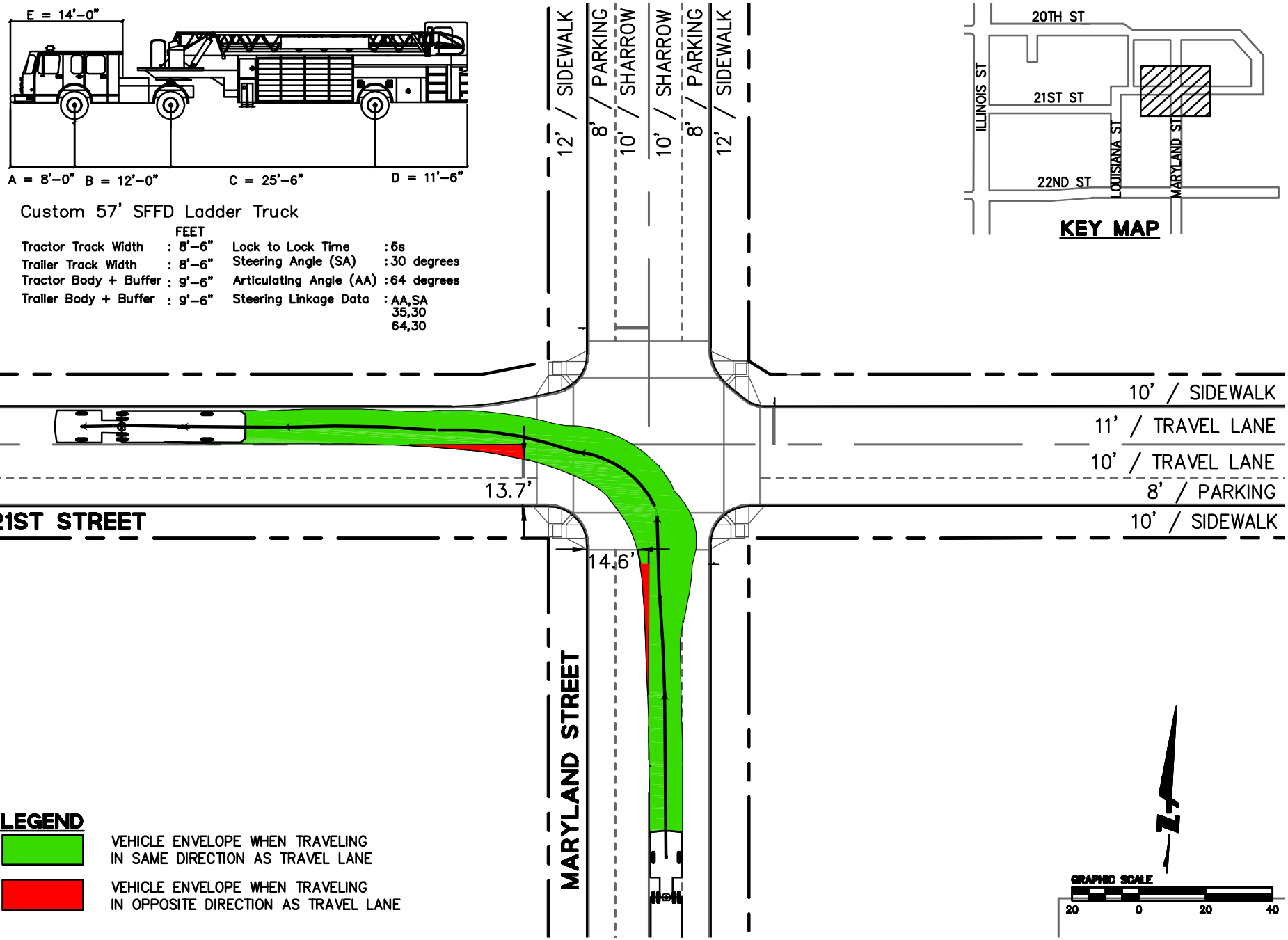
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



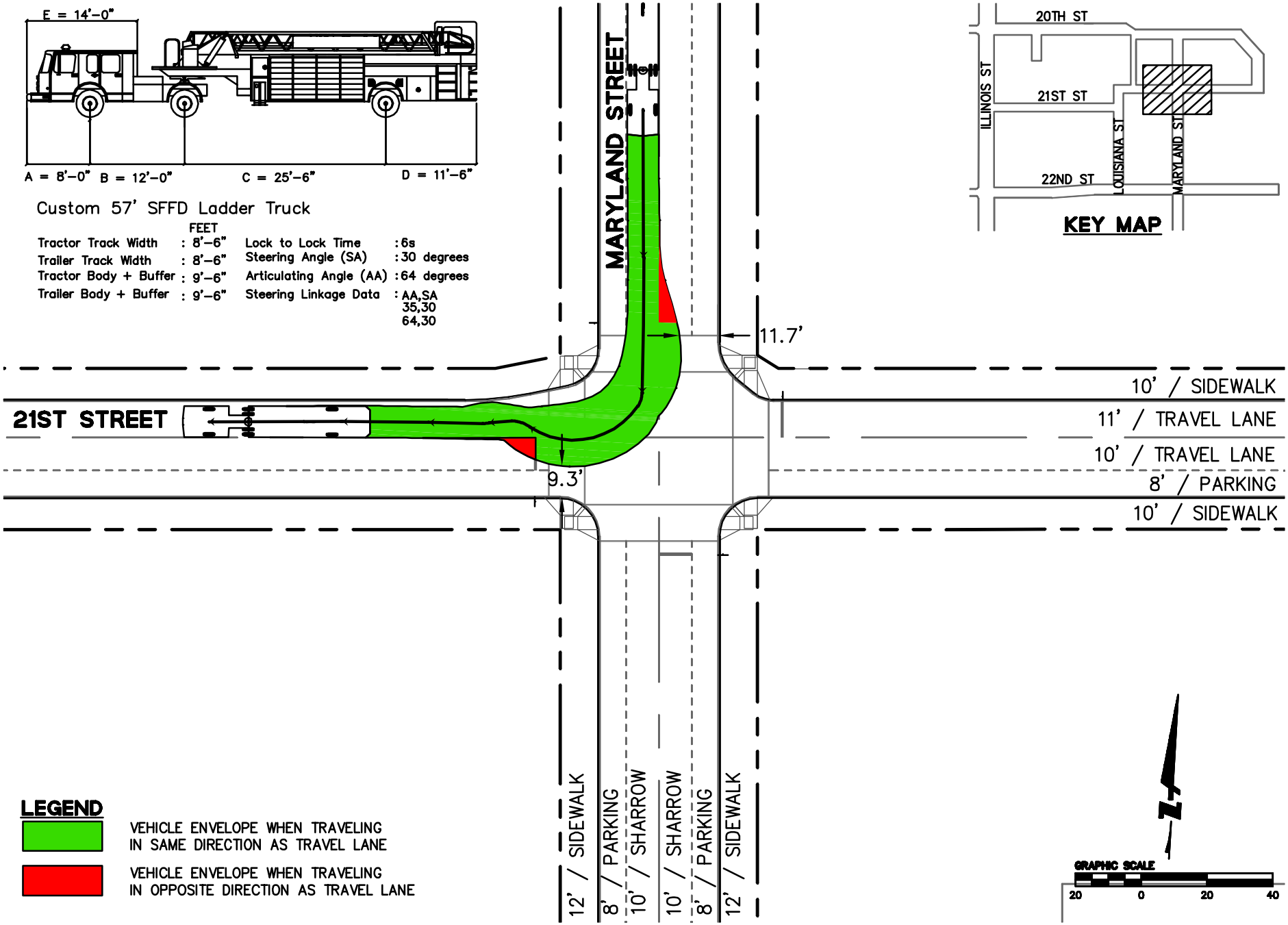
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



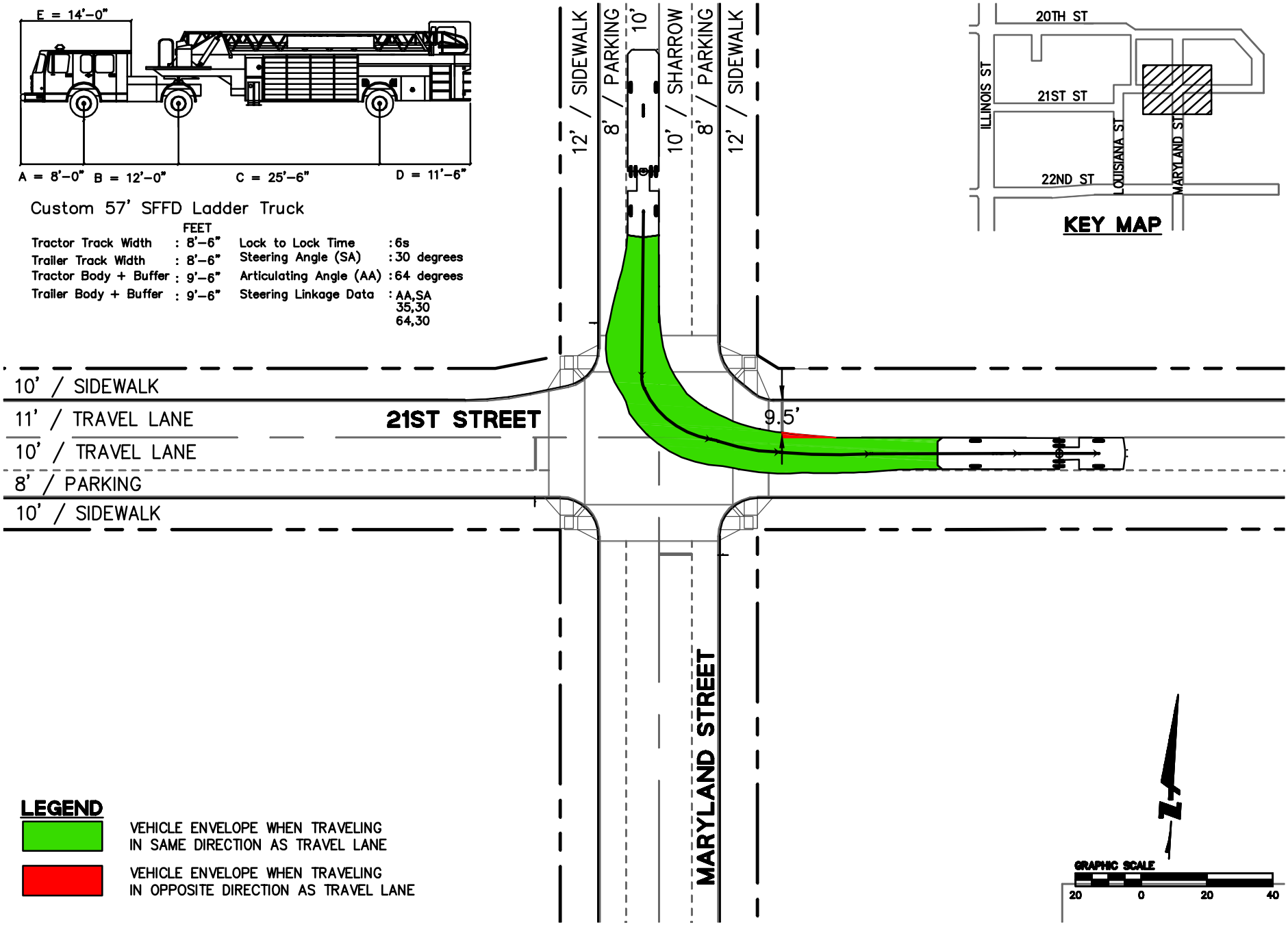
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

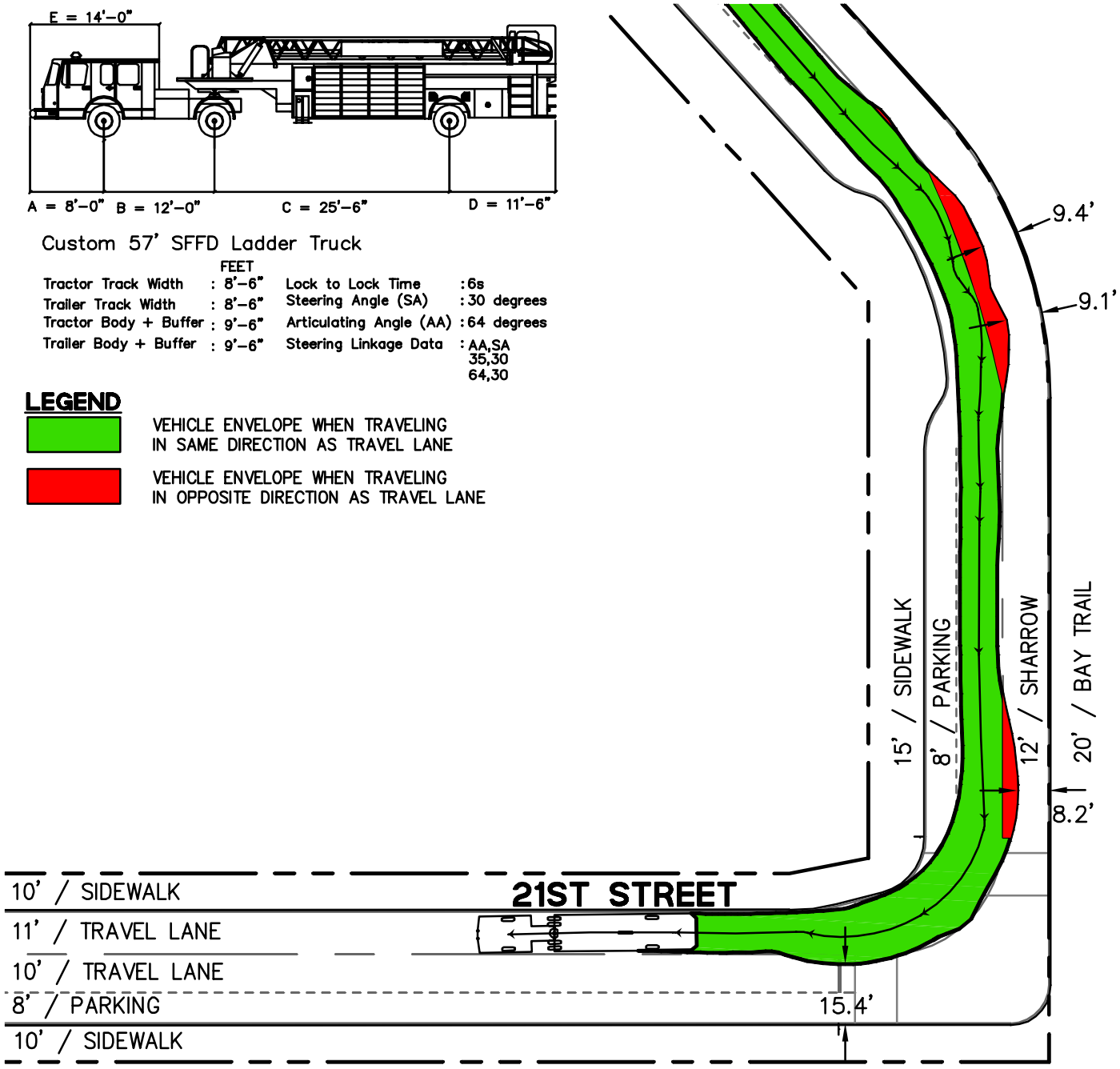
Custom 57' SFFD Ladder Truck

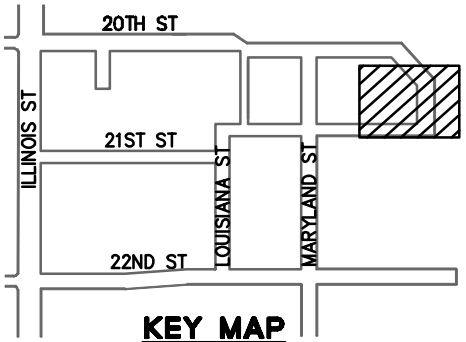
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

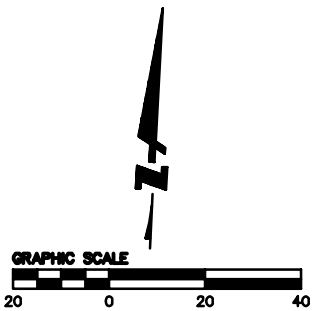
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE







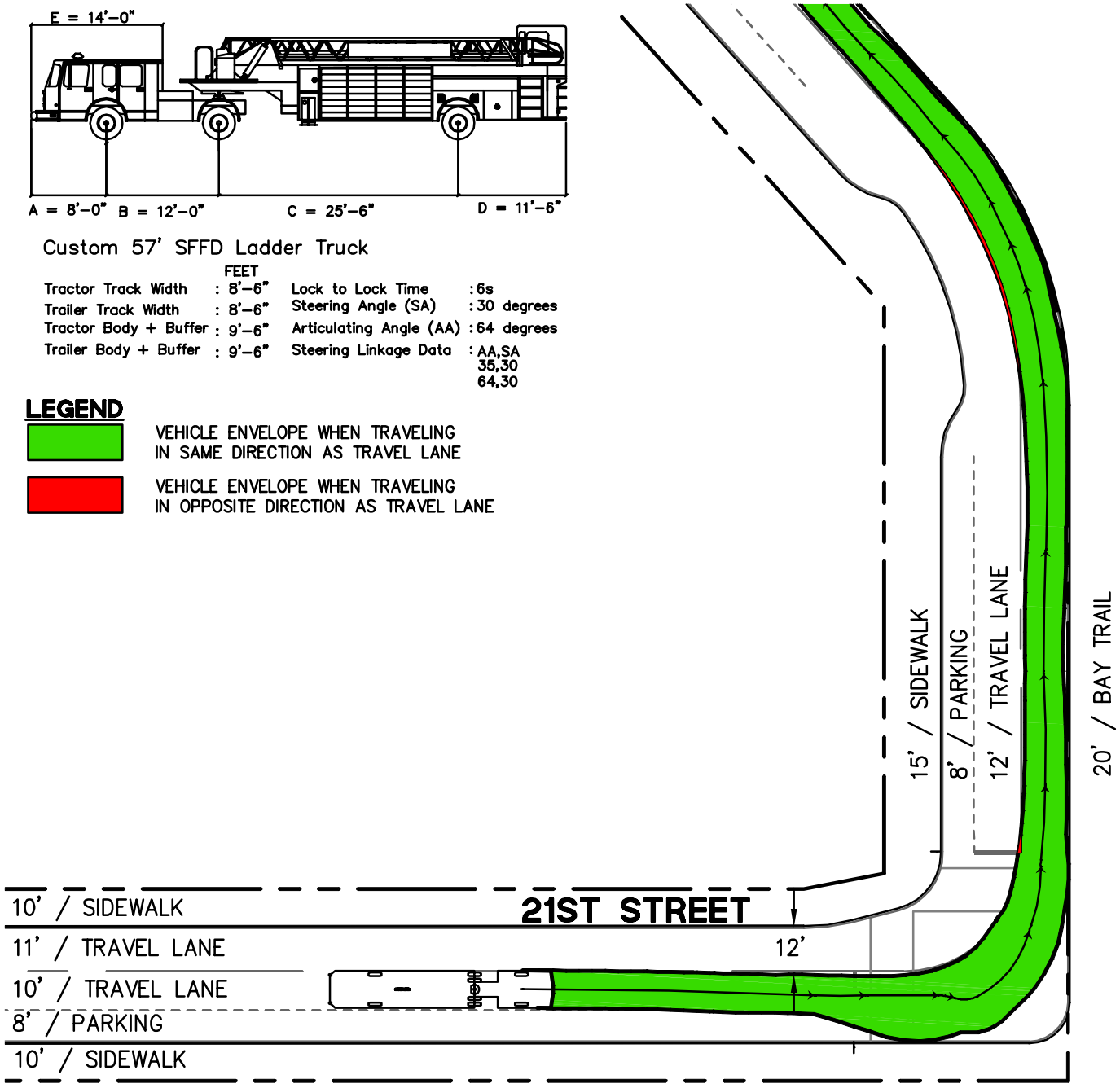
Custom 57' SFFD Ladder Truck

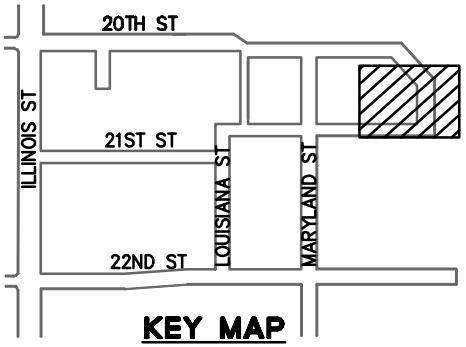
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

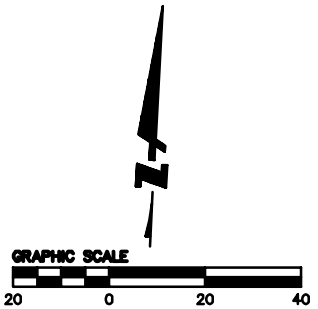
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

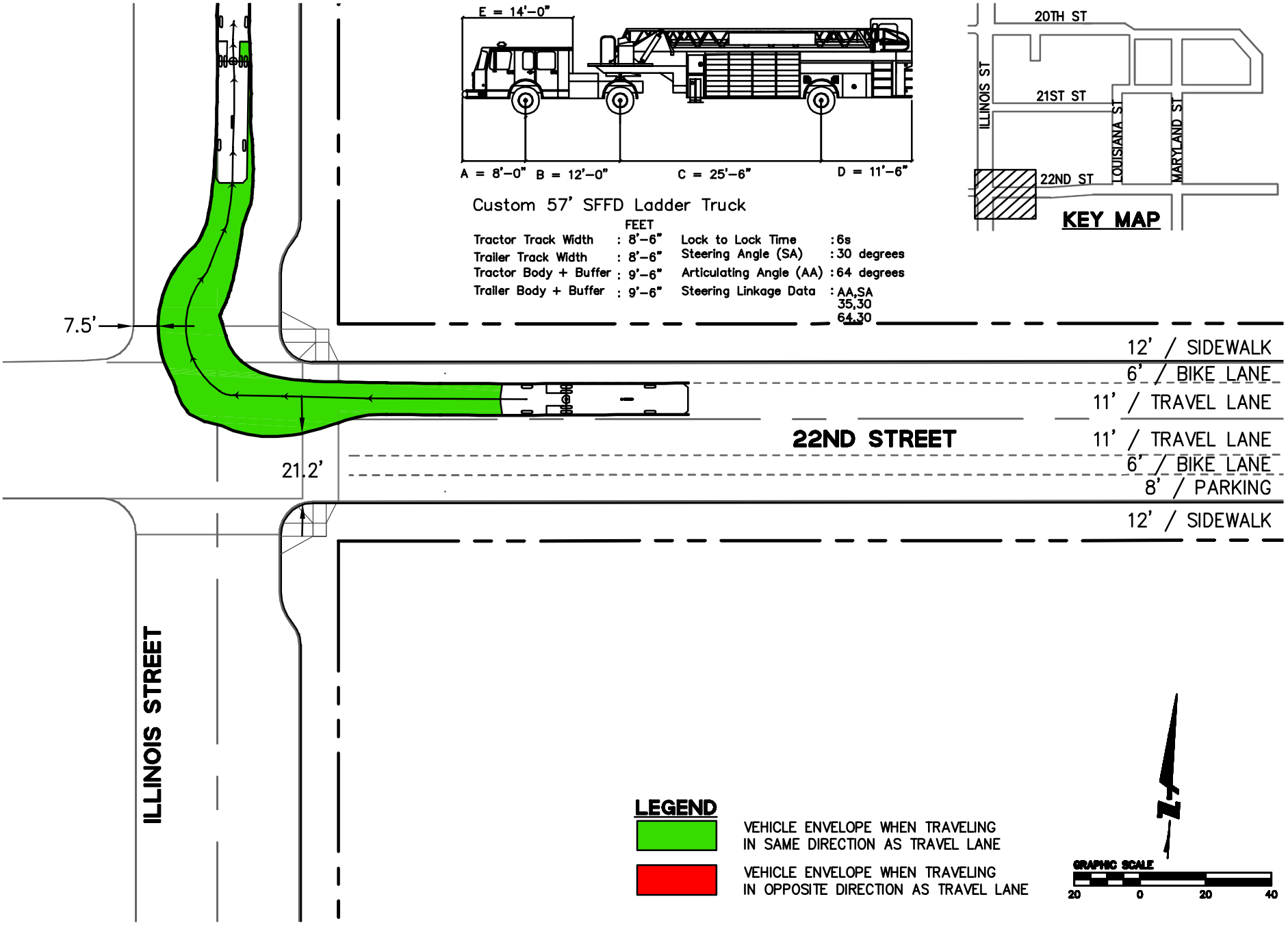






Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



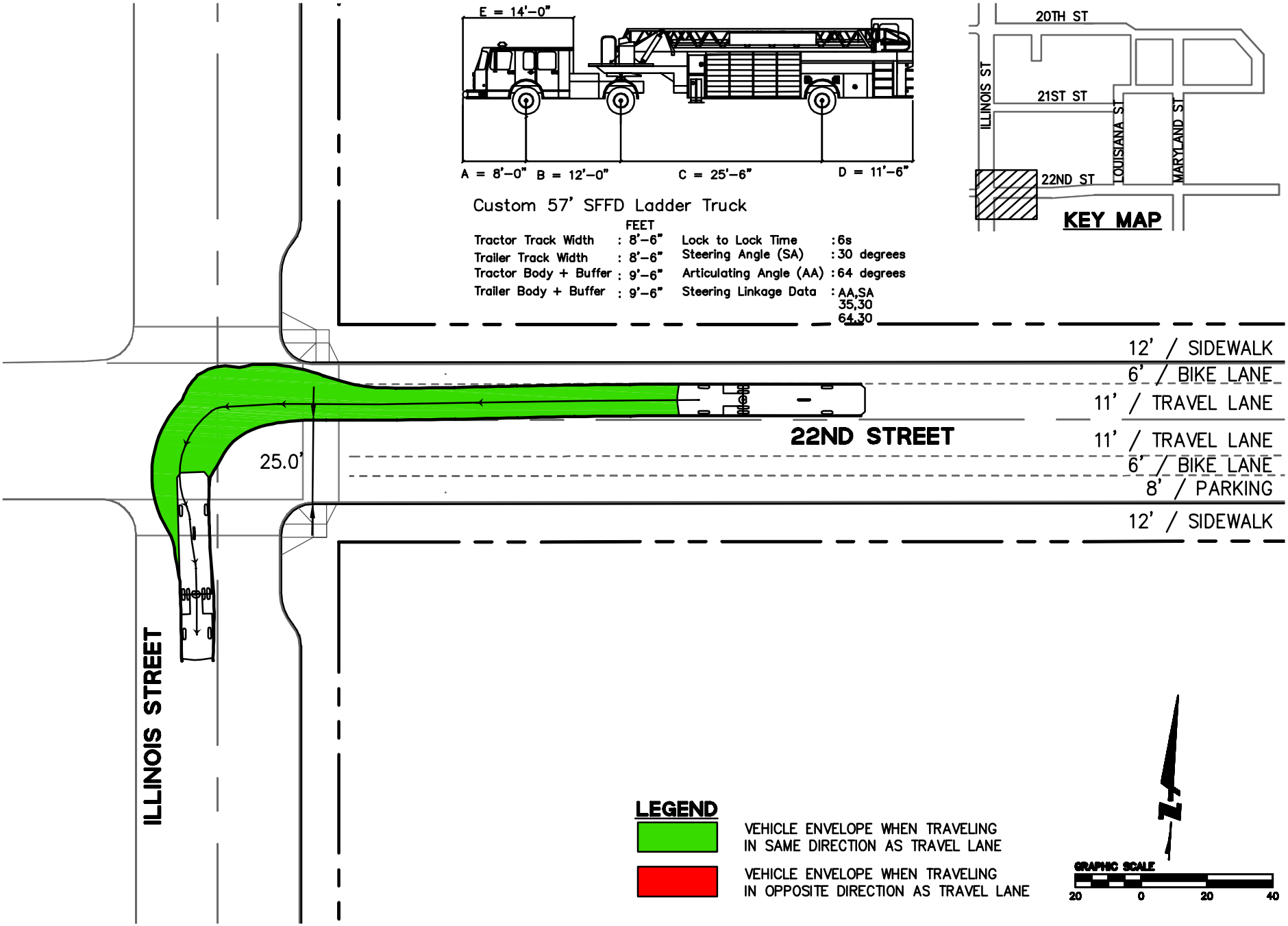
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



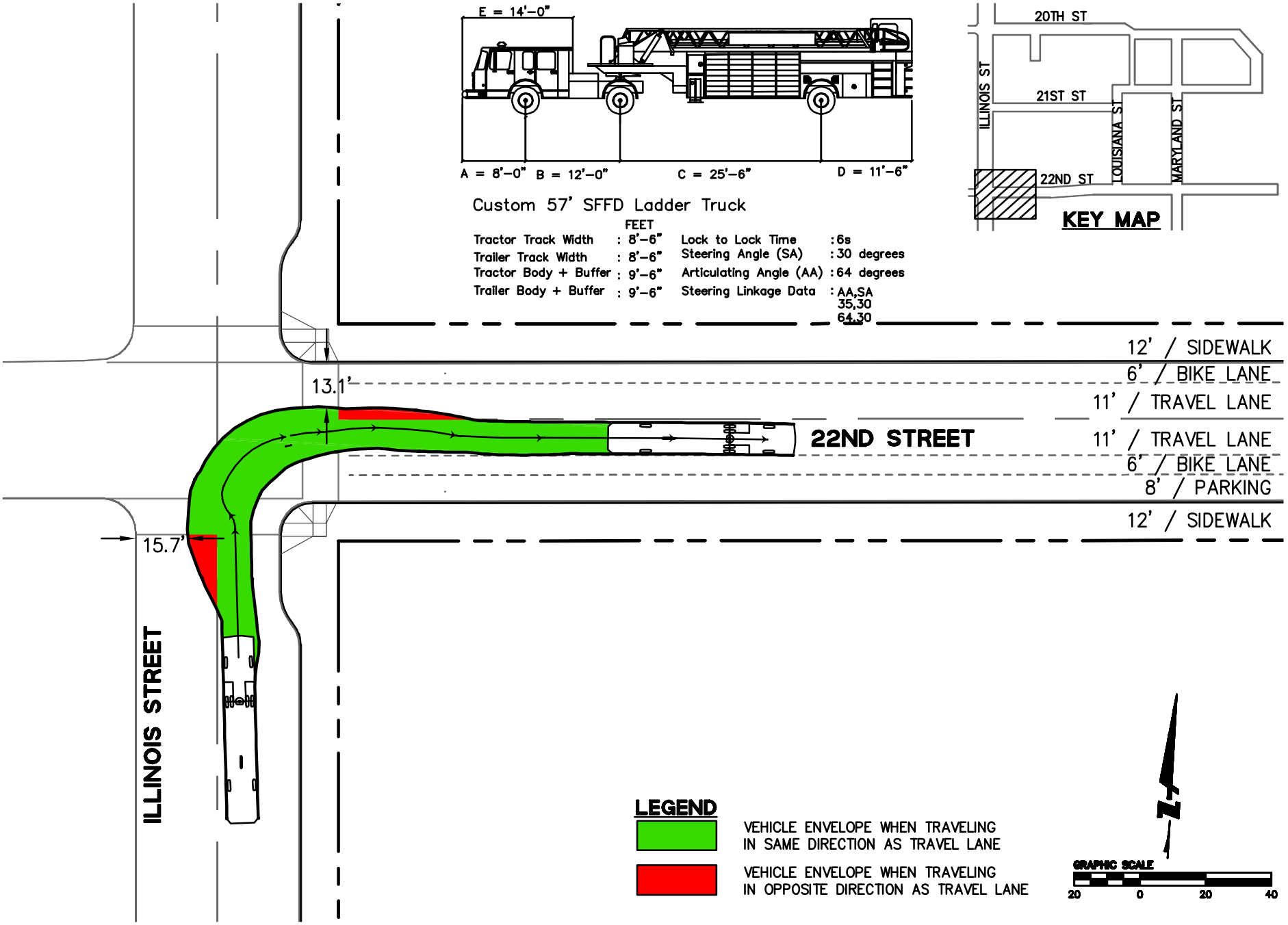
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

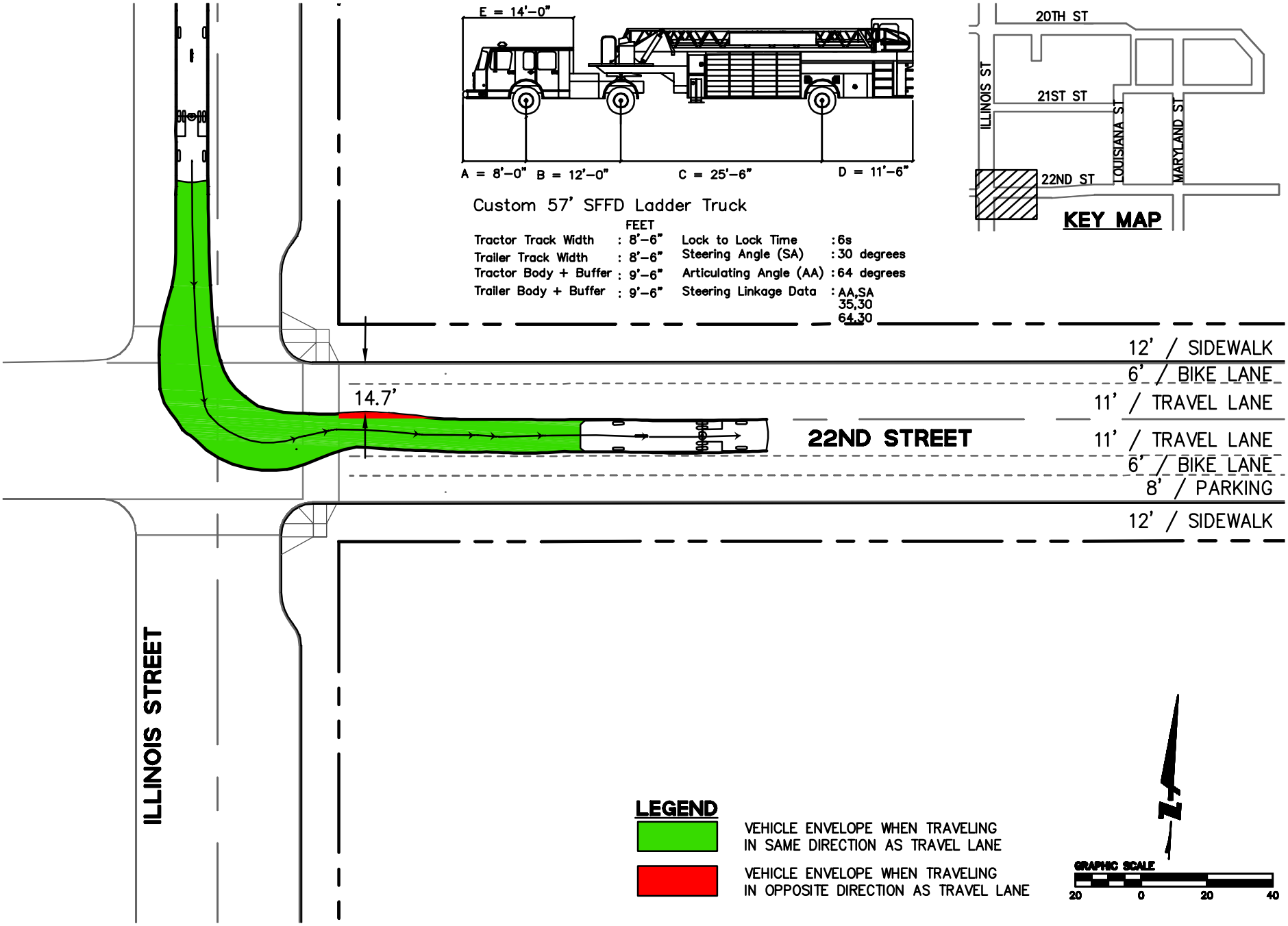
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

FEET

Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



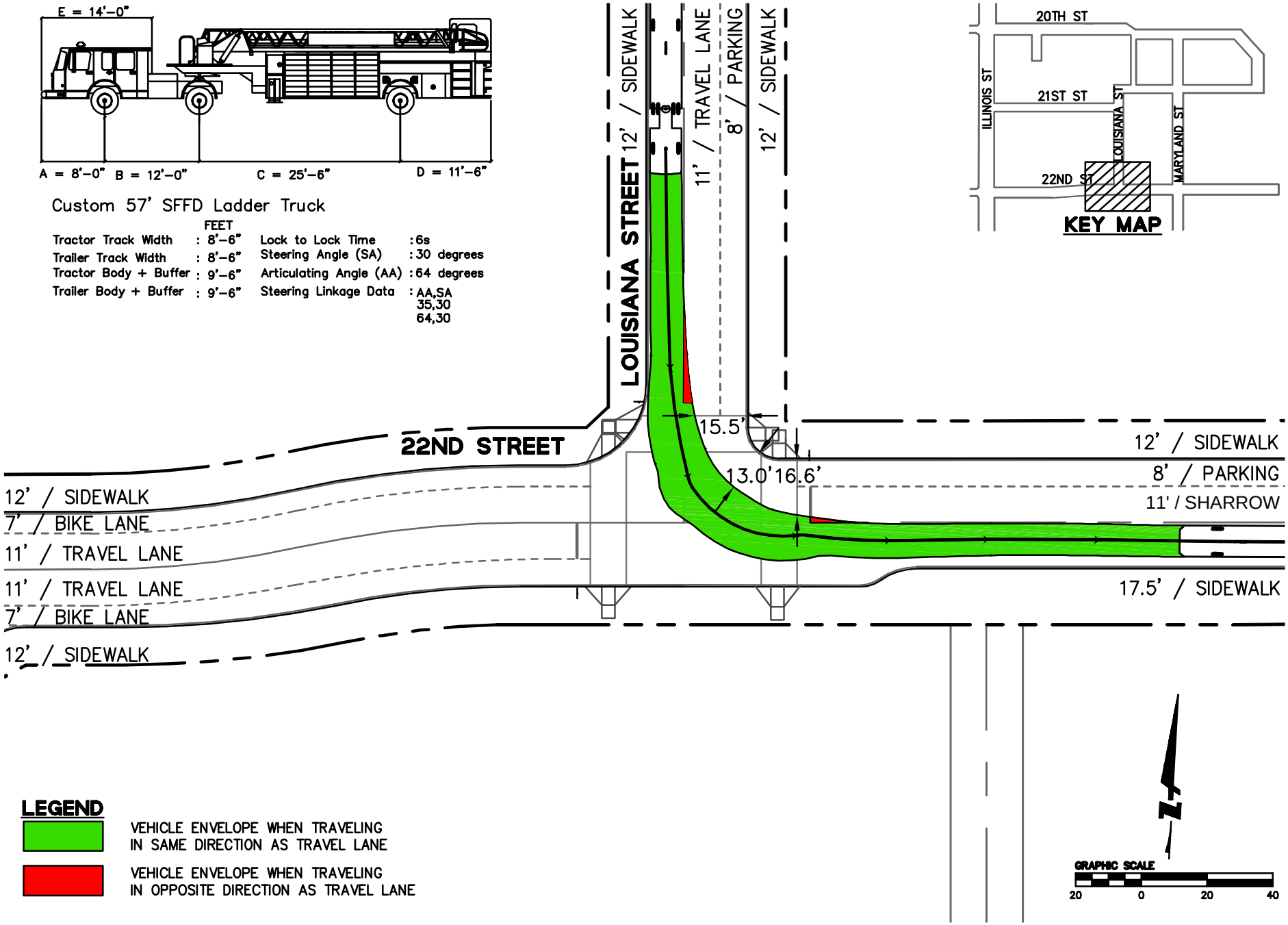
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



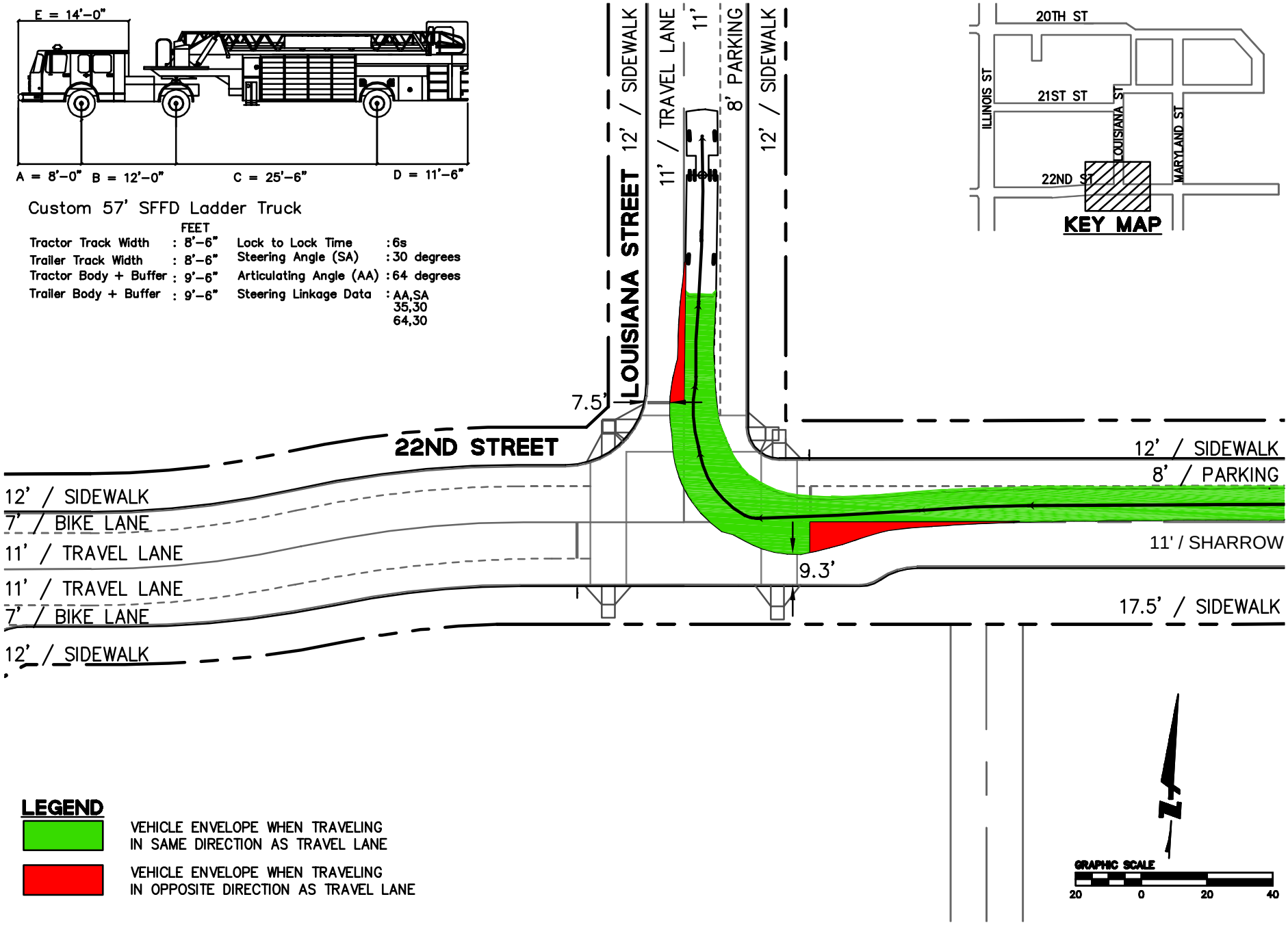
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

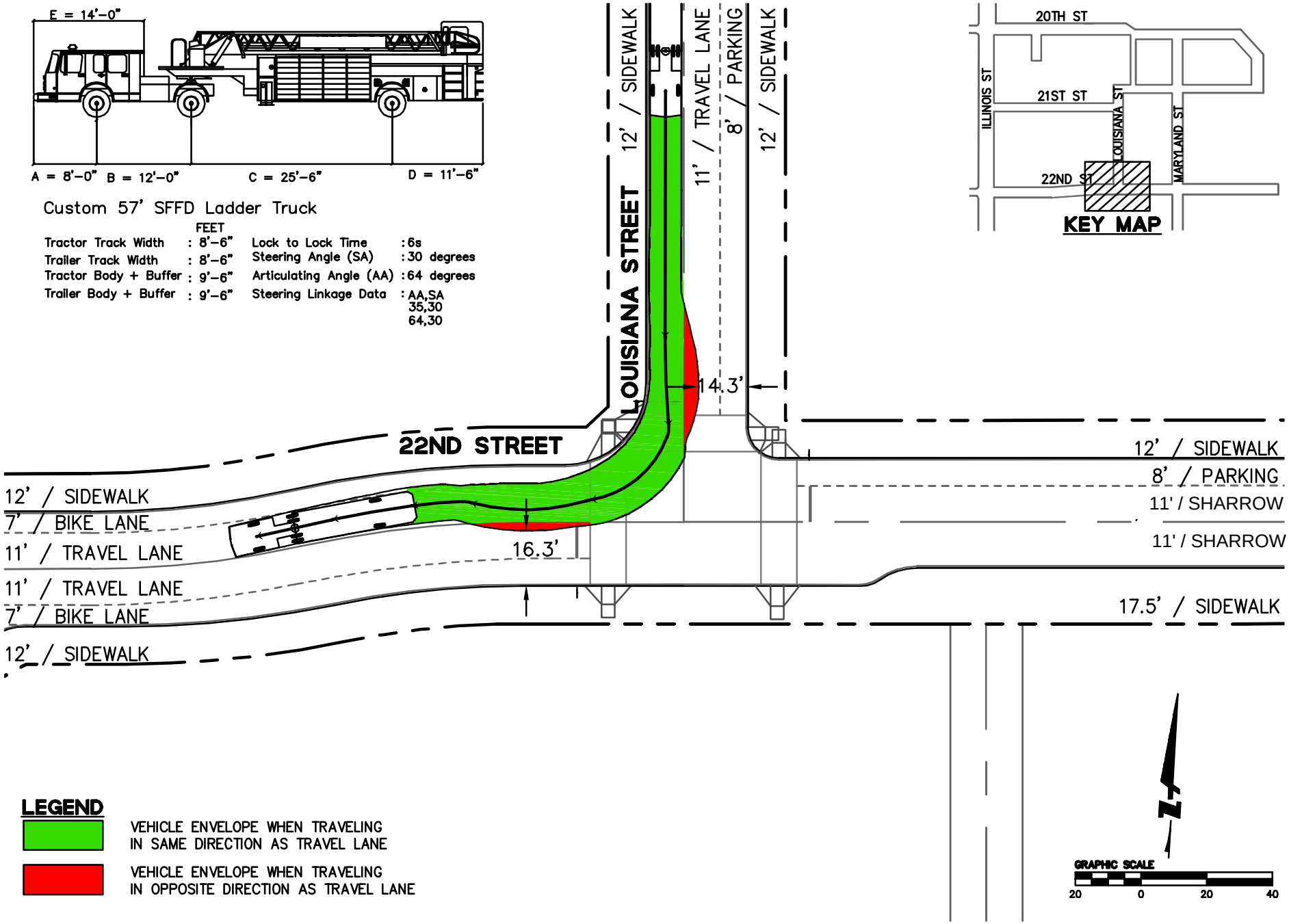
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



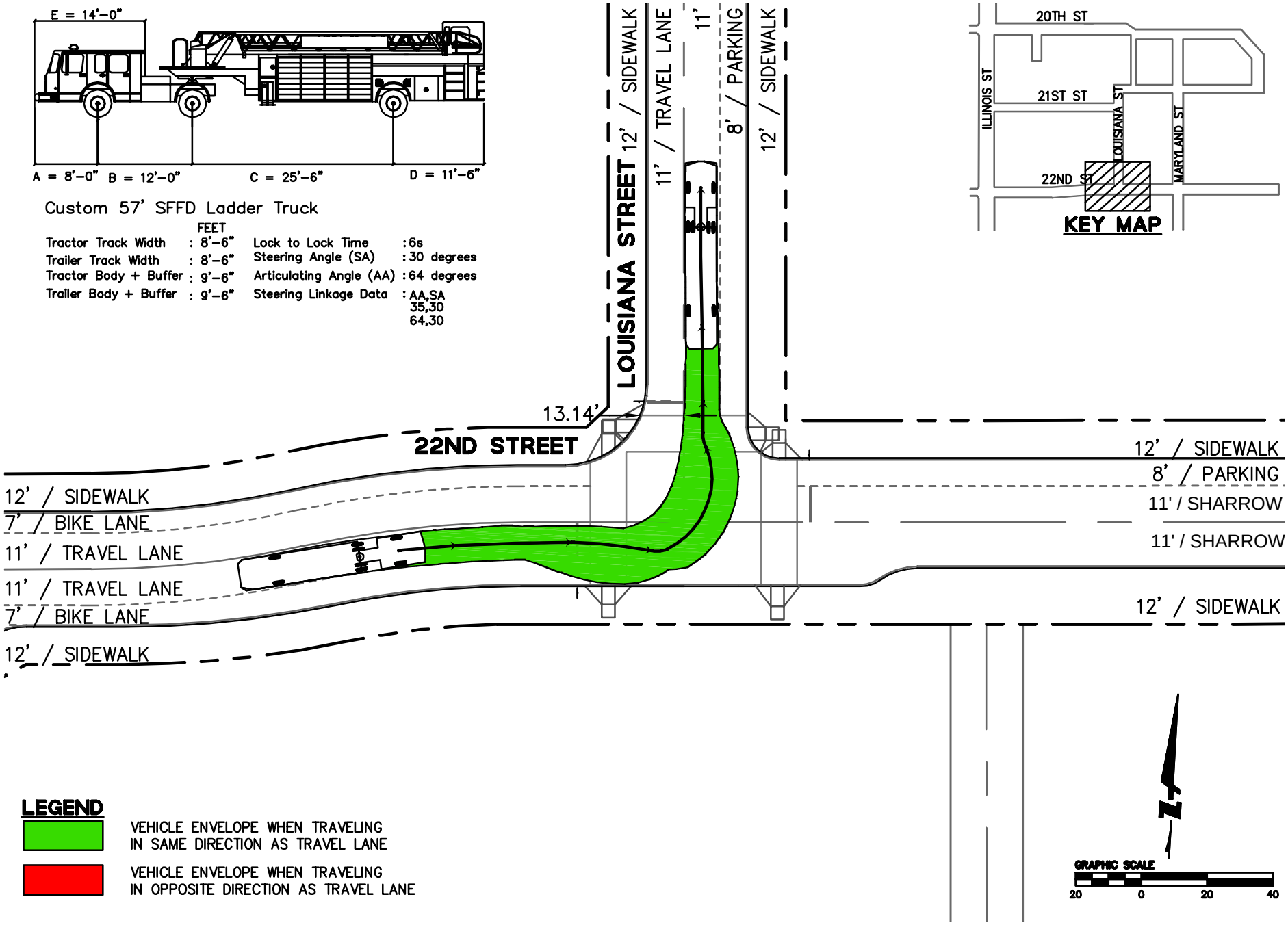
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



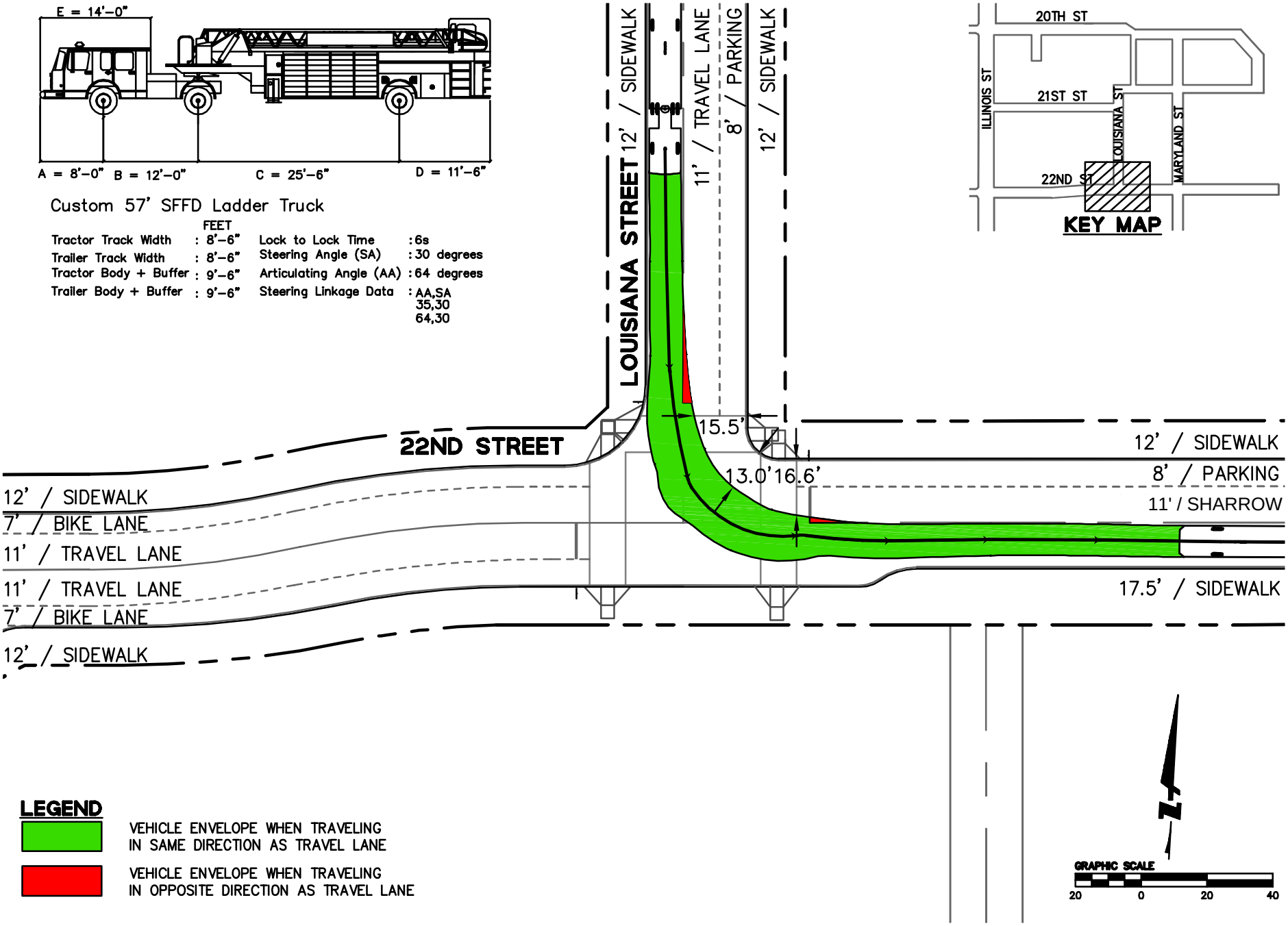
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



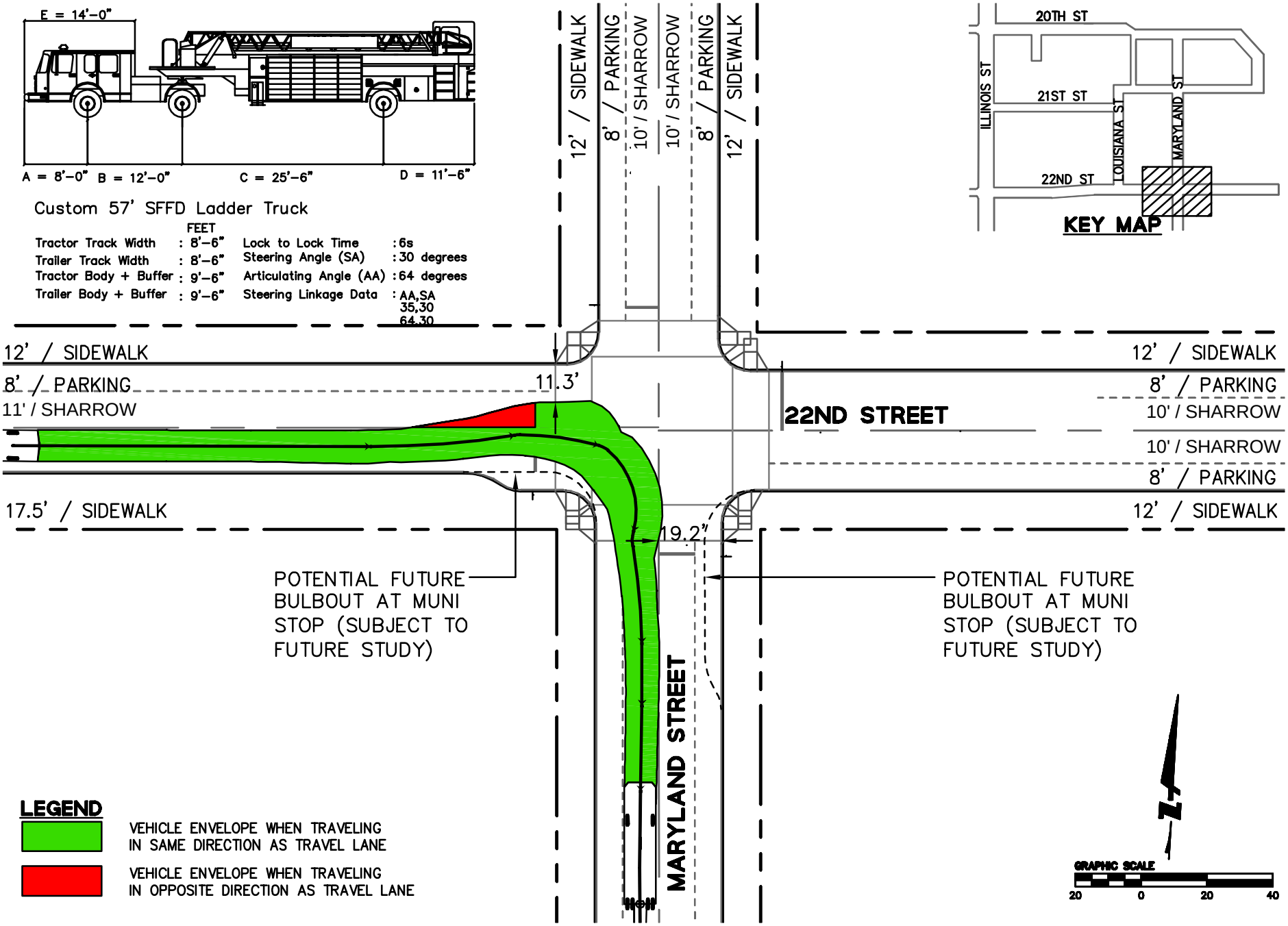
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



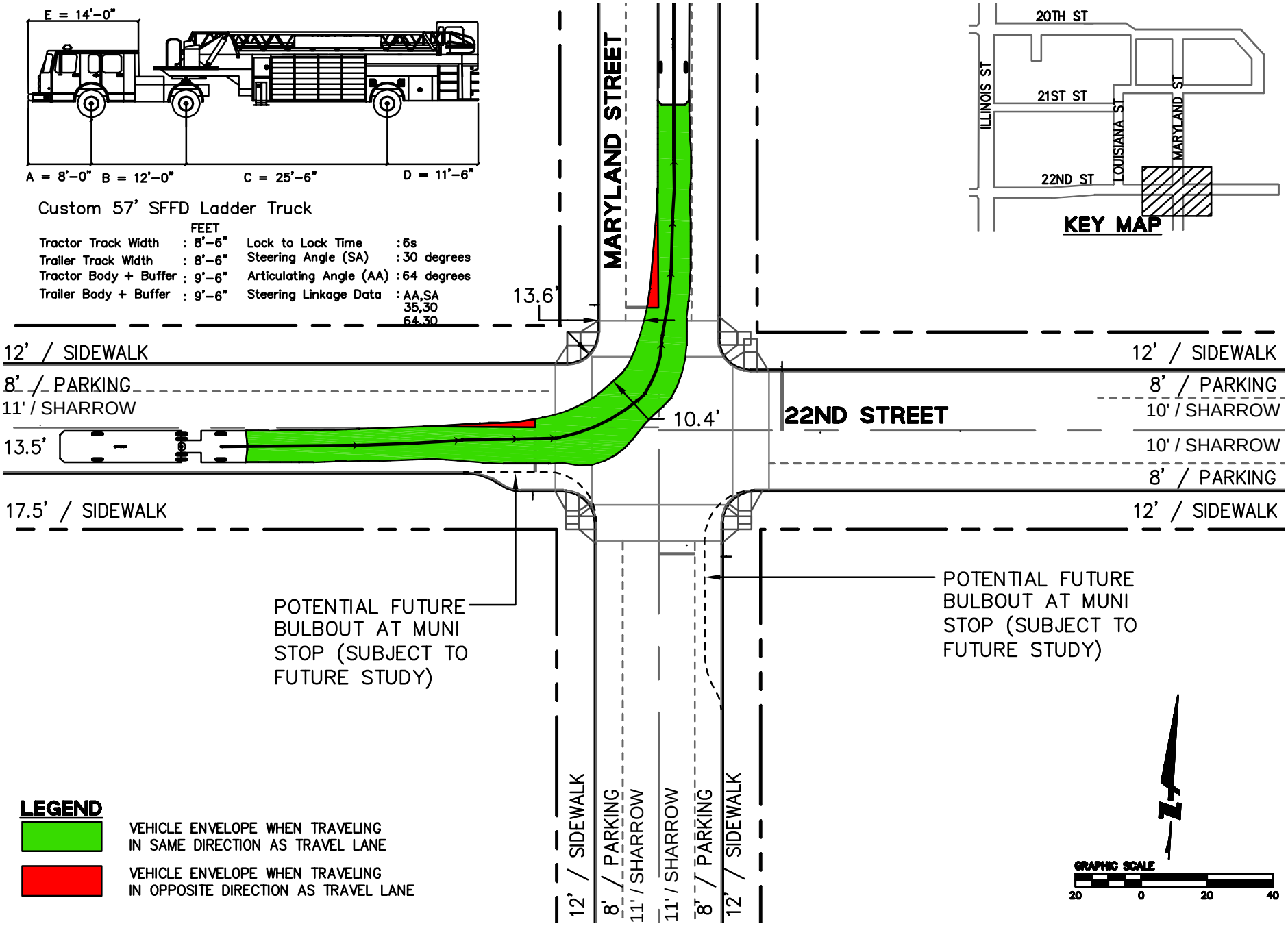
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	8'-6"	Lock to Lock Time	6s
Trailer Track Width	8'-6"	Steering Angle (SA)	30 degrees
Tractor Body + Buffer	9'-6"	Articulating Angle (AA)	64 degrees
Trailer Body + Buffer	9'-6"	Steering Linkage Data	AA,SA 35,30 64,30



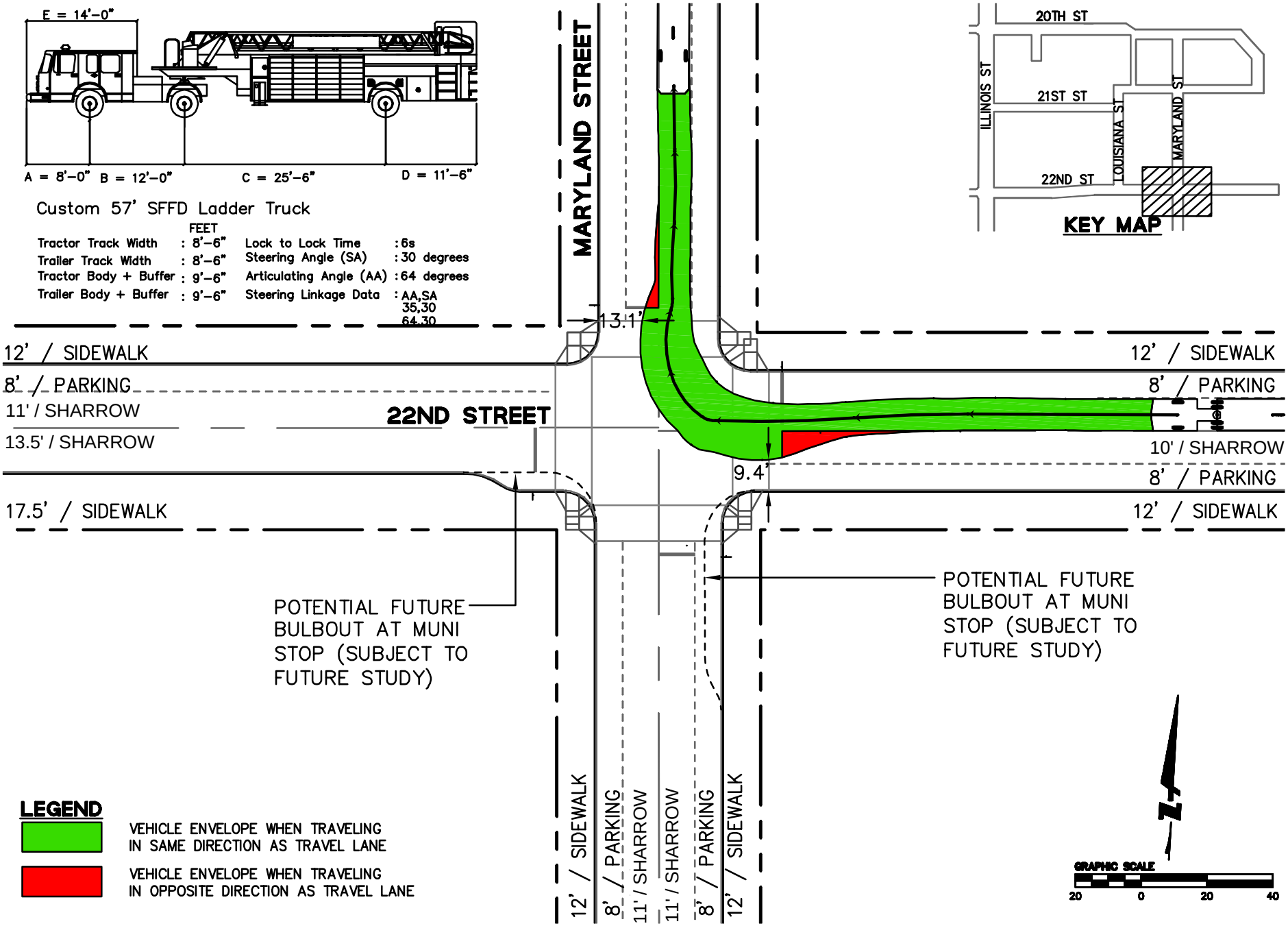
LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

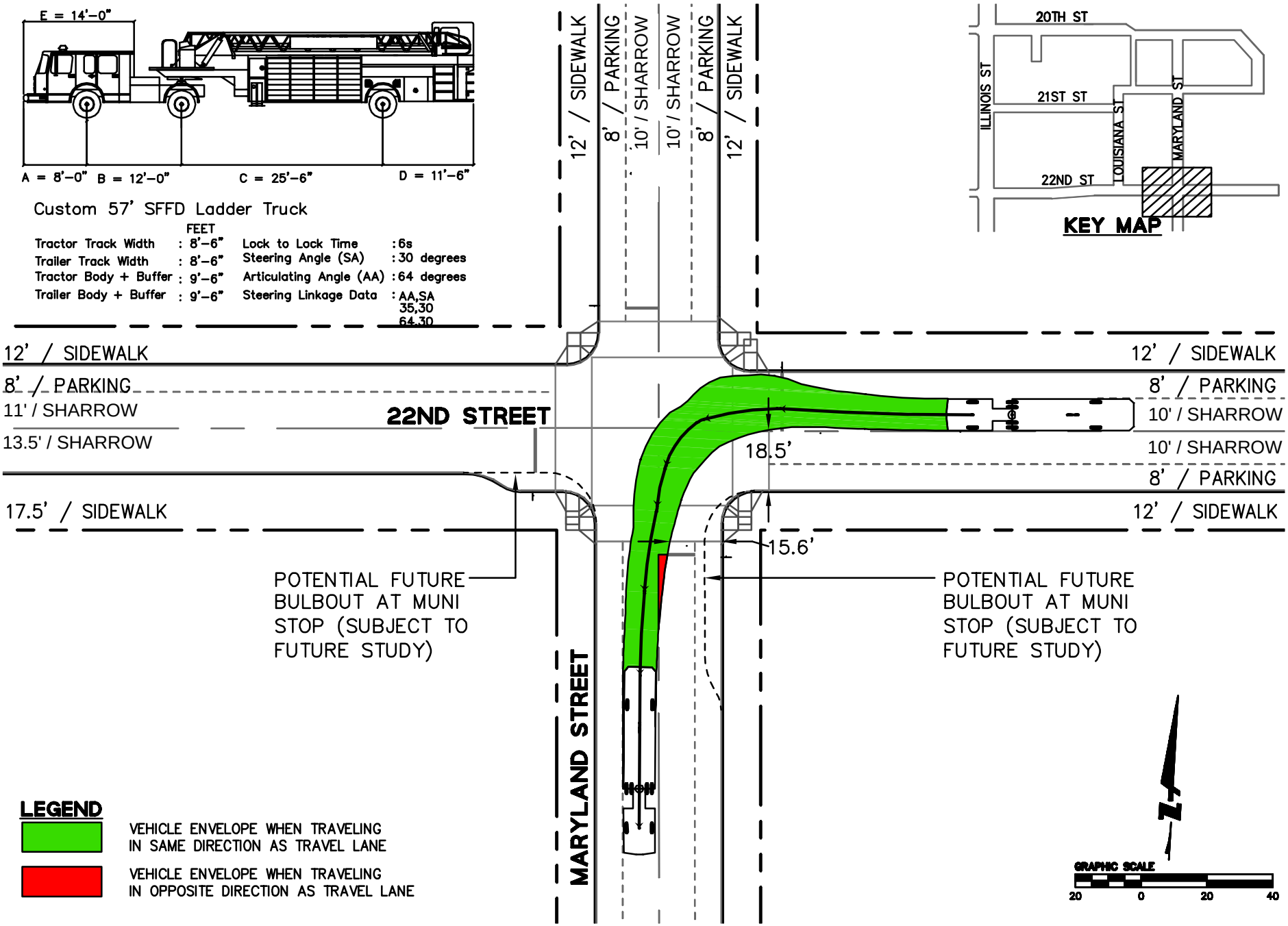
Custom 57' SFFD Ladder Truck

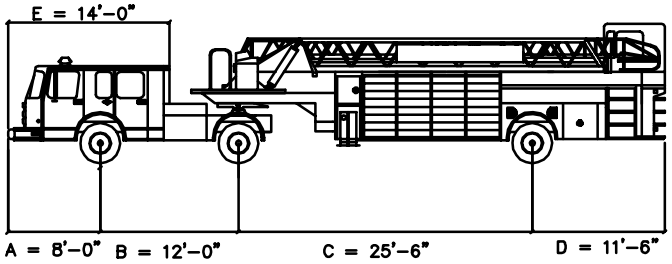
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

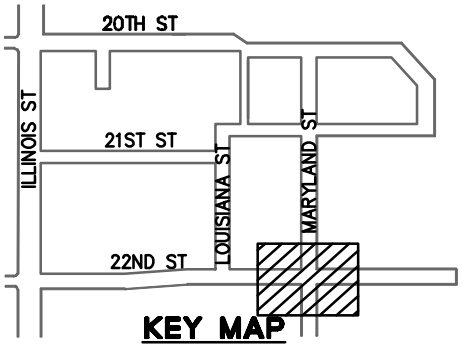
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



MARYLAND STREET

22ND STREET

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK
18.2'
12' / SIDEWALK
8' / PARKING
10' / SHARROW
8' / PARKING
12' / SIDEWALK
10.5'

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

12' / SIDEWALK
8' / PARKING
11' / SHARROW
8' / PARKING
12' / SIDEWALK

LEGEND

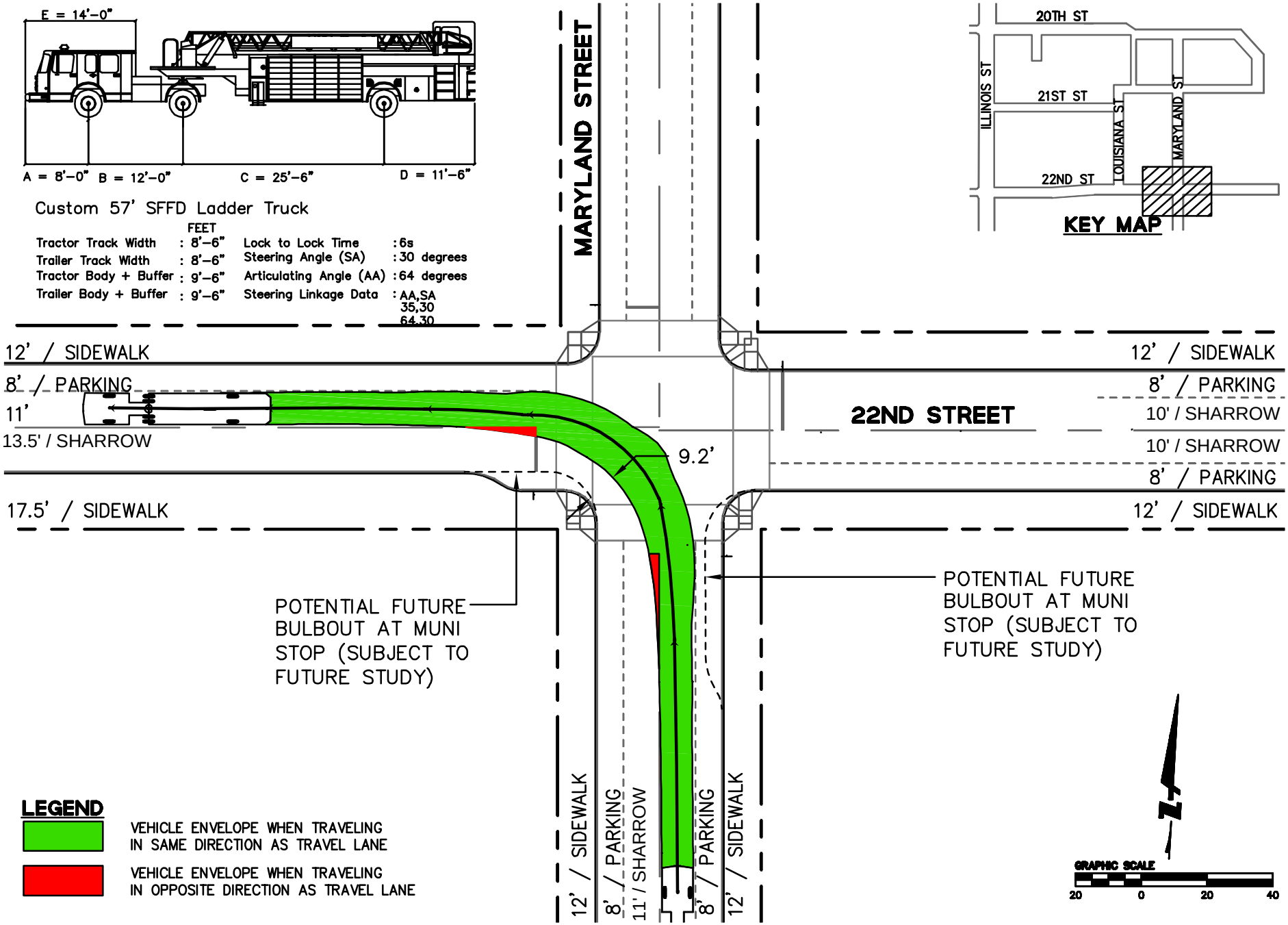
VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

GRAPHIC SCALE
20 0 20 40

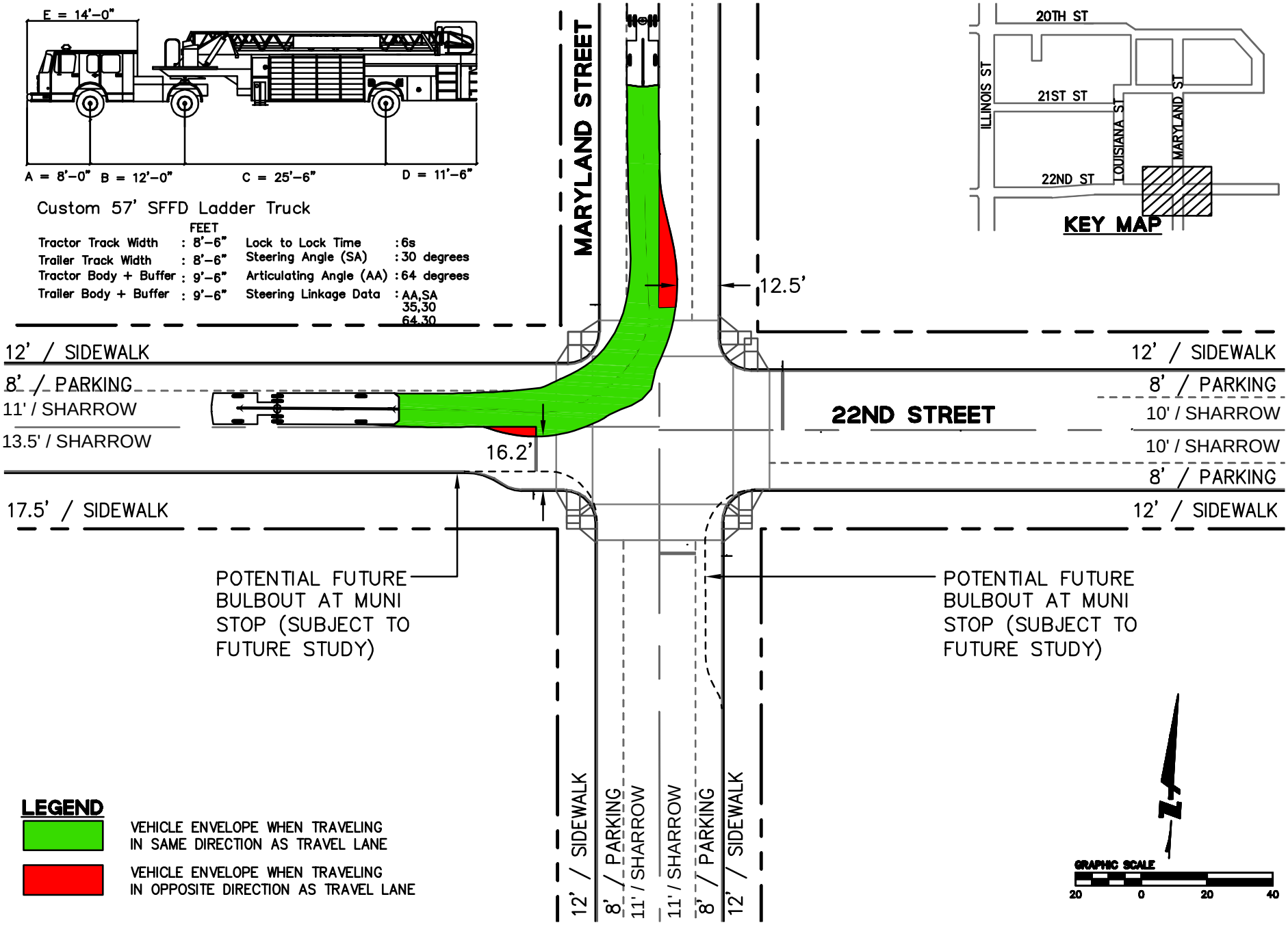
Custom 57' SFFD Ladder Truck

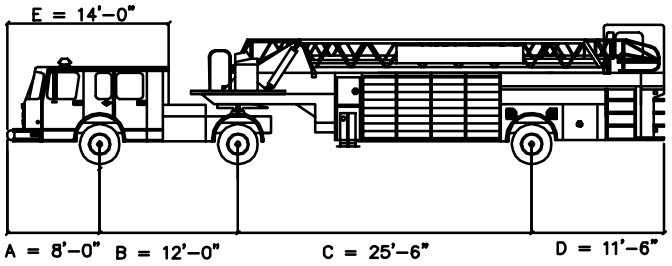
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

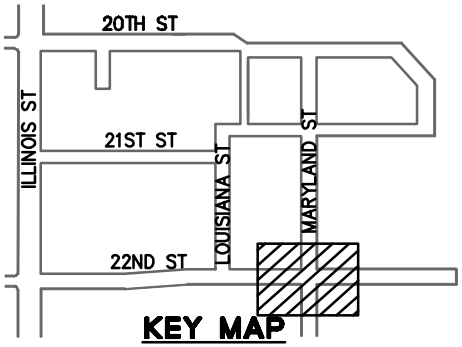
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



MARYLAND STREET

22ND STREET

11.5'

16.0'

12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
13.5' / SIDEWALK

12' / SIDEWALK
8' / PARKING
10' / SHARROW
8' / PARKING
12' / SIDEWALK

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

POTENTIAL FUTURE BULBOUT AT MUNI STOP (SUBJECT TO FUTURE STUDY)

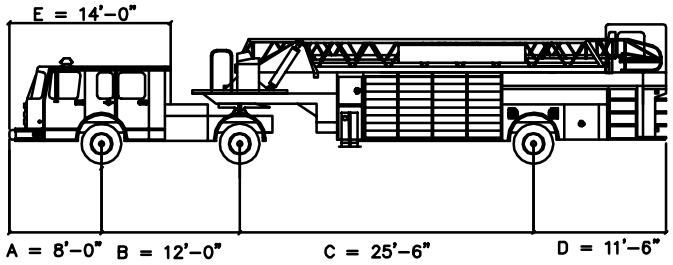
12' / SIDEWALK
8' / PARKING
11' / SHARROW
11' / SHARROW
8' / PARKING
12' / SIDEWALK

LEGEND

VEHICLE ENVELOPE WHEN TRAVELING IN SAME DIRECTION AS TRAVEL LANE

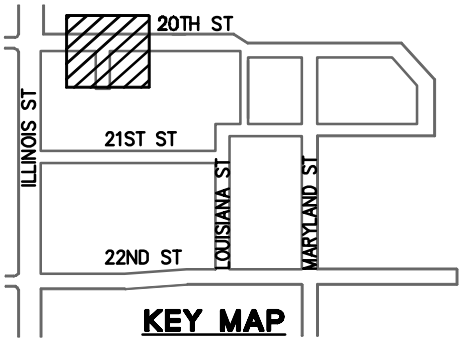
VEHICLE ENVELOPE WHEN TRAVELING IN OPPOSITE DIRECTION AS TRAVEL LANE

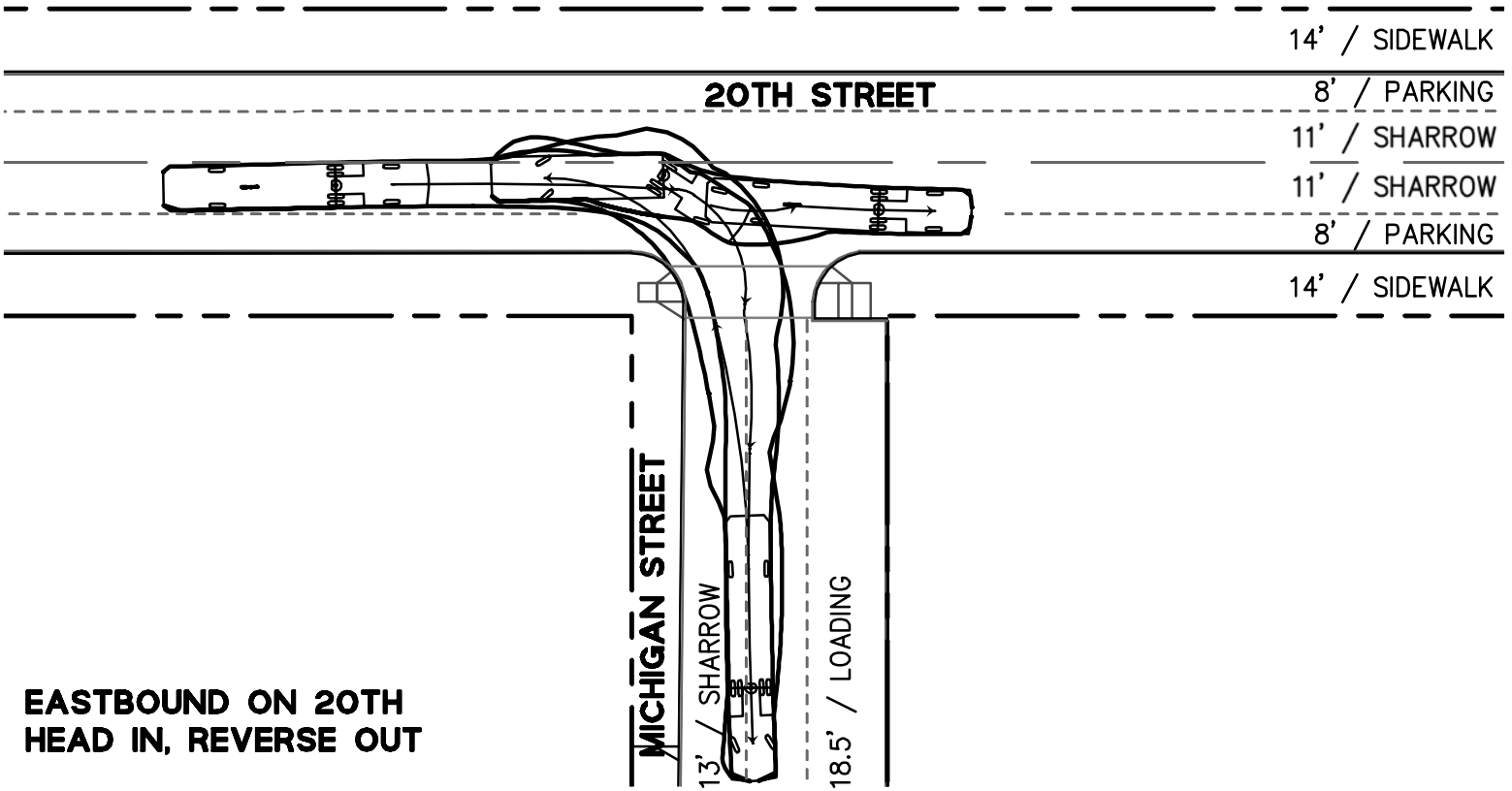
GRAPHIC SCALE
20 0 20 40



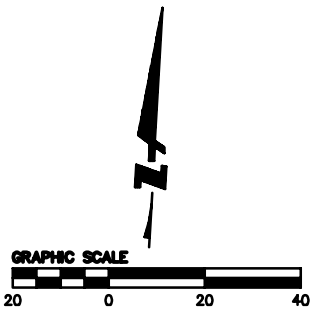
Custom 57' SFFD Ladder Truck

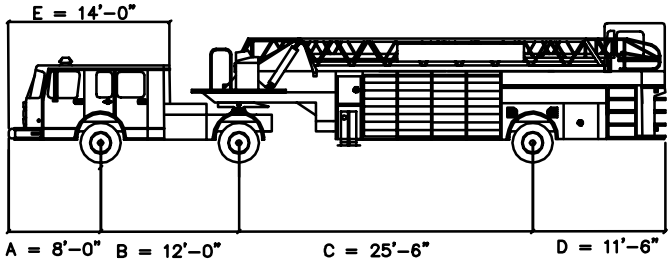
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





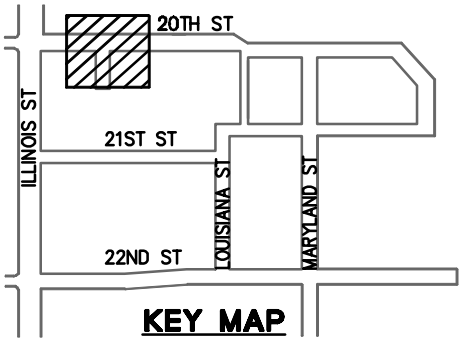
EASTBOUND ON 20TH
HEAD IN, REVERSE OUT

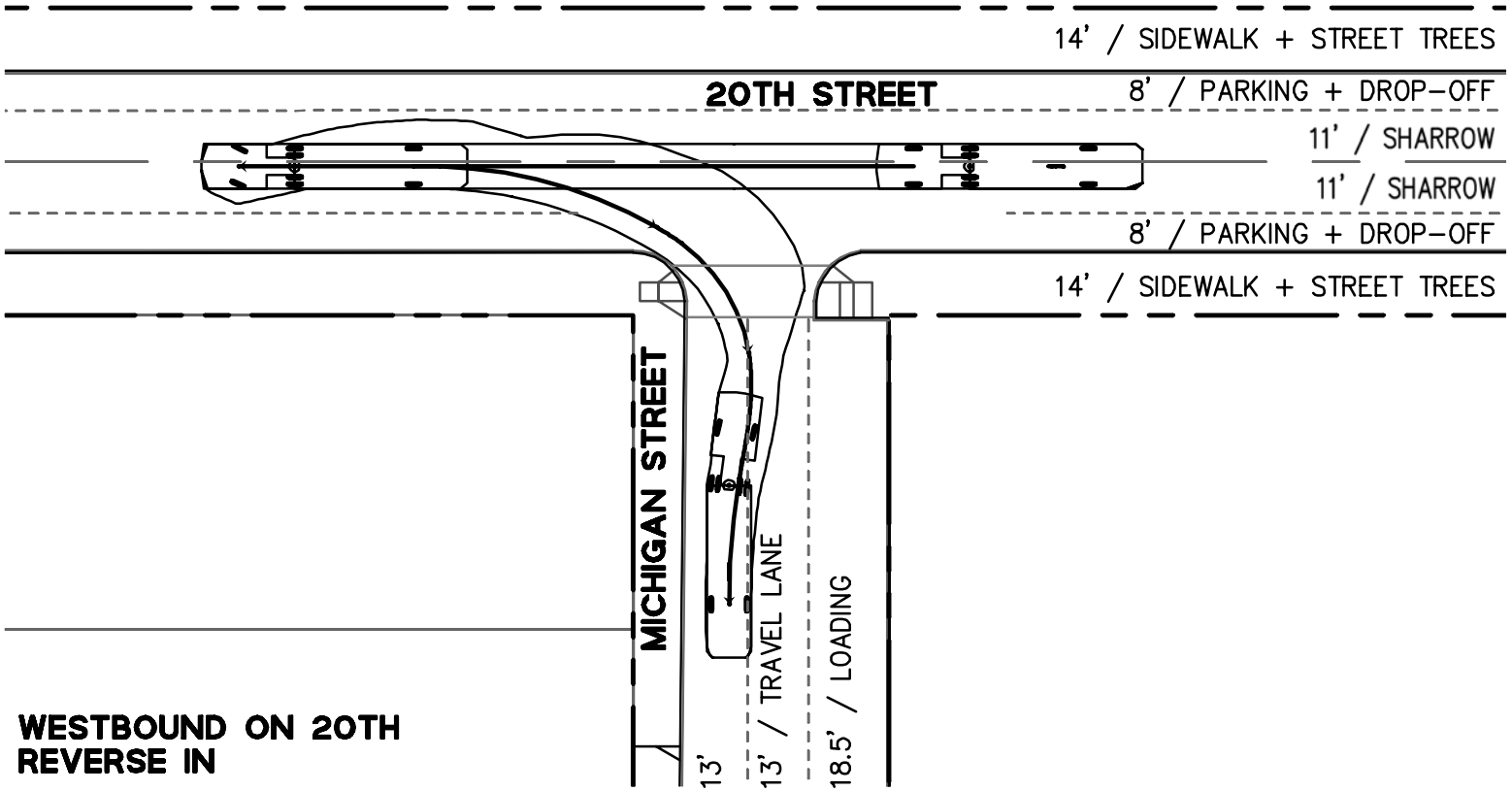




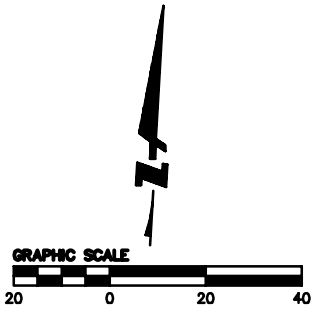
Custom 57' SFFD Ladder Truck

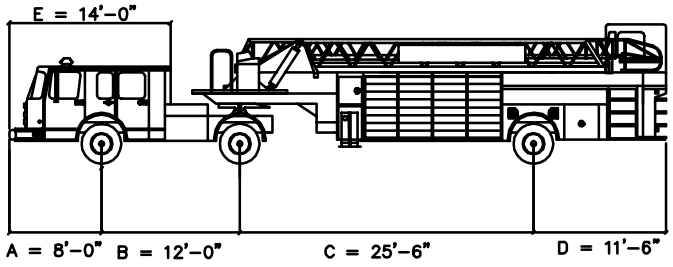
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





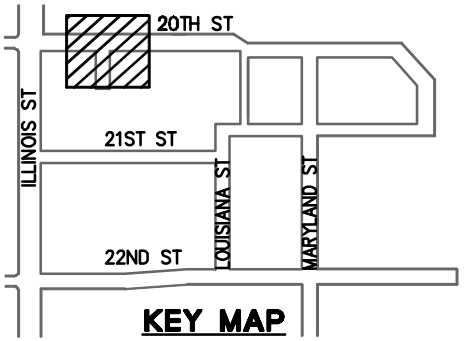
WESTBOUND ON 20TH
REVERSE IN

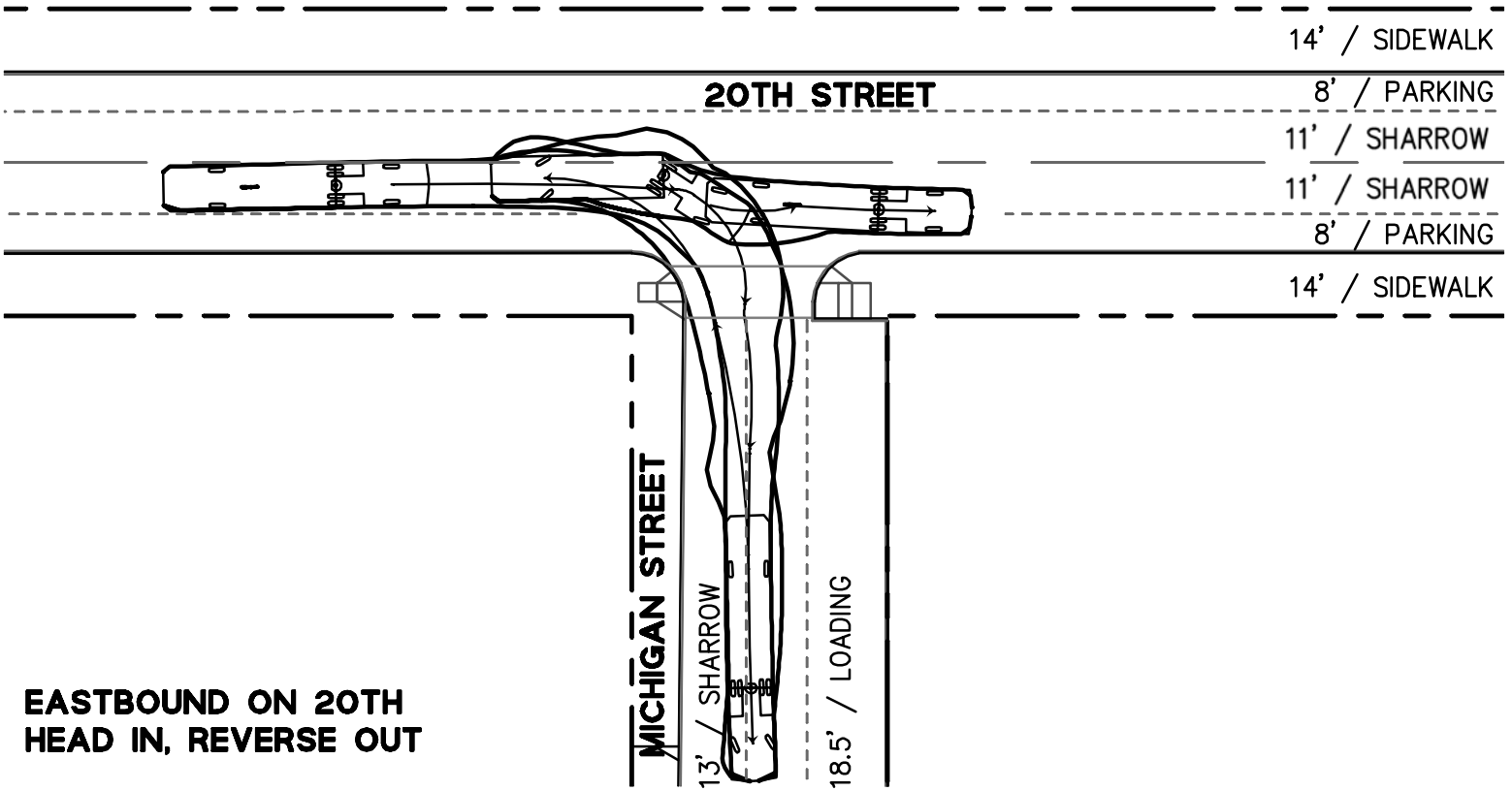




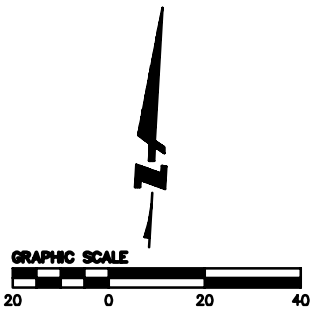
Custom 57' SFFD Ladder Truck

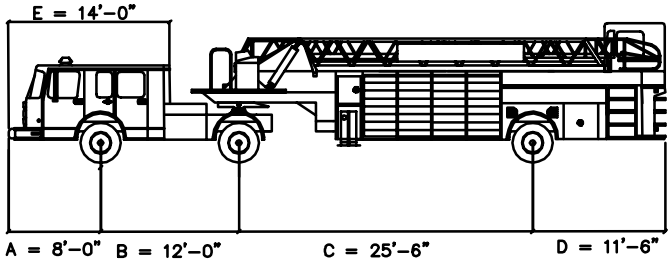
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





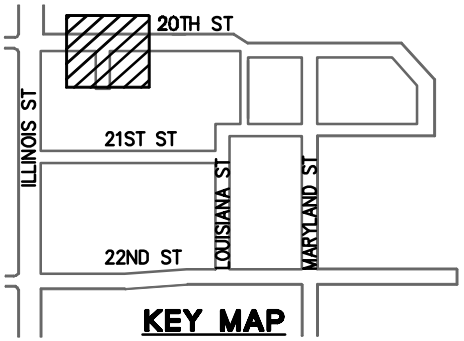
EASTBOUND ON 20TH
HEAD IN, REVERSE OUT

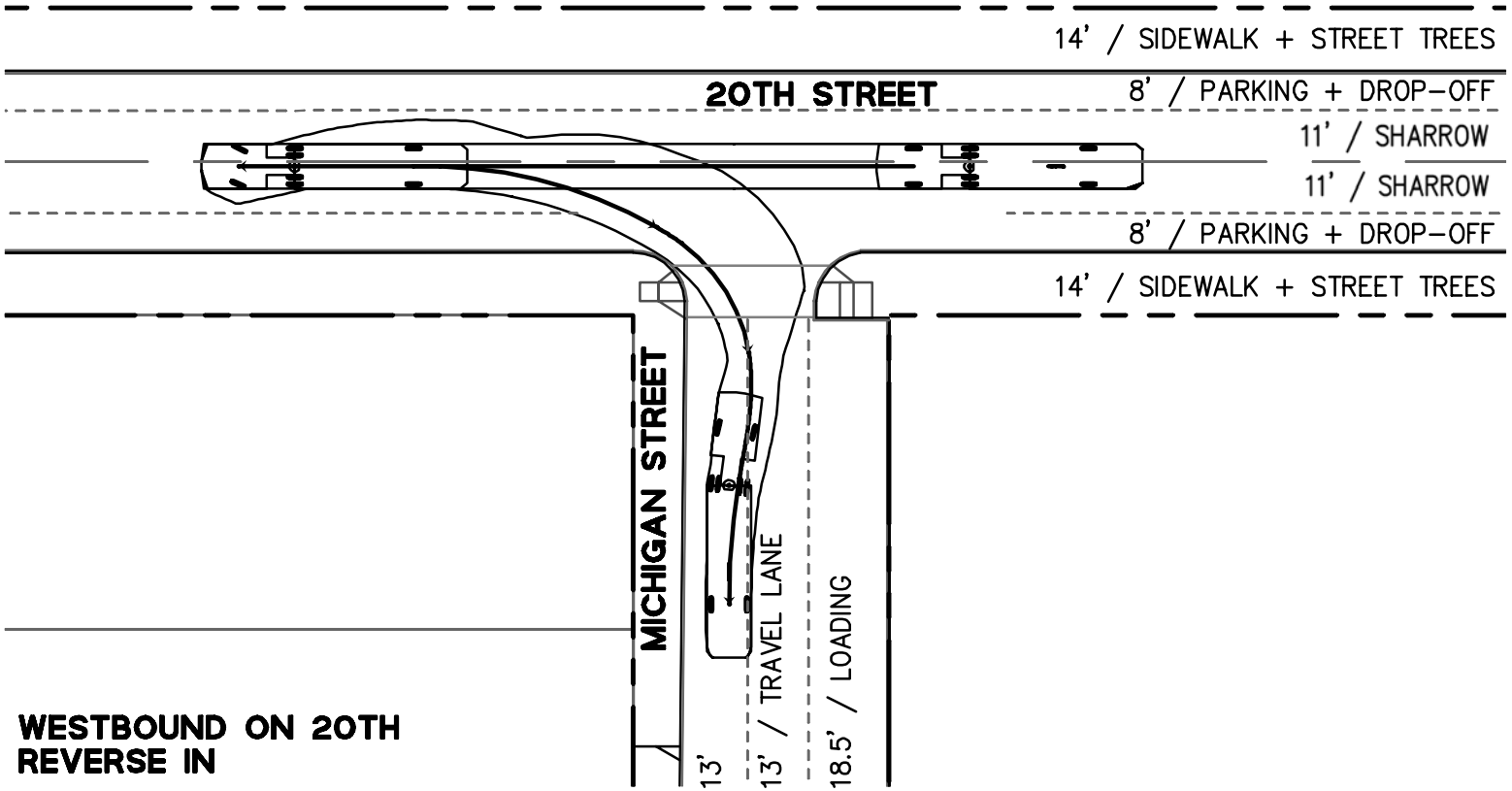




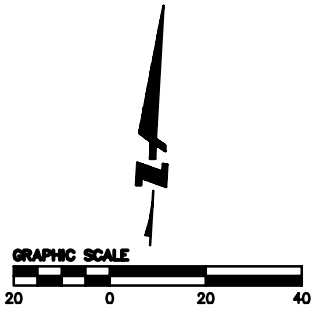
Custom 57' SFFD Ladder Truck

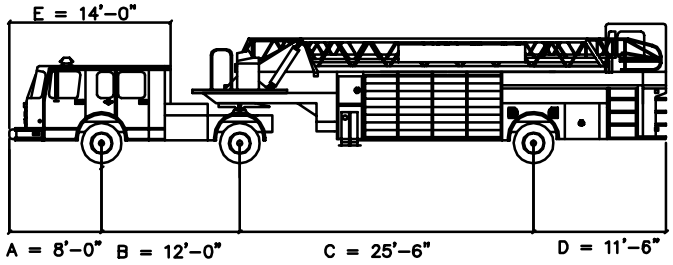
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





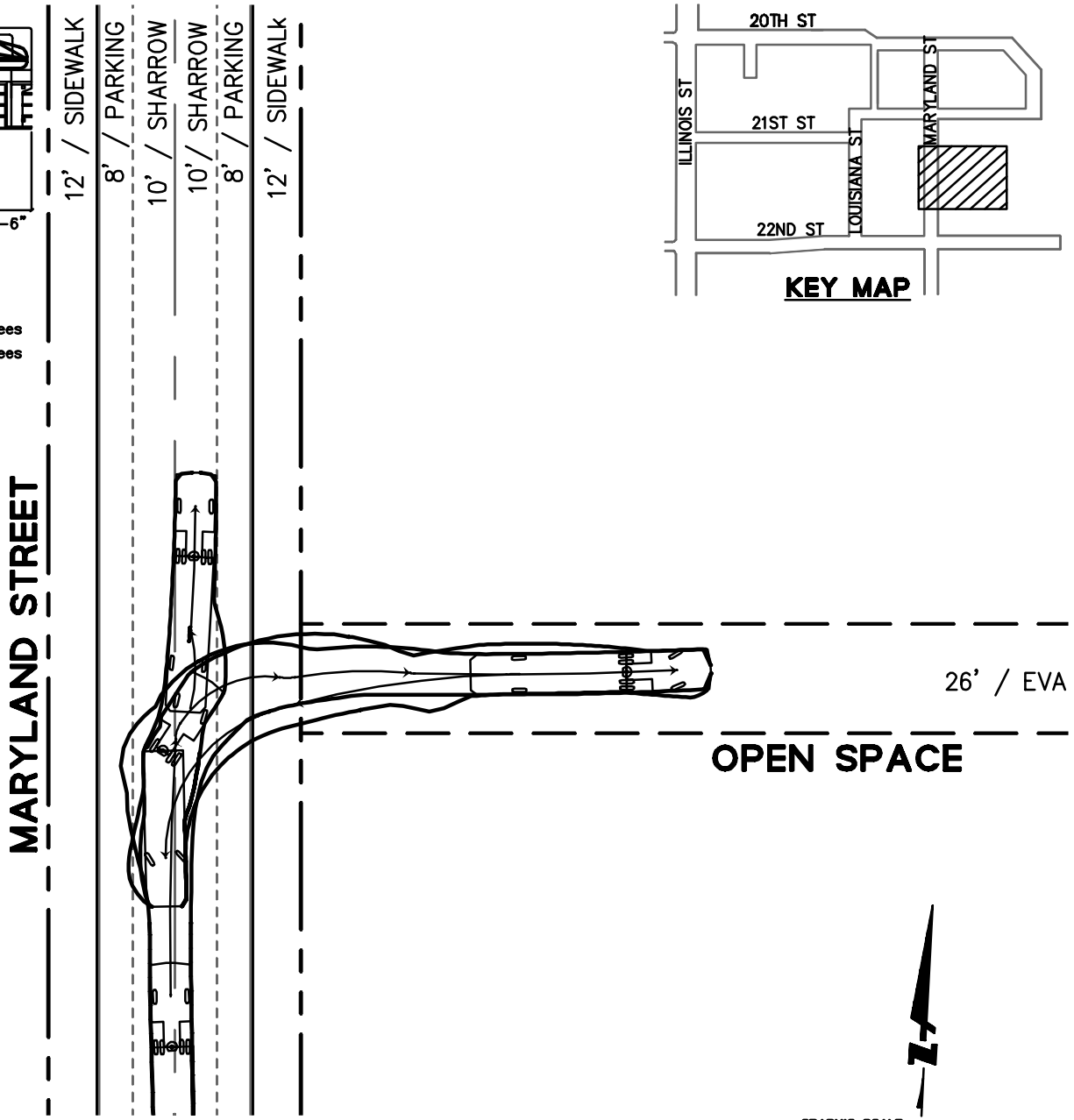
WESTBOUND ON 20TH
REVERSE IN



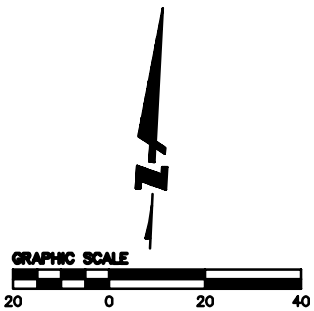


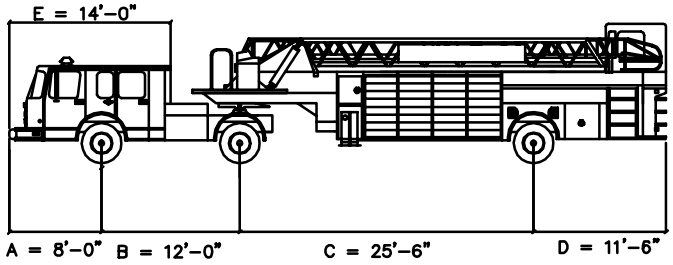
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



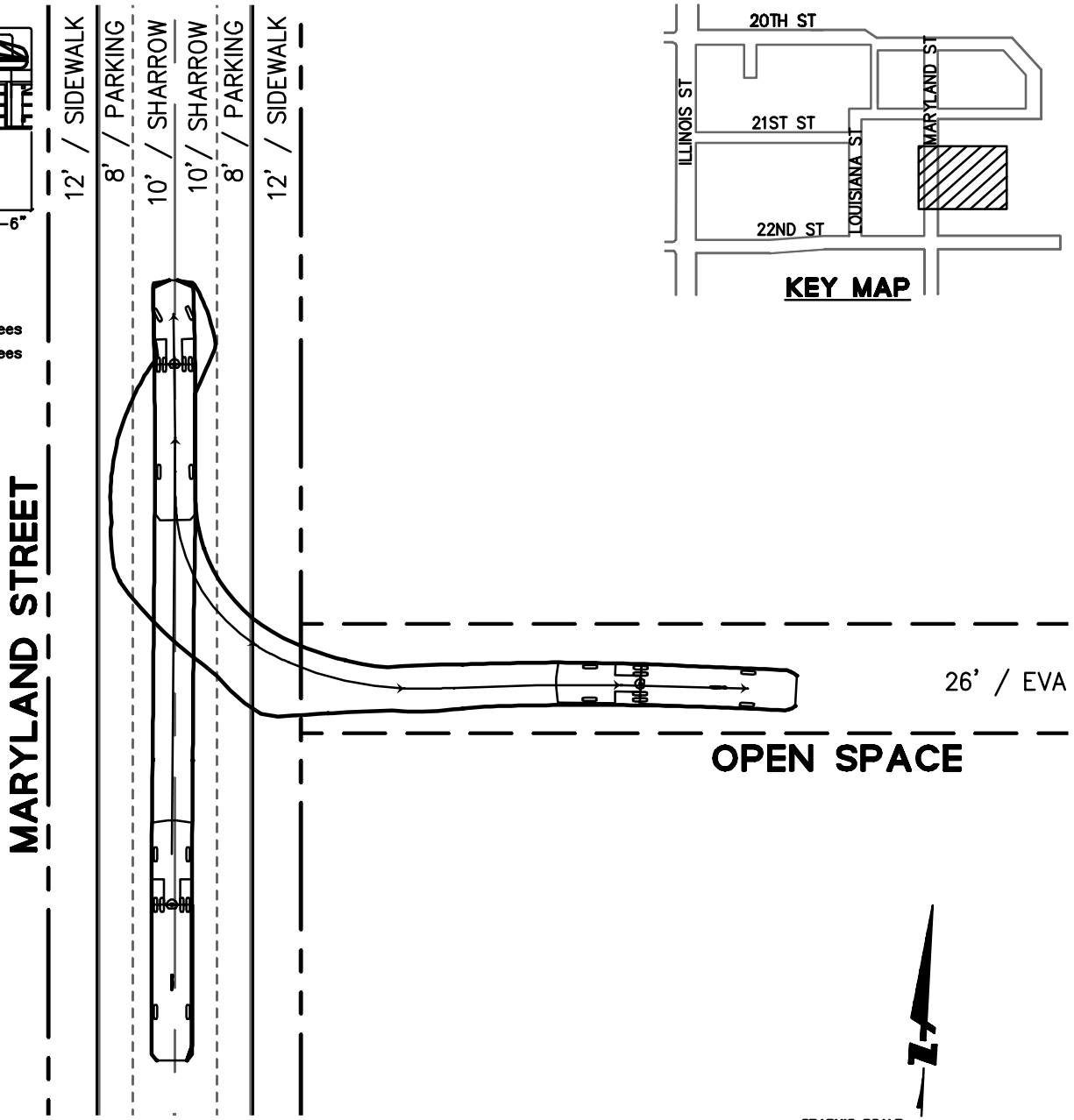
NORTHBOUND ON MARYLAND
RIGHT TURN IN, REVERSE OUT



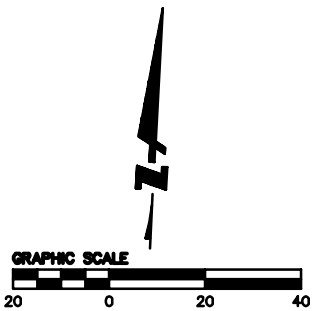


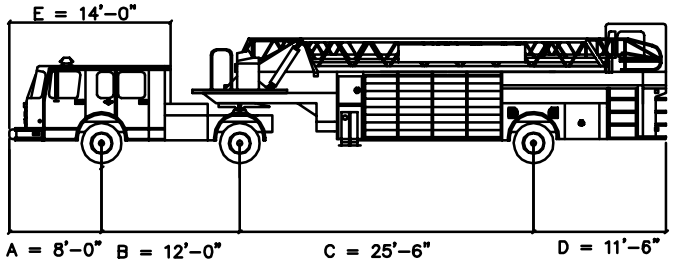
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



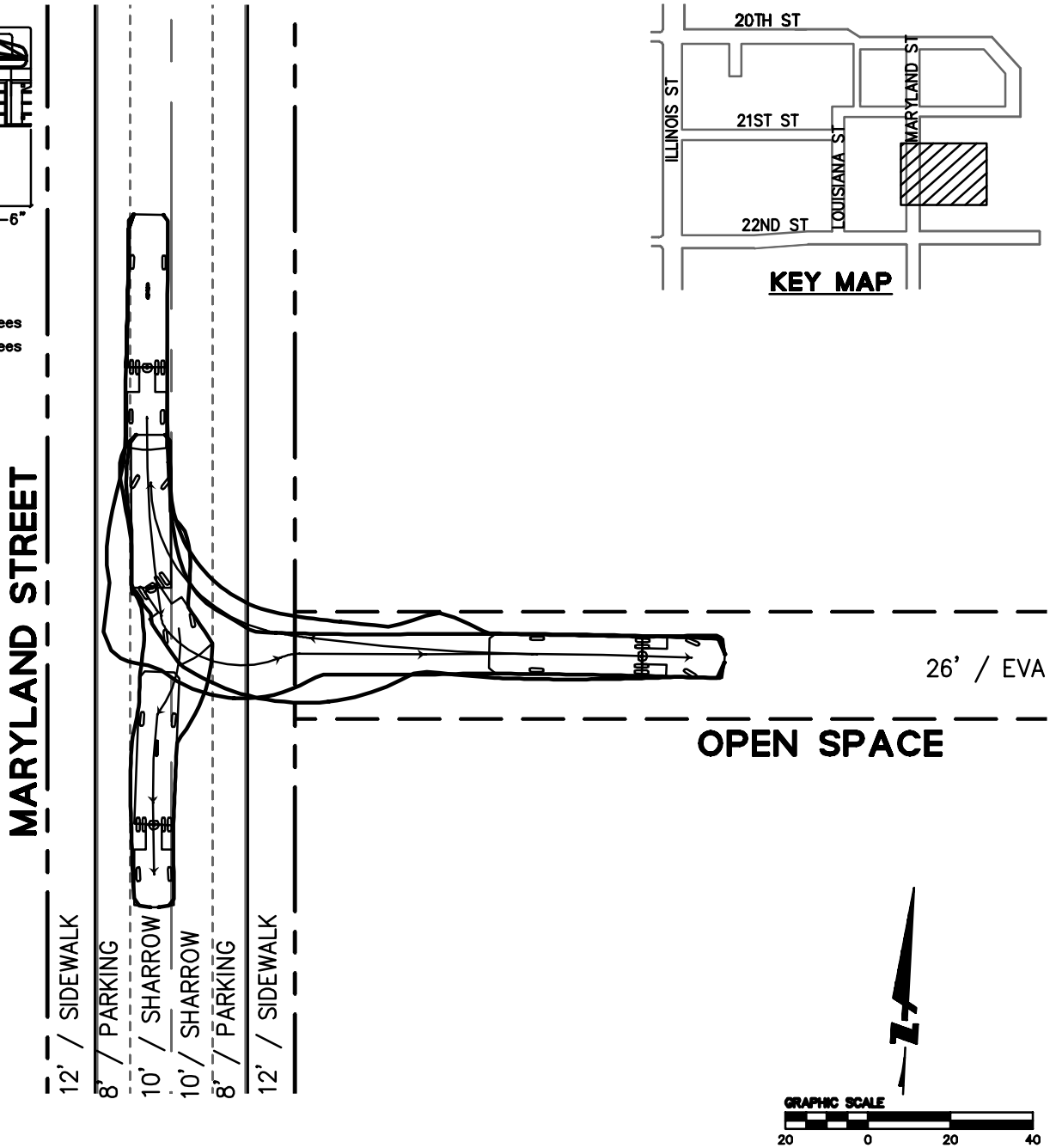
NORTHBOUND ON MARYLAND
REVERSE IN



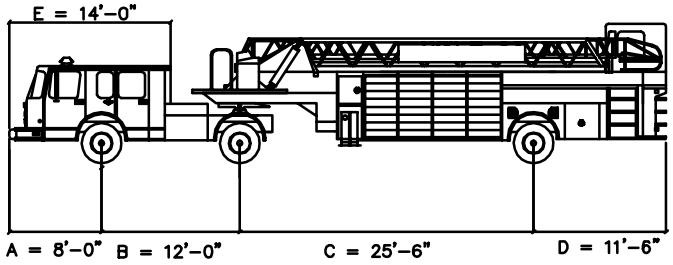


Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

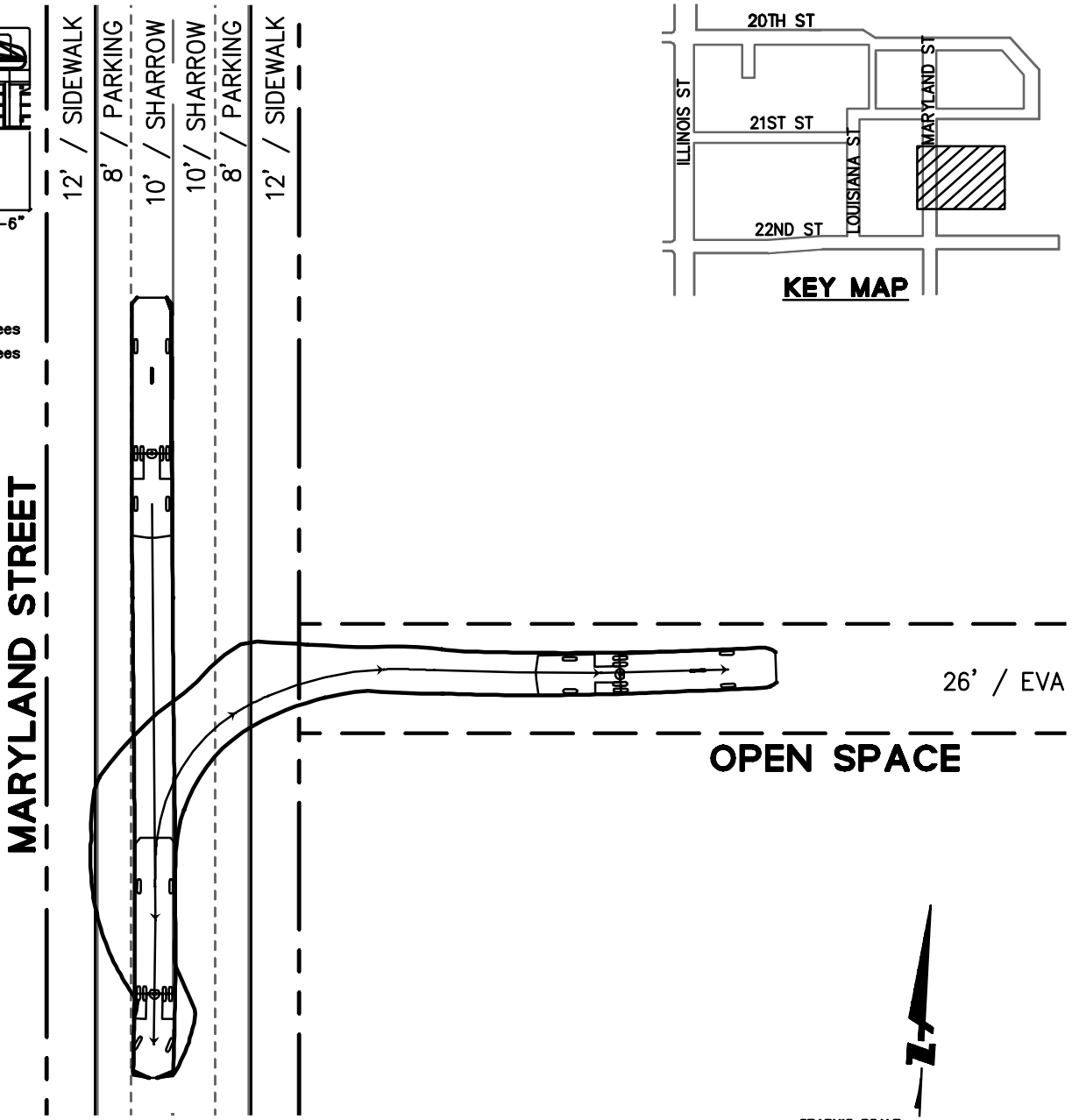


SOUTHBOUND ON MARYLAND
LEFT TURN IN, REVERSE OUT

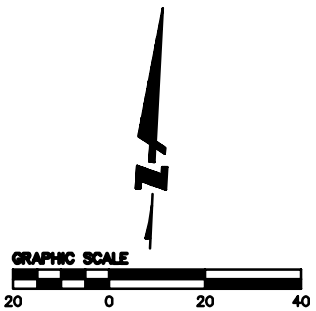


Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

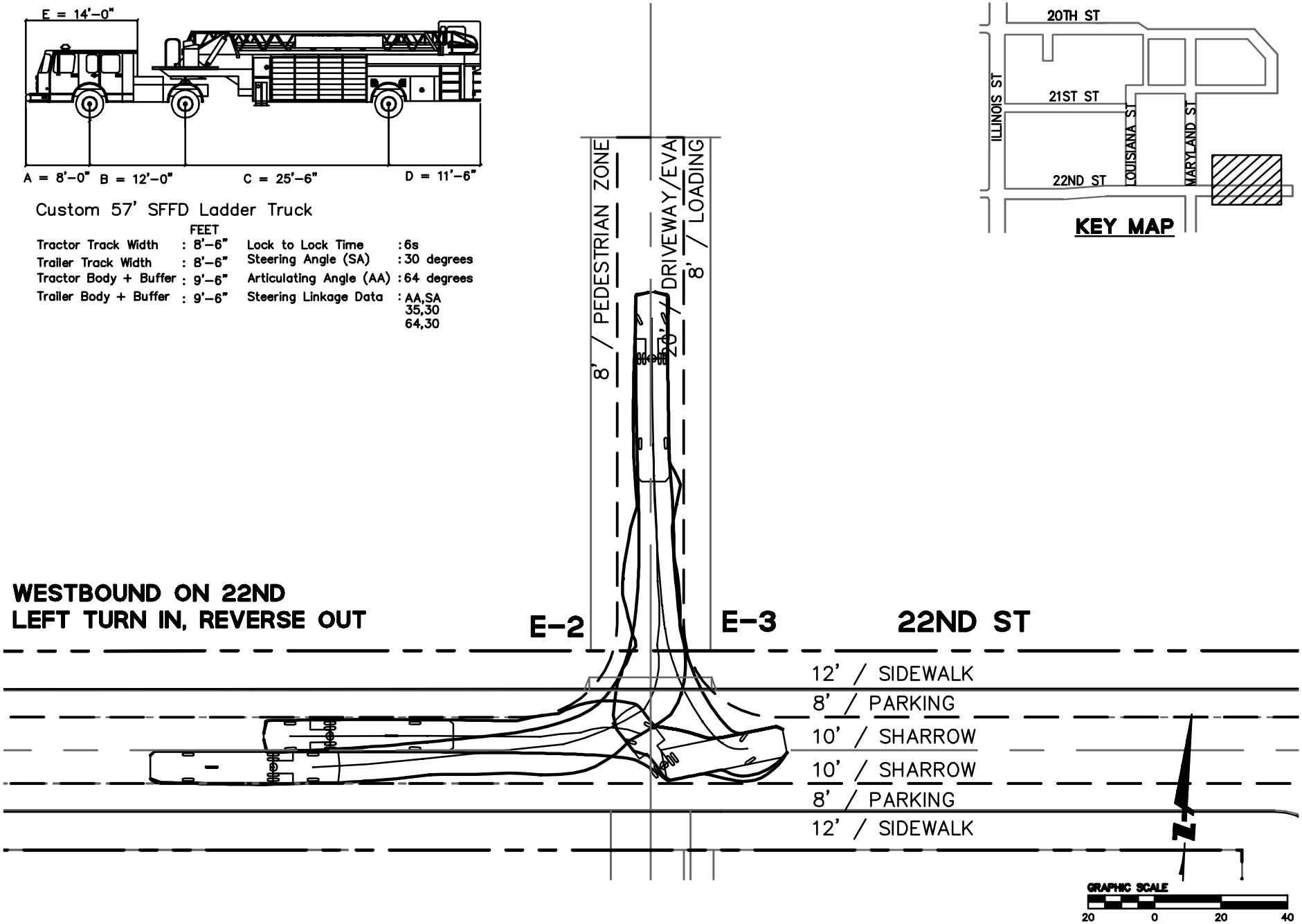


SOUTHBOUND ON MARYLAND
REVERSE IN



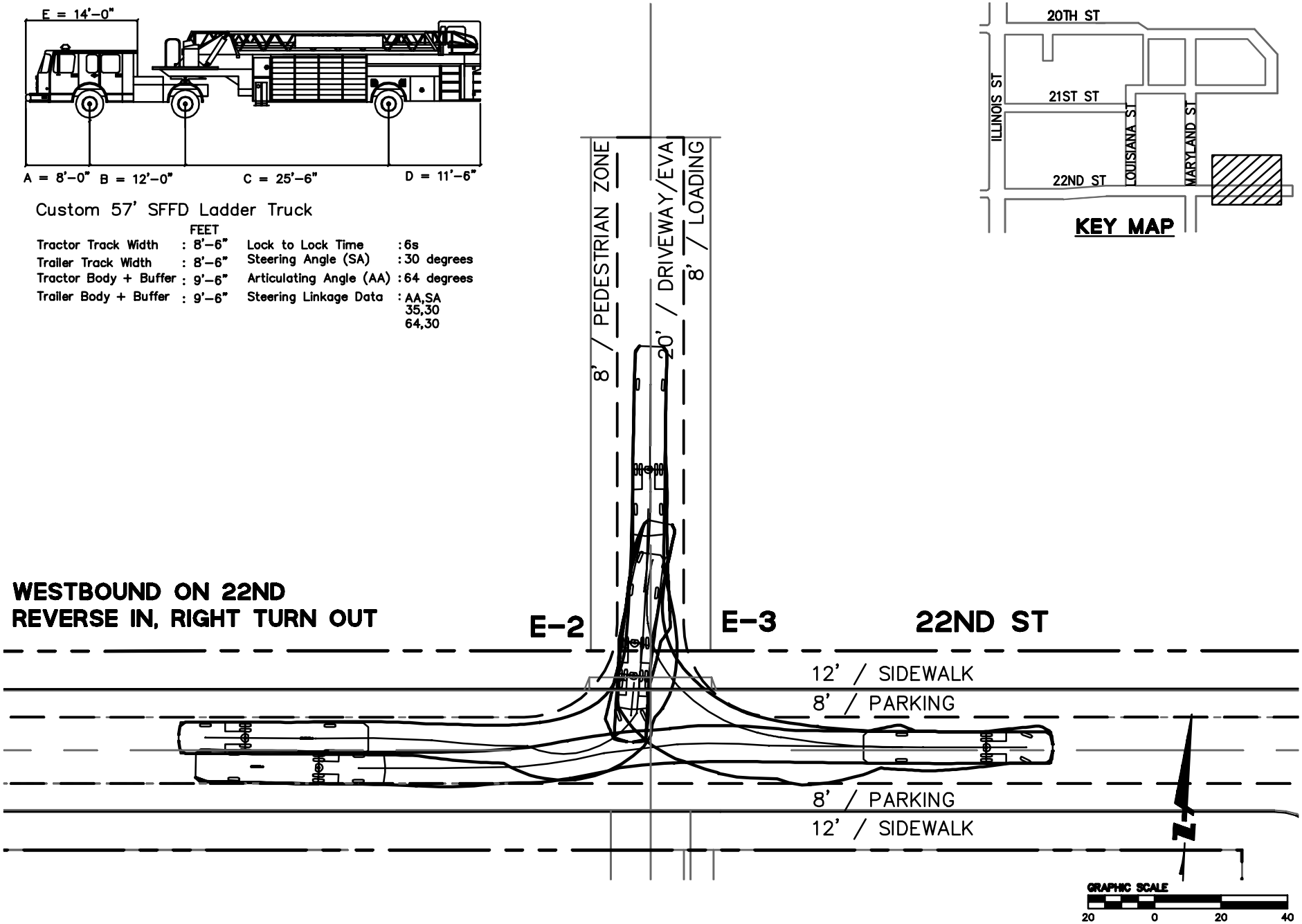
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



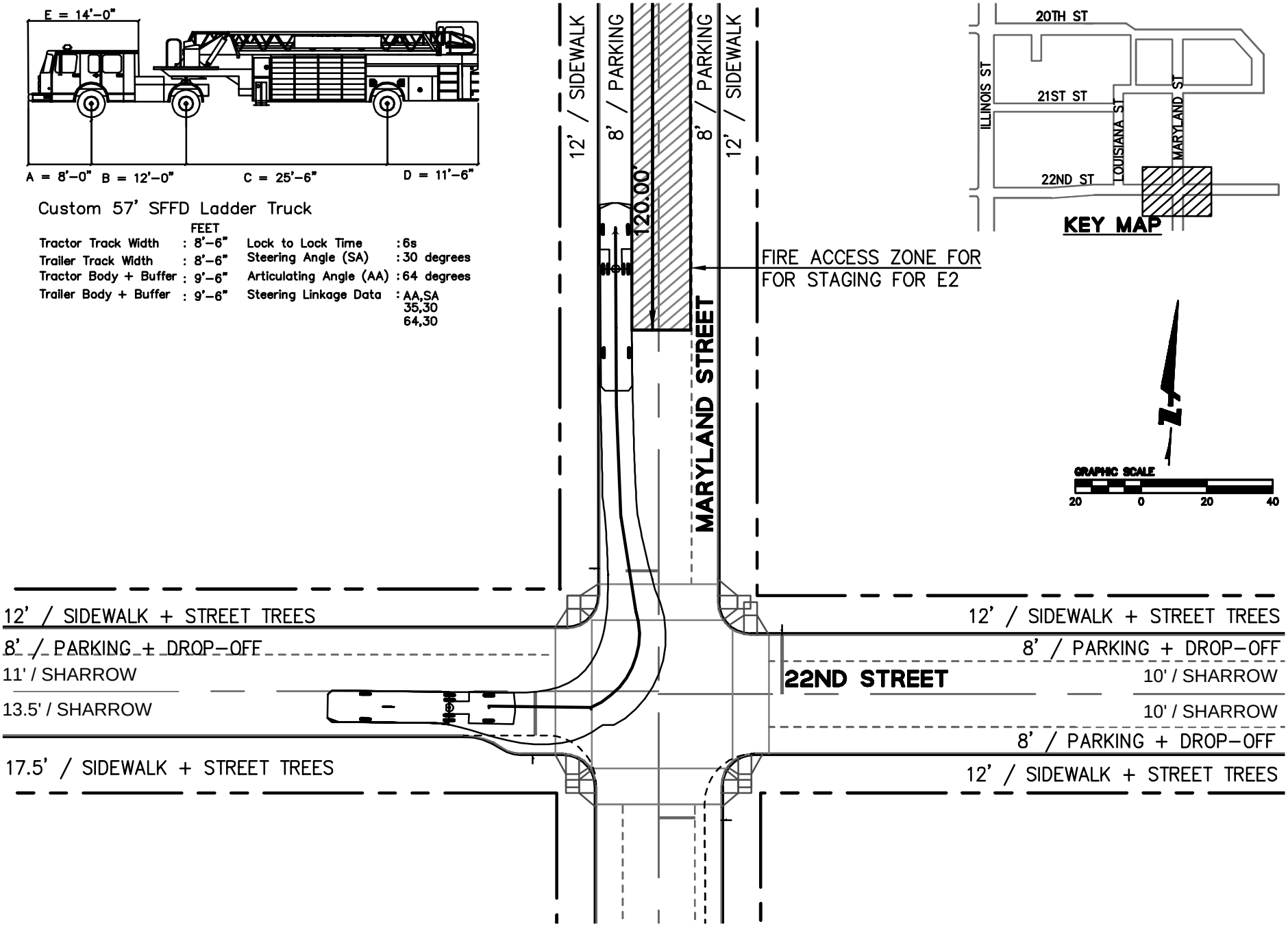
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



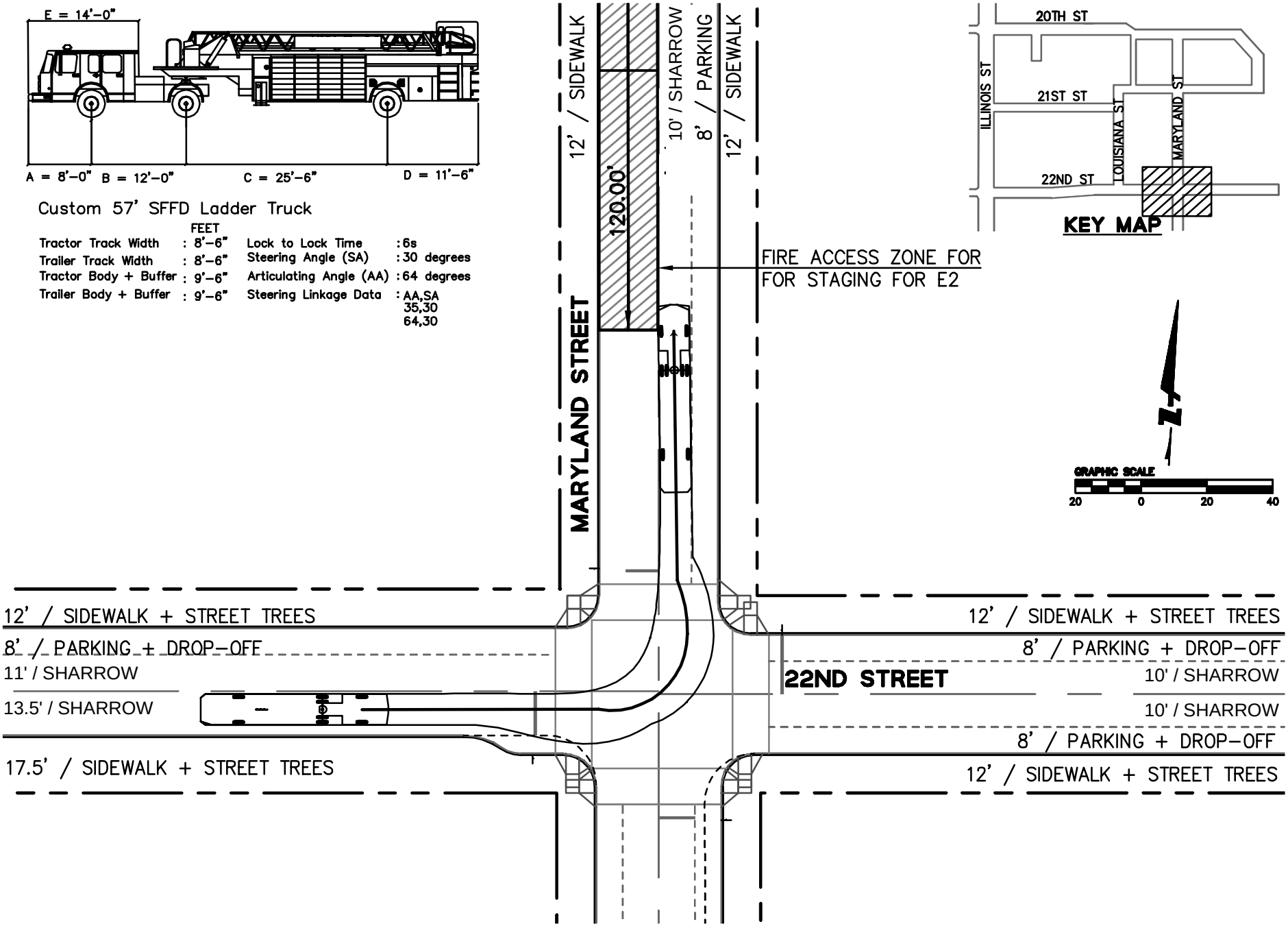
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



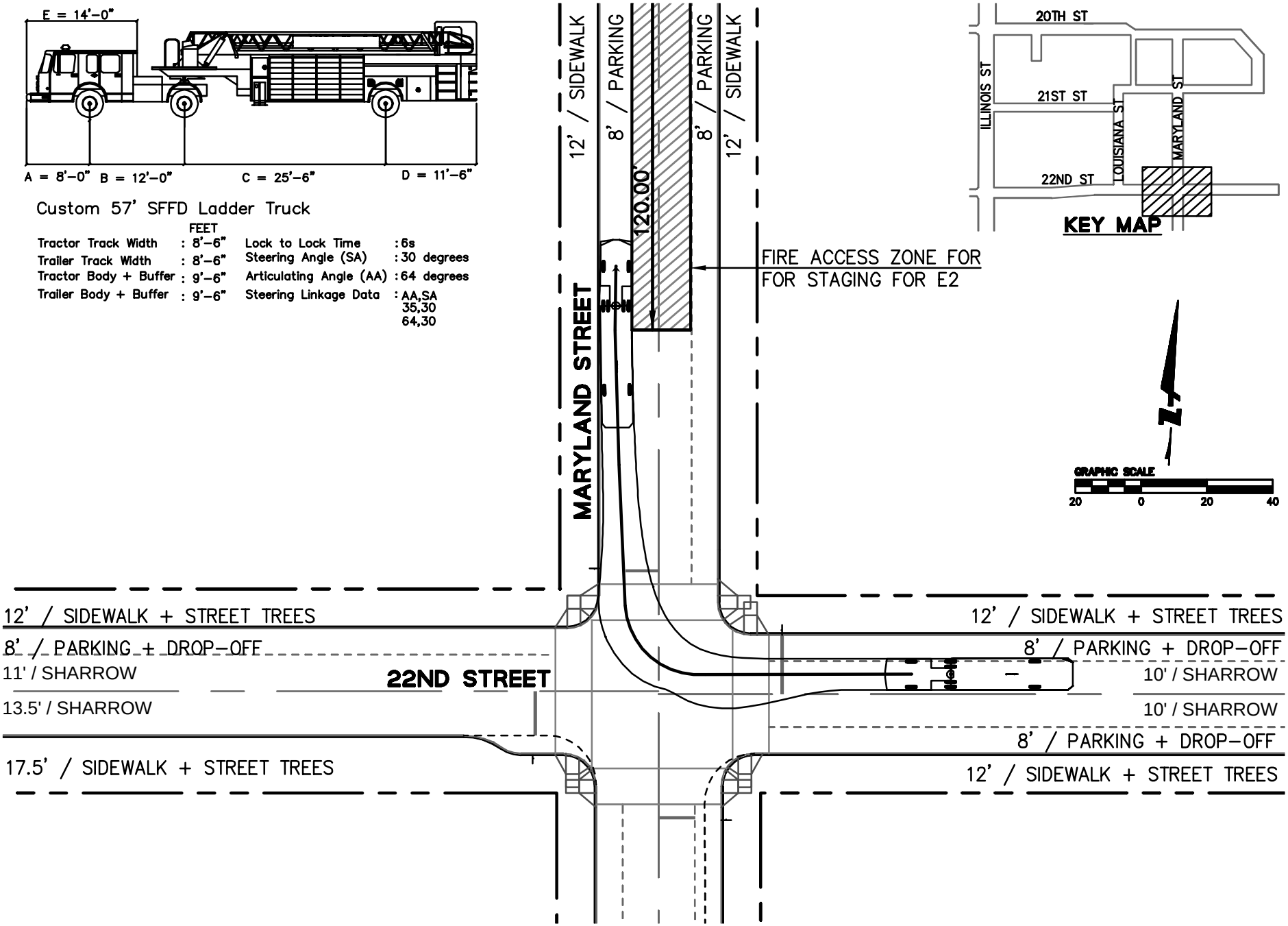
Custom 57' SFFD Ladder Truck

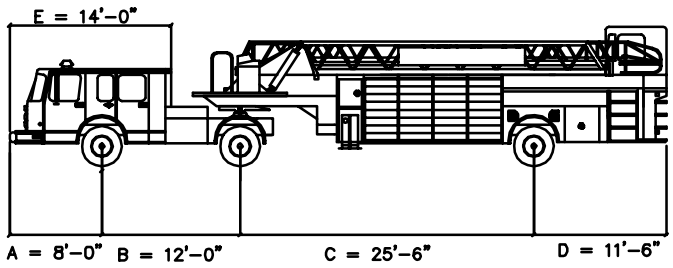
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

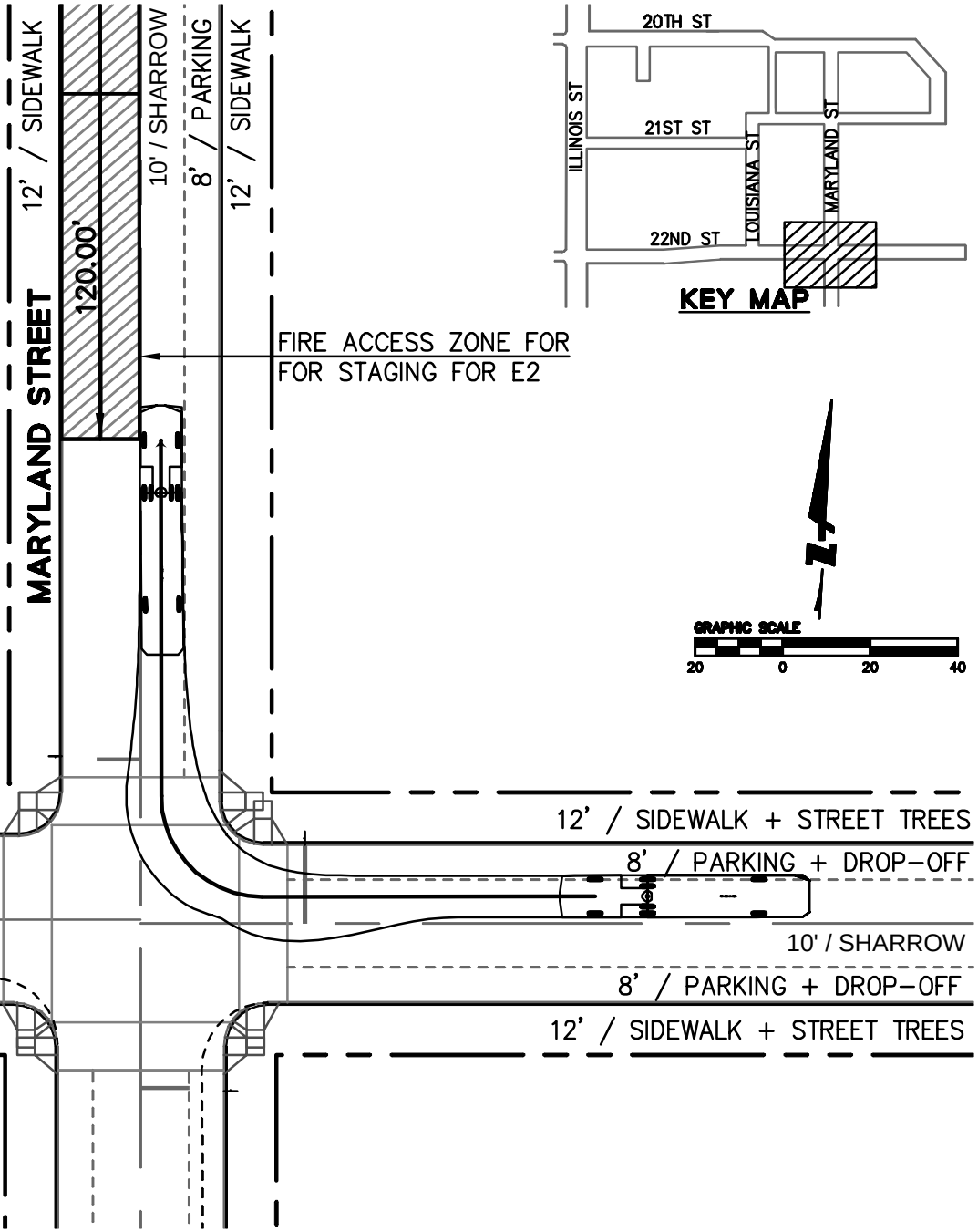
	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30





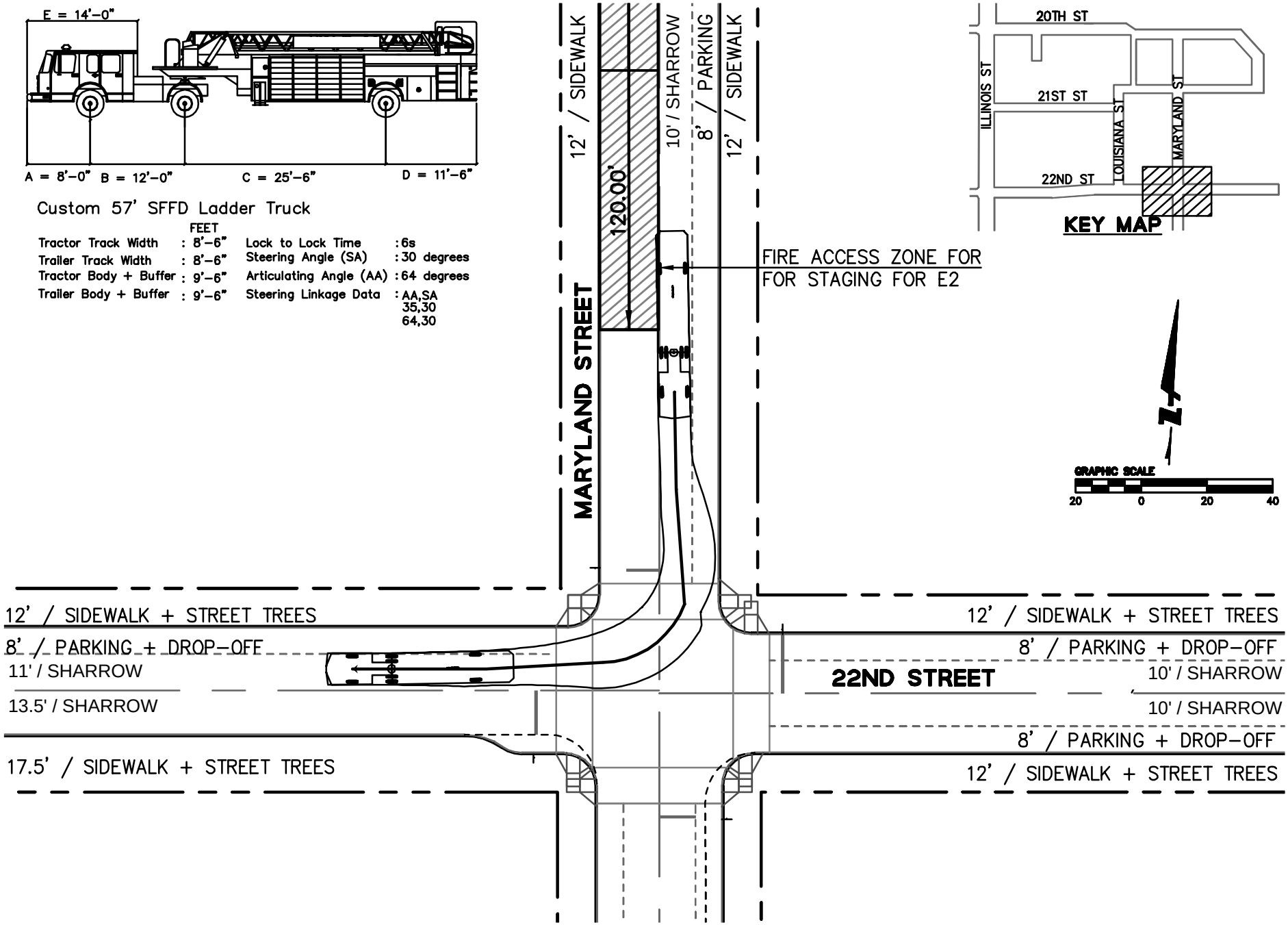
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



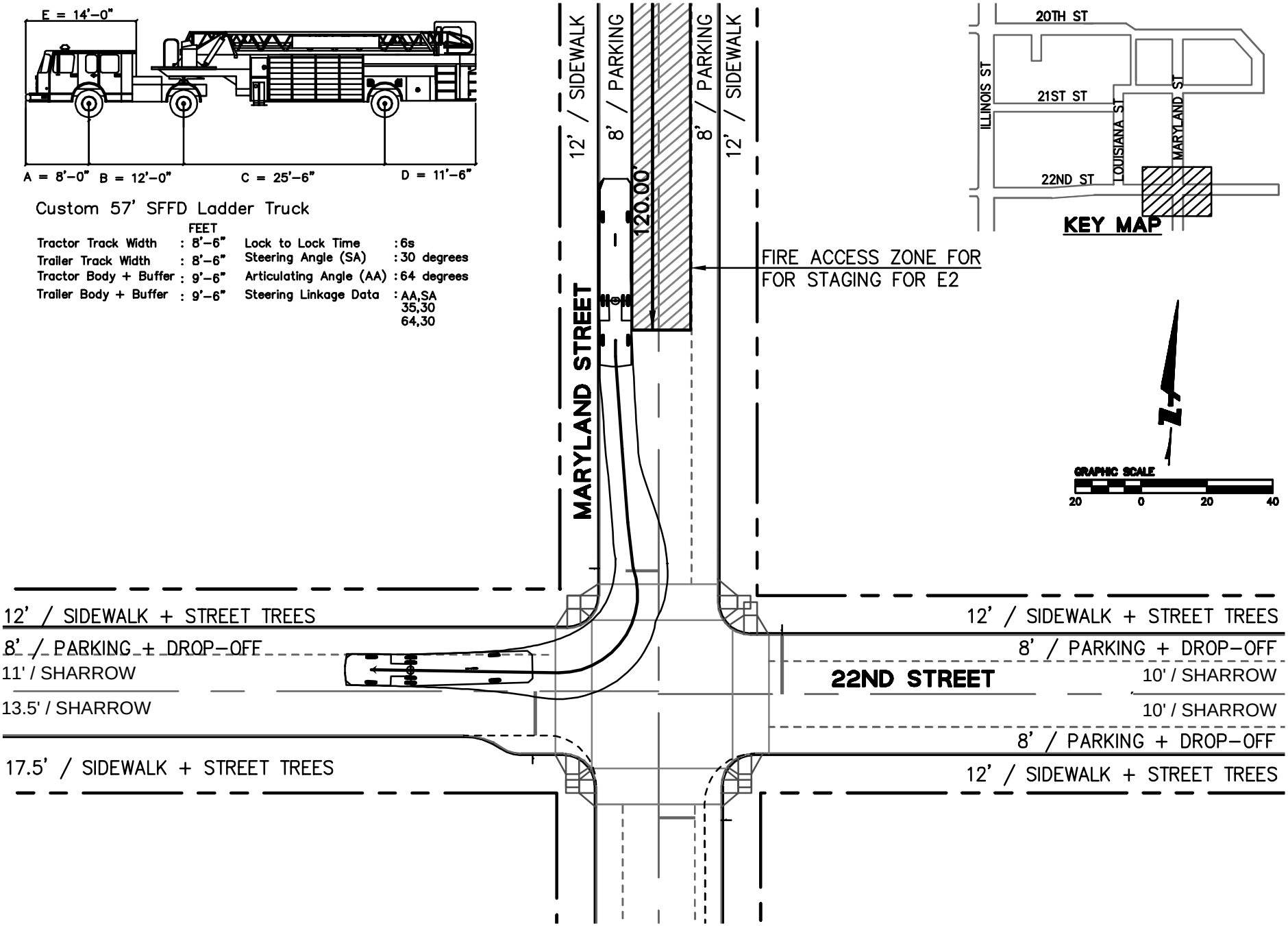
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



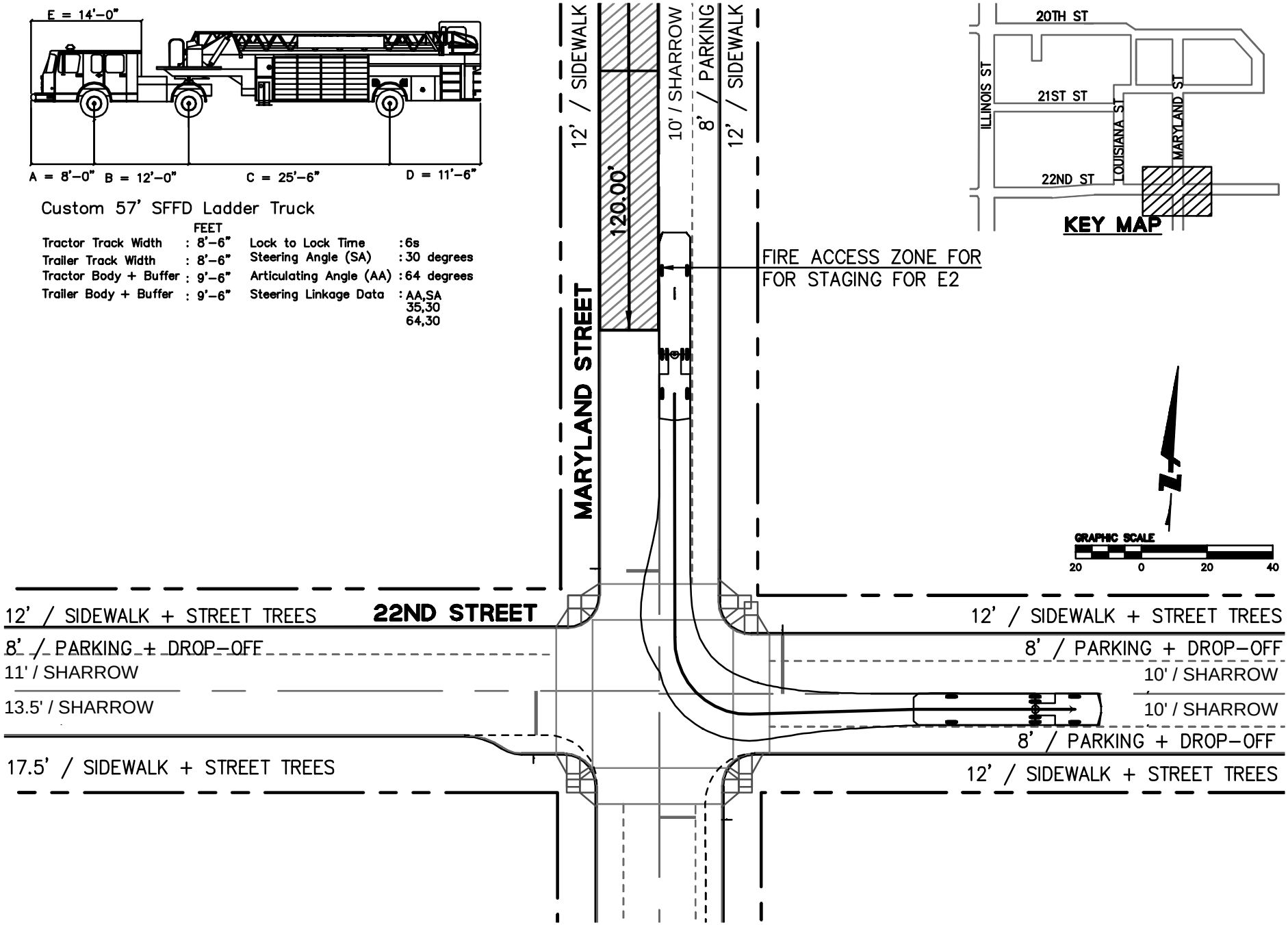
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



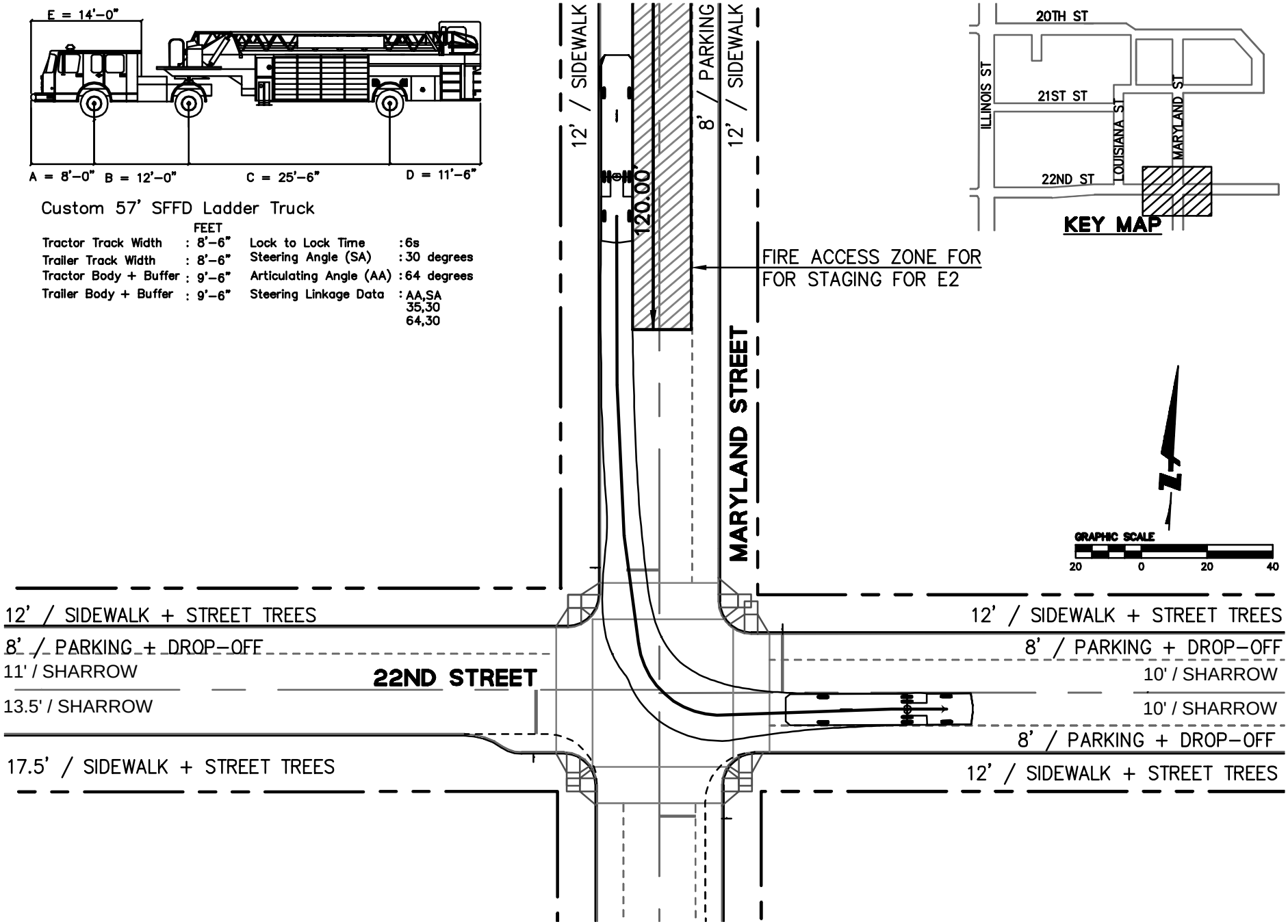
Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30



Custom 57' SFFD Ladder Truck

	FEET		
Tractor Track Width	: 8'-6"	Lock to Lock Time	: 6s
Trailer Track Width	: 8'-6"	Steering Angle (SA)	: 30 degrees
Tractor Body + Buffer	: 9'-6"	Articulating Angle (AA)	: 64 degrees
Trailer Body + Buffer	: 9'-6"	Steering Linkage Data	: AA,SA 35,30 64,30

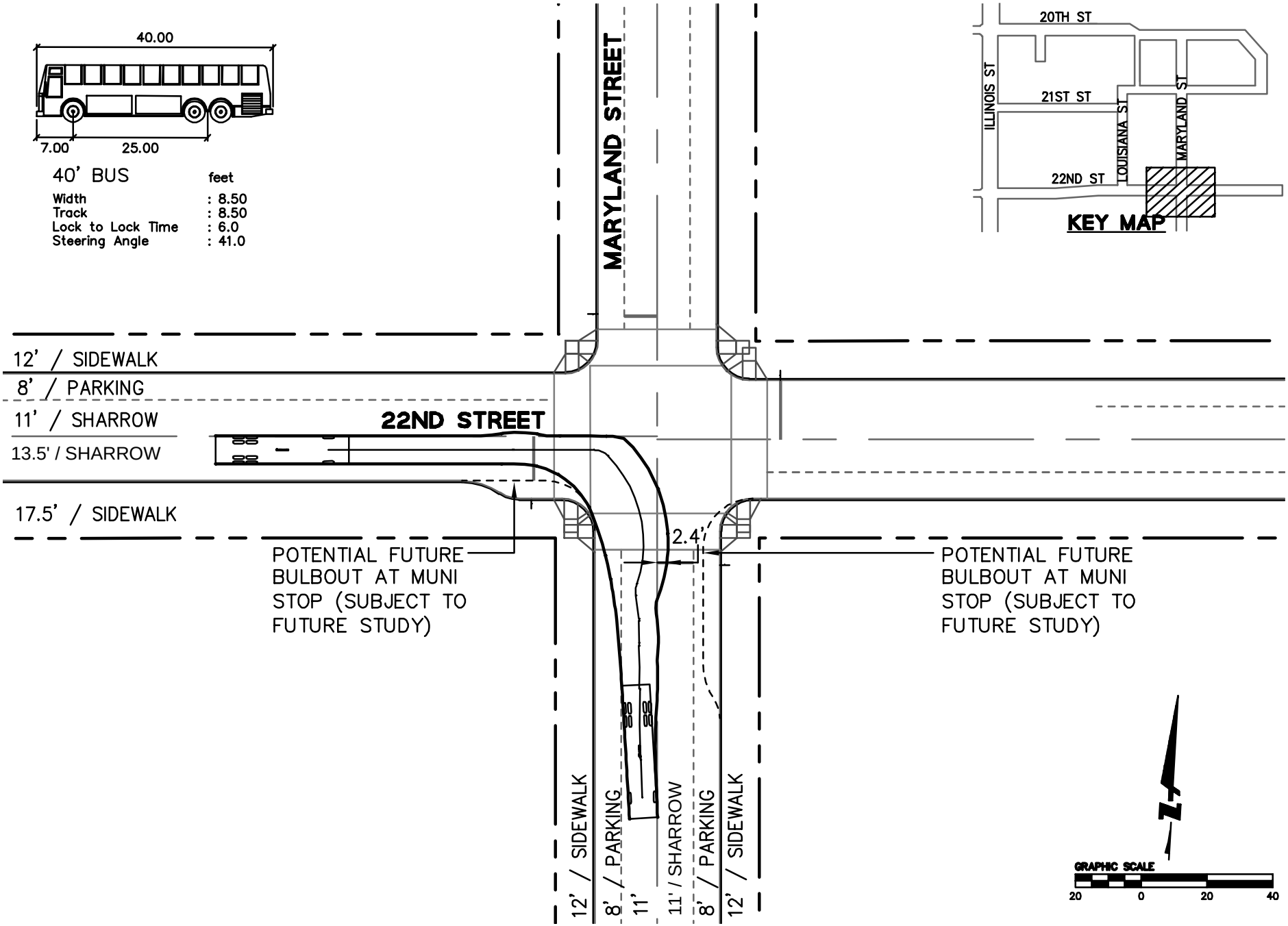


ATTACHMENT D

Bus Turning Studies

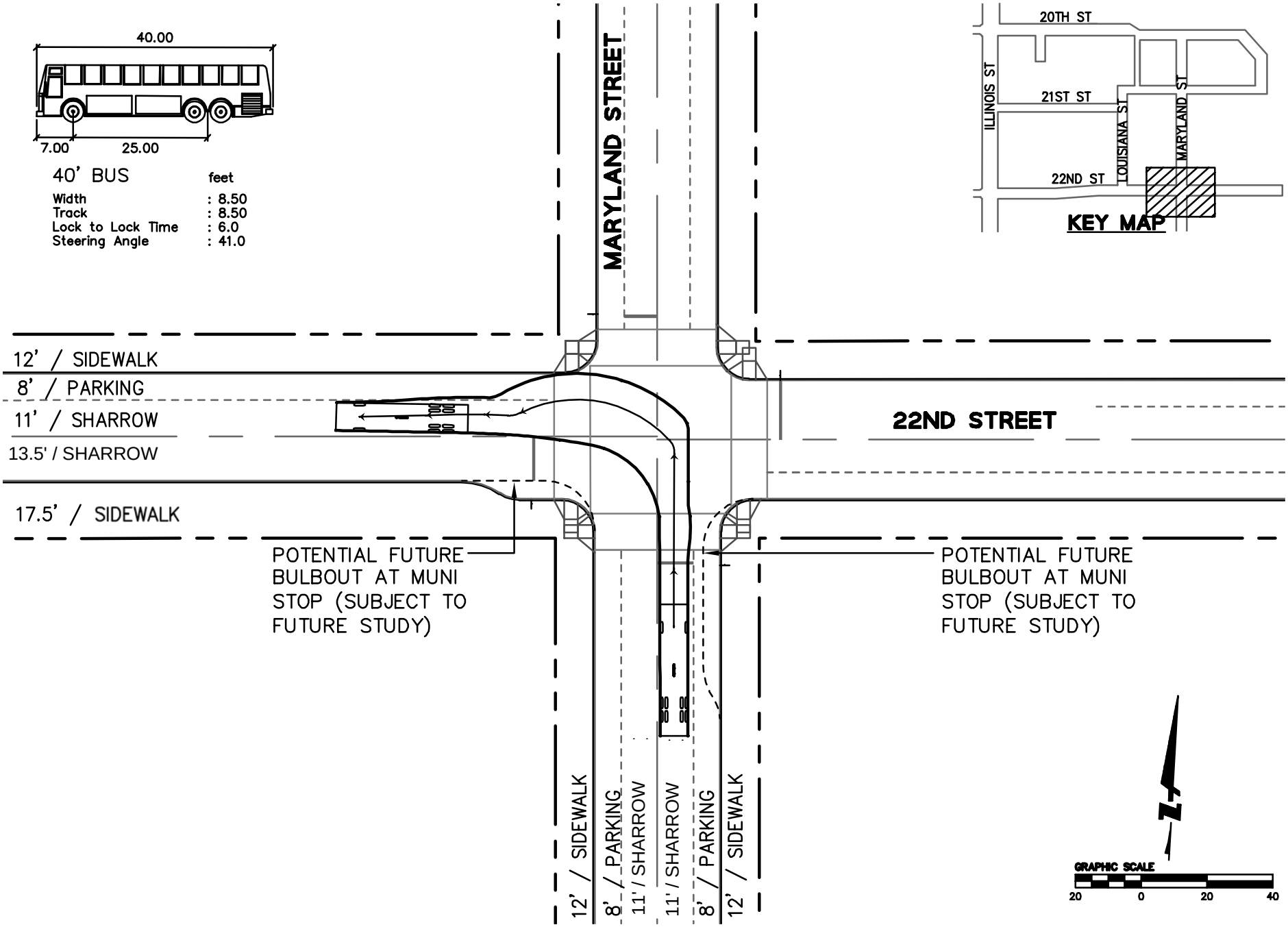
40' BUS feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.0



40' BUS feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.0



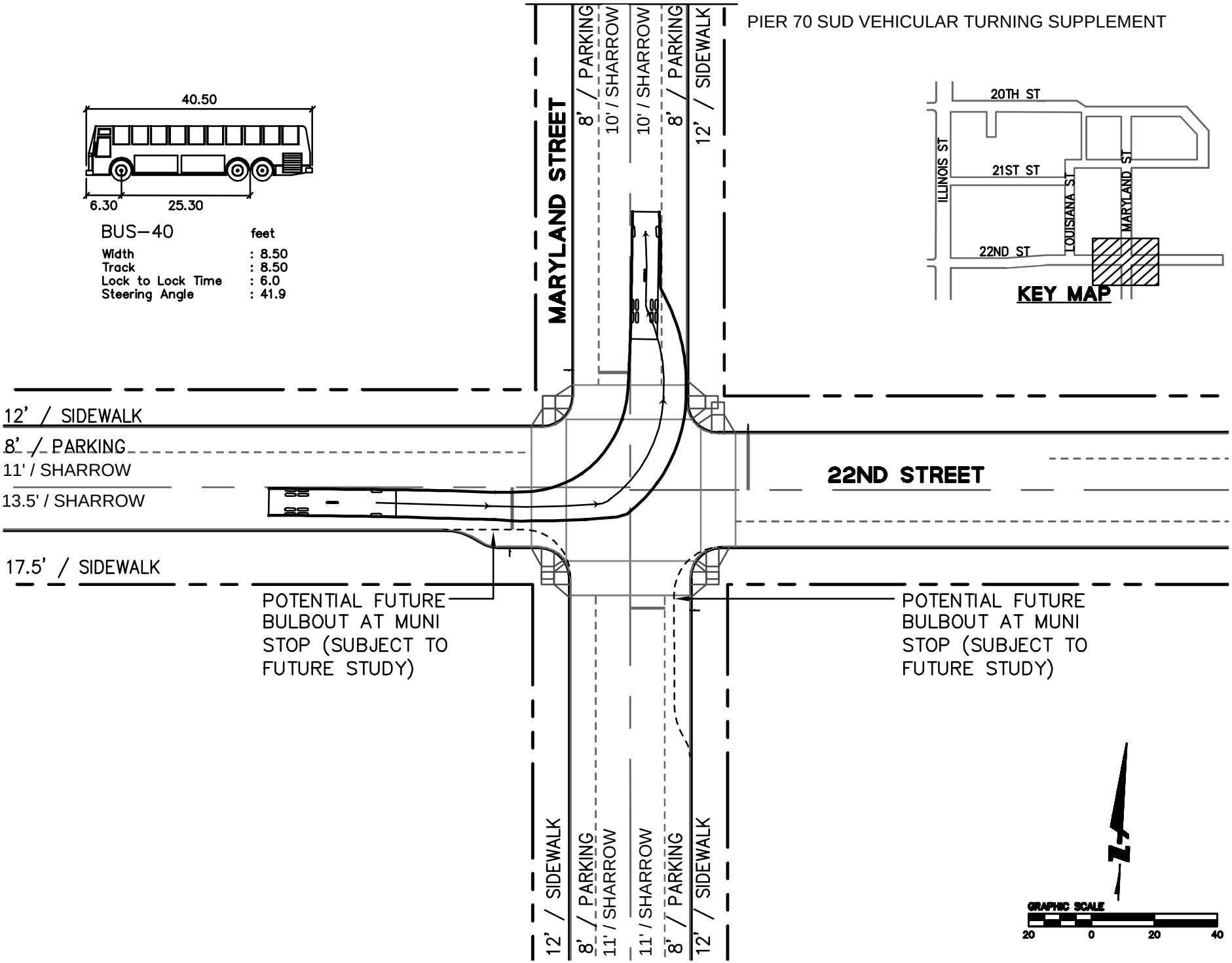
ATTACHMENT E

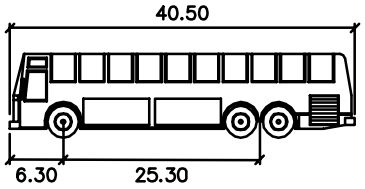
Commercial Shuttle Turning Studies

PIER 70 SUD VEHICULAR TURNING SUPPLEMENT

BUS–40 feet

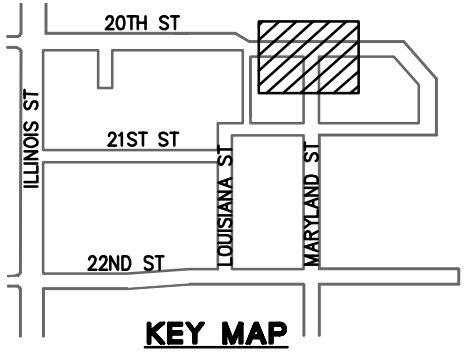
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.9

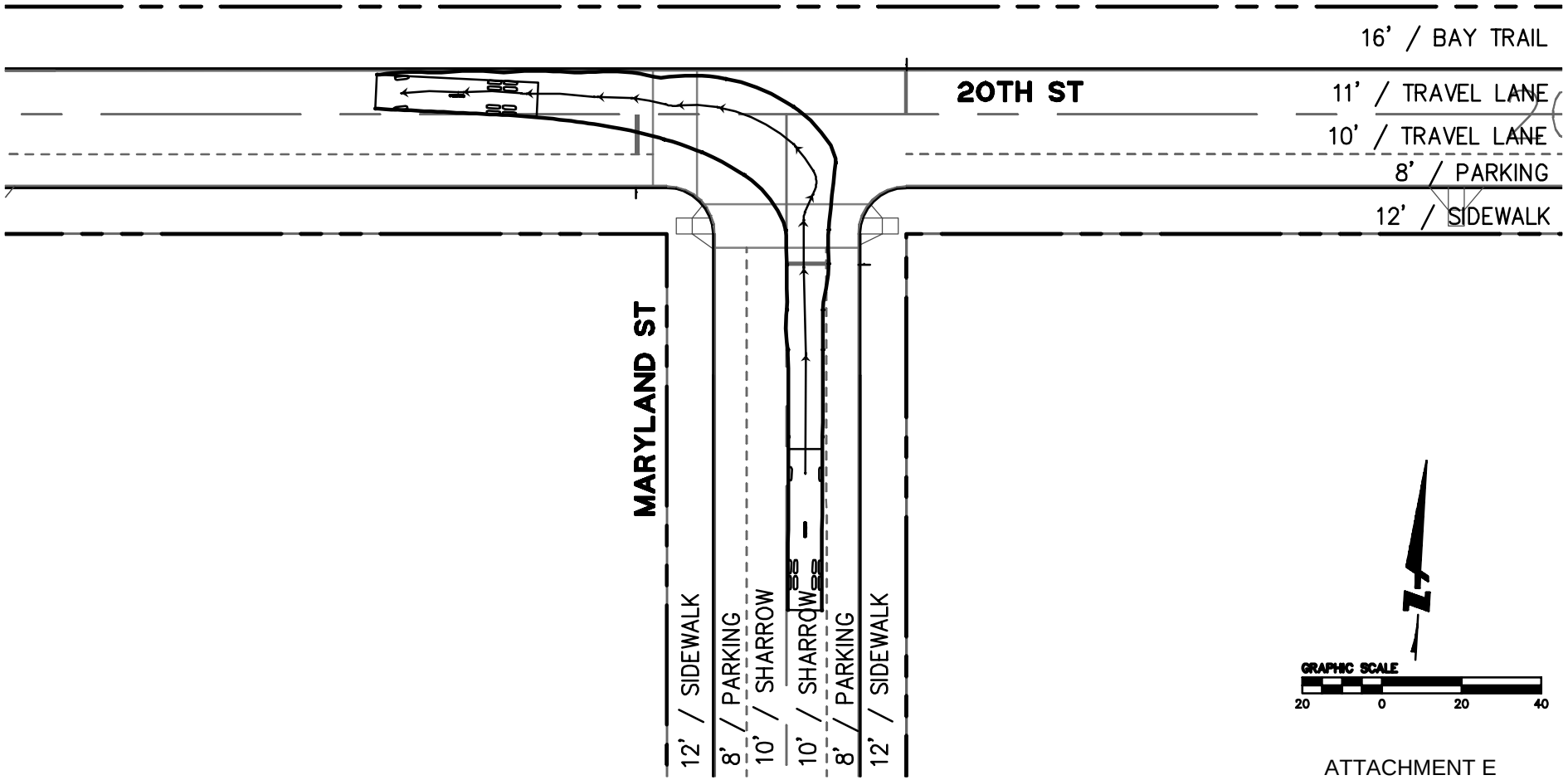


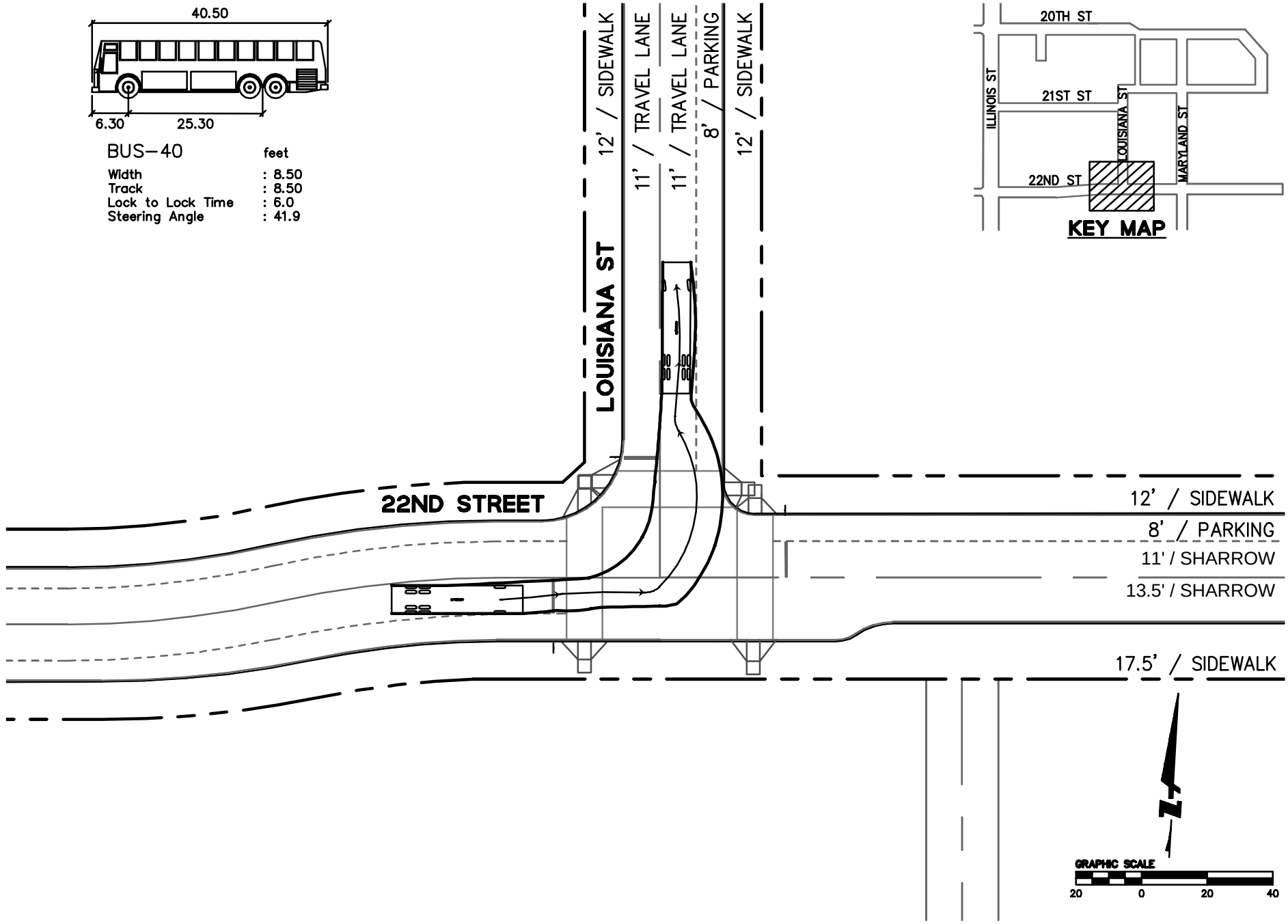


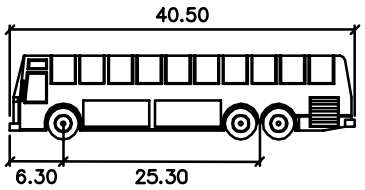
BUS–40 feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.9



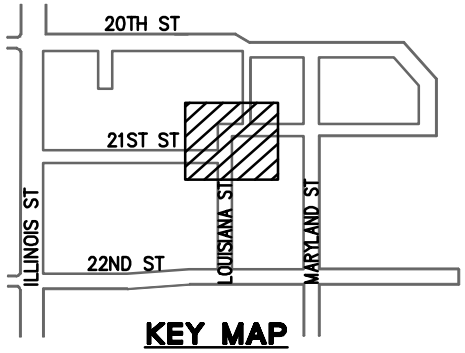



40.50
6.30
25.30
BUS–40
feet
Width : 8.50
Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 41.9
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
LOUISIANA ST
12' / SIDEWALK
11' / TRAVEL LANE
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
22ND STREET
12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK
GRAPHIC SCALE
20 0 20 40

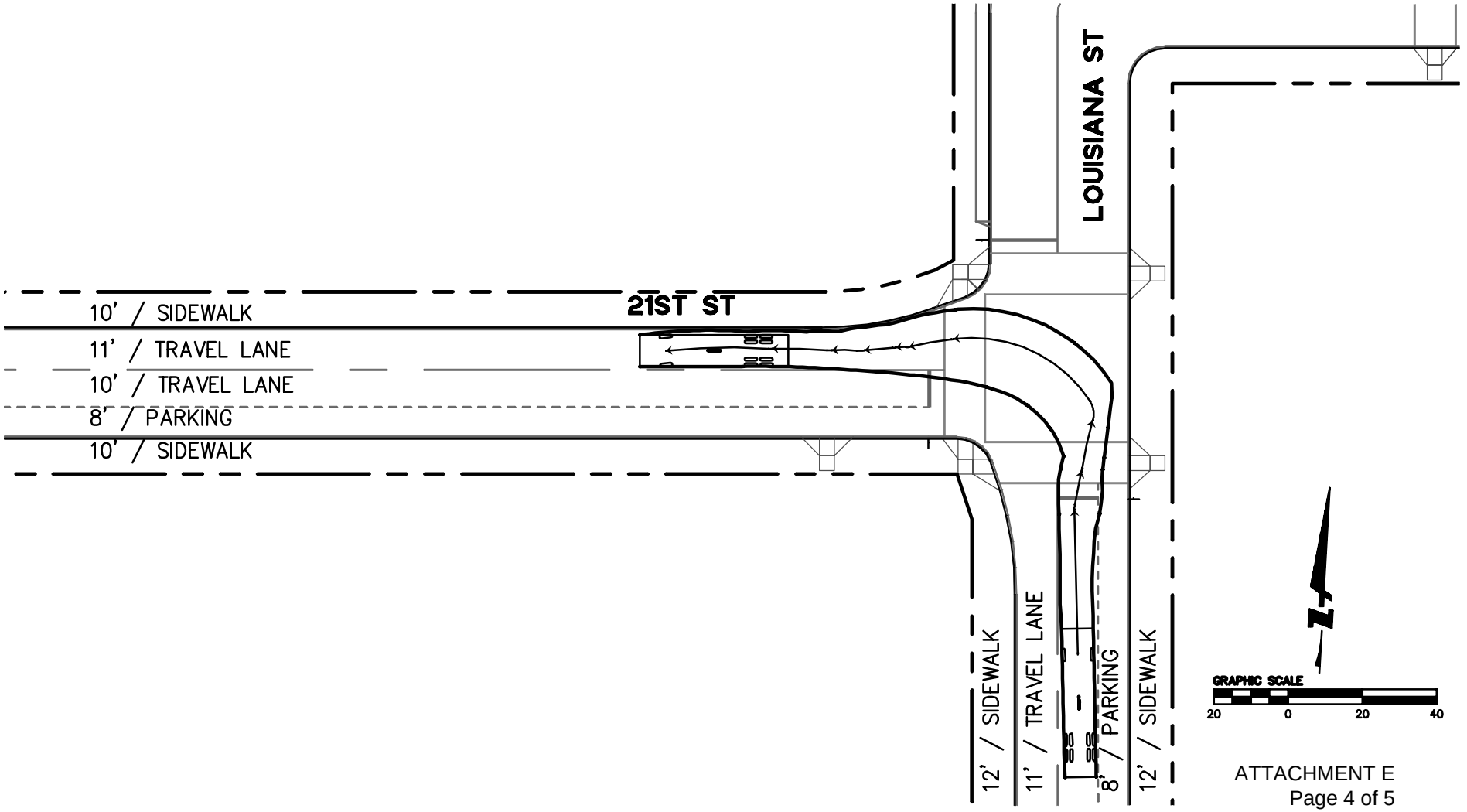


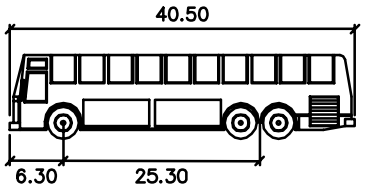
BUS–40 feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.9



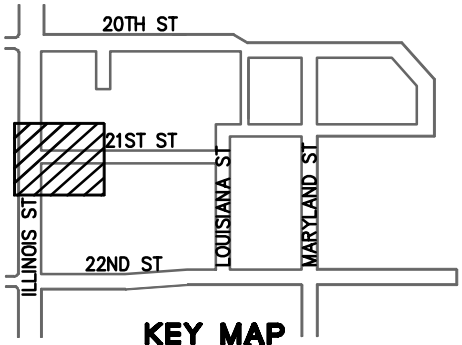
KEY MAP



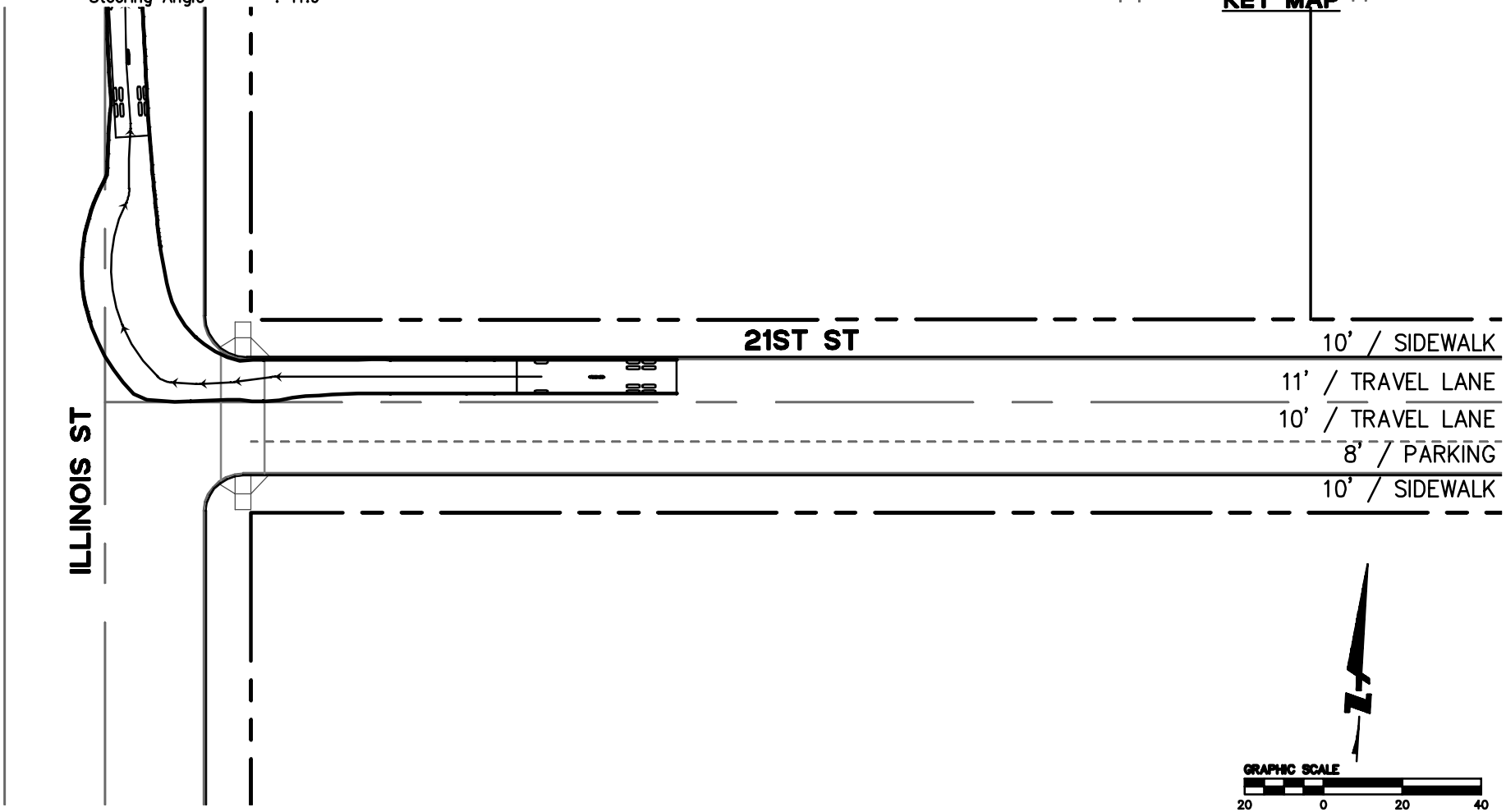


BUS–40 feet

Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.9

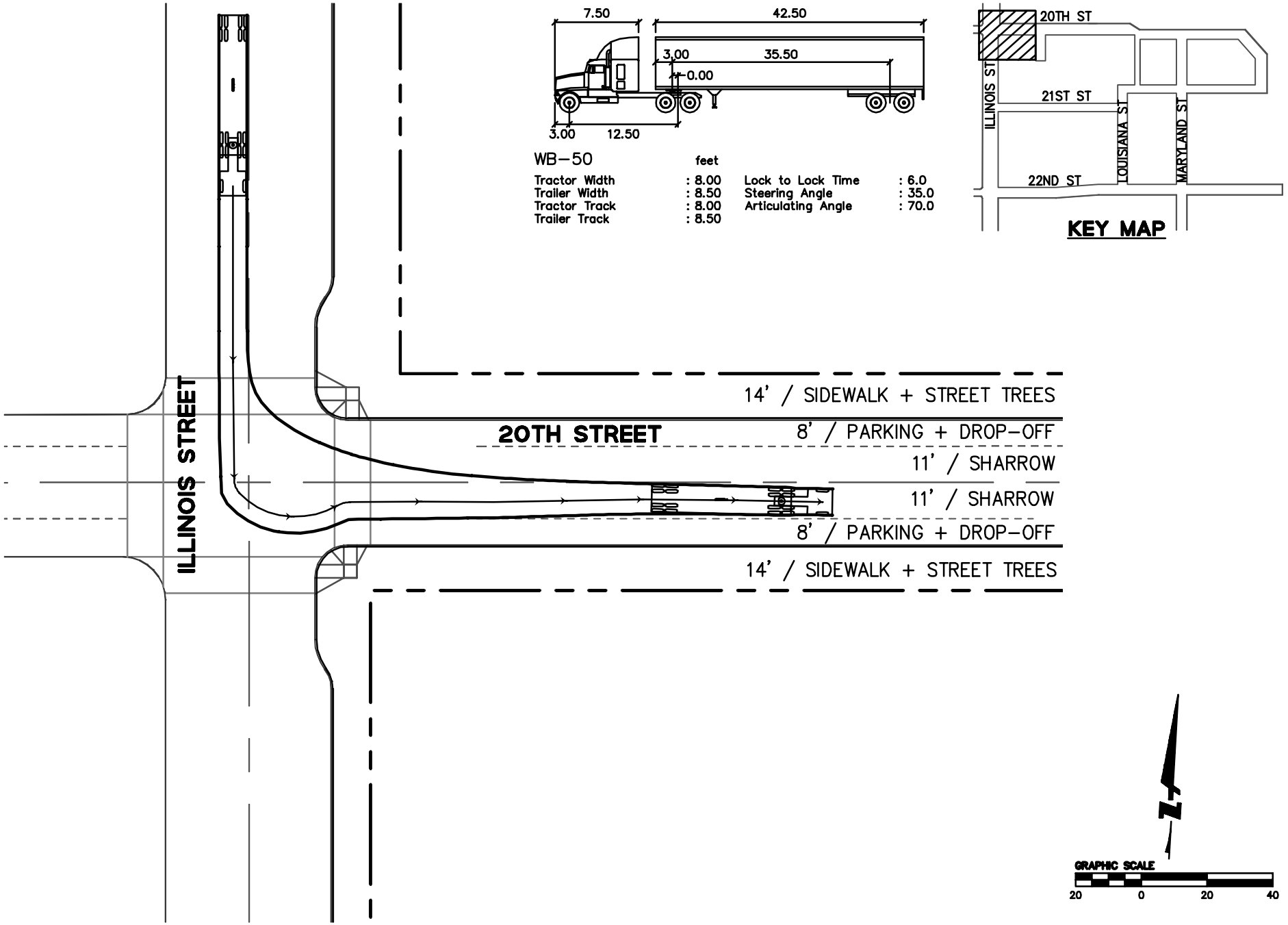


KEY MAP



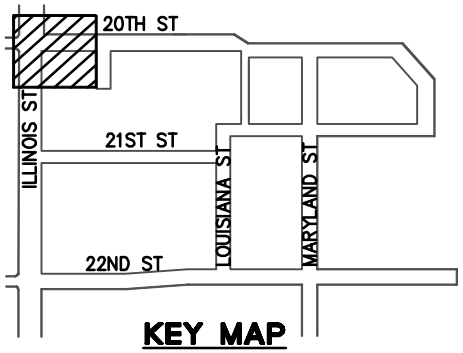
ATTACHMENT F

WB-50 Turning Studies

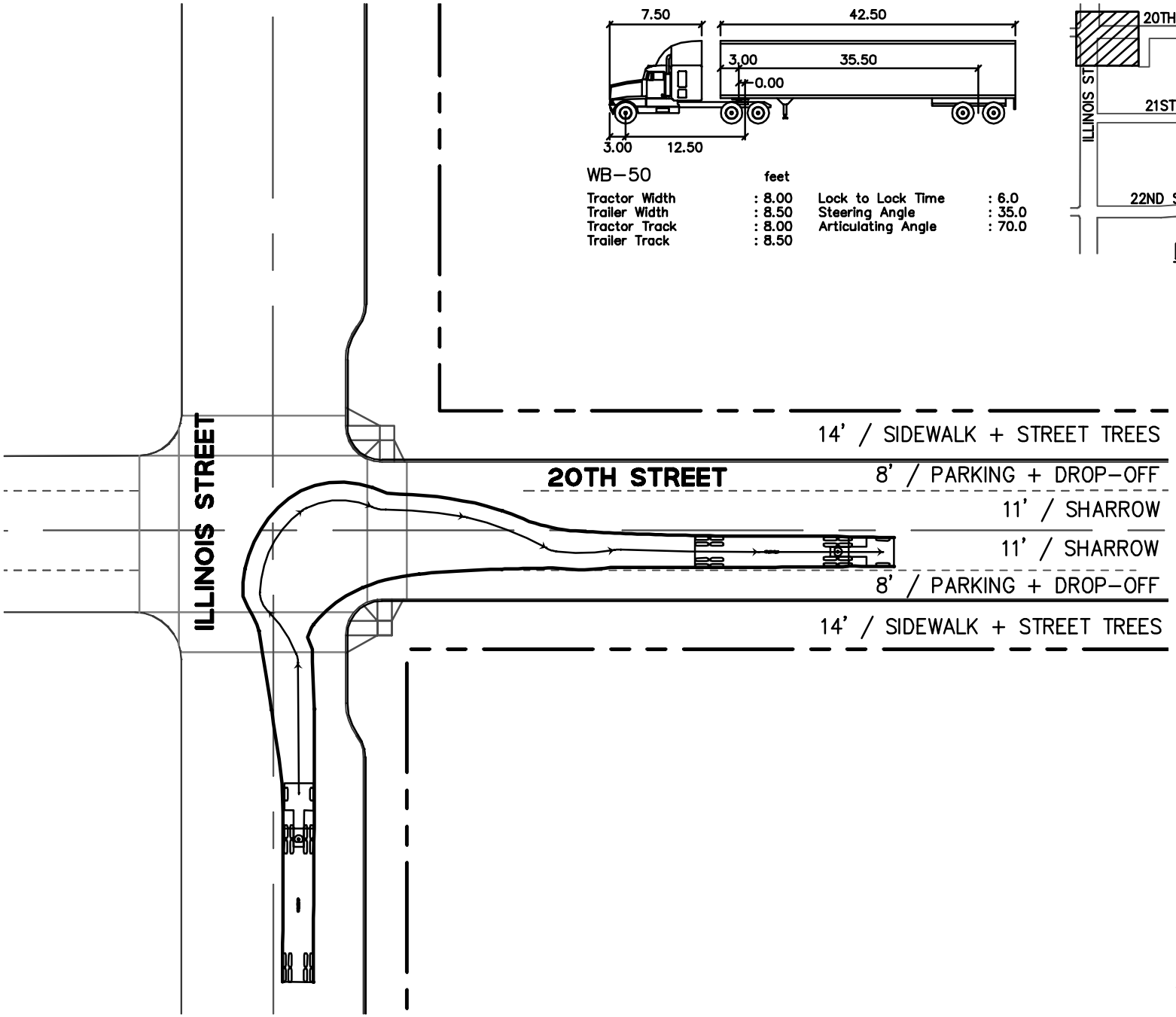

7.50
42.50
3.00
35.50
0.00
3.00
12.50
WB–50
feet
Tractor Width : 8.00
Trailer Width : 8.50
Tractor Track : 8.00
Trailer Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 35.0
Articulating Angle : 70.0
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
ILLINOIS STREET
20TH STREET
14' / SIDEWALK + STREET TREES
8' / PARKING + DROP–OFF
11' / SHARROW
11' / SHARROW
8' / PARKING + DROP–OFF
14' / SIDEWALK + STREET TREES
GRAPHIC SCALE
20
0
20
40

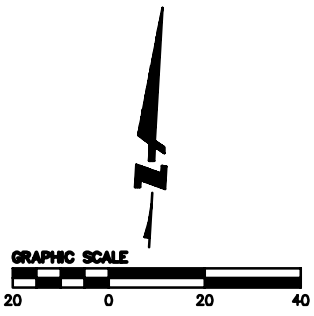
WB–50 feet

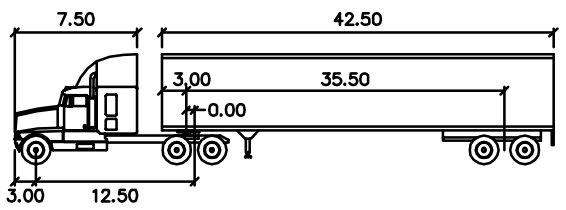
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 35.0
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KEY MAP

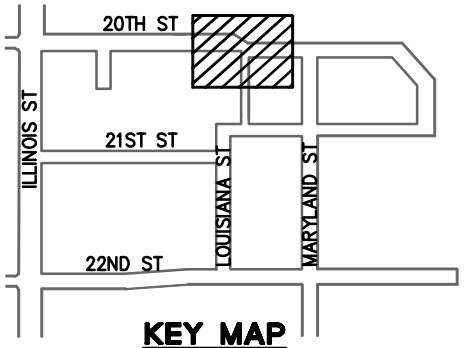




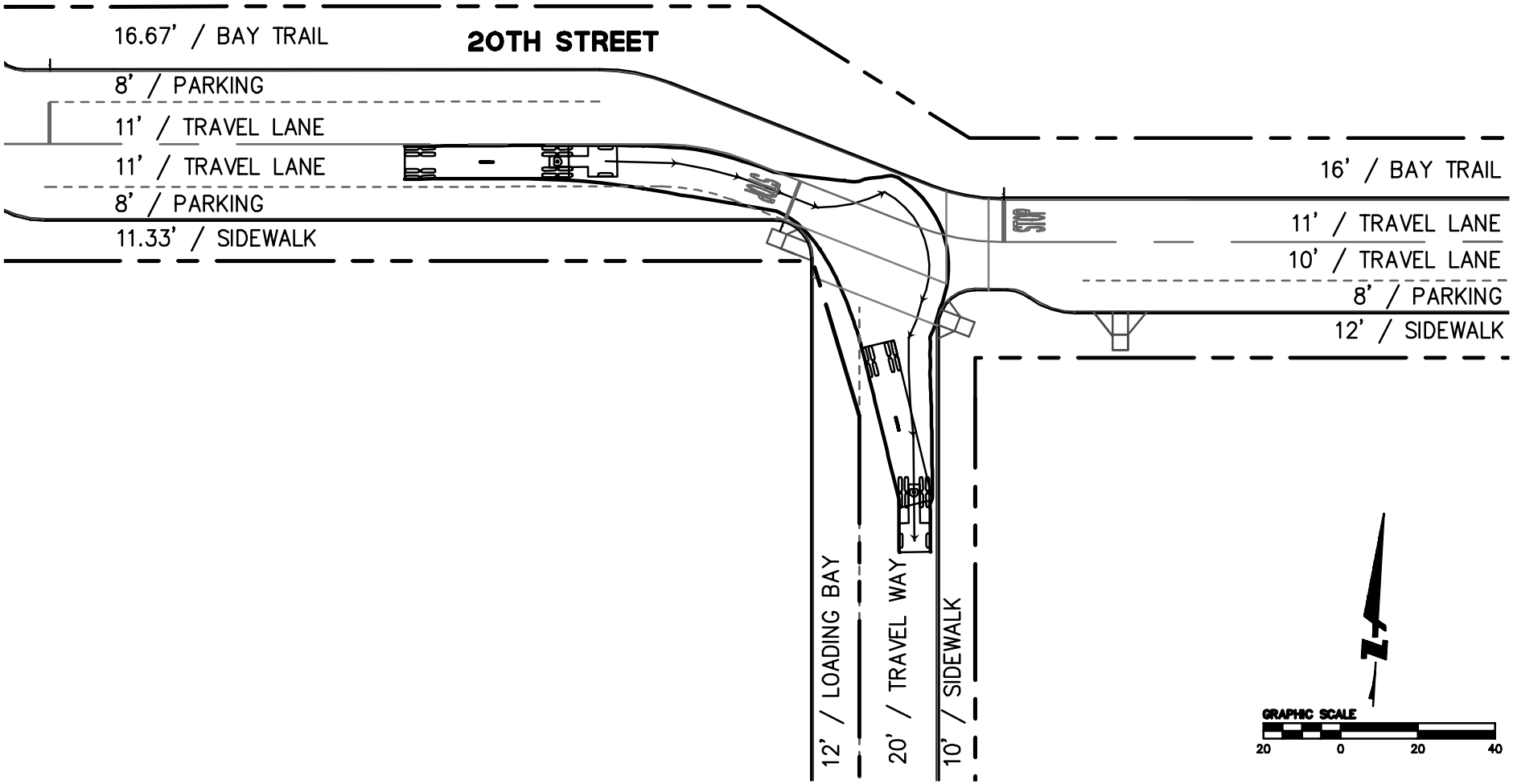


WB–50 feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 35.0
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		



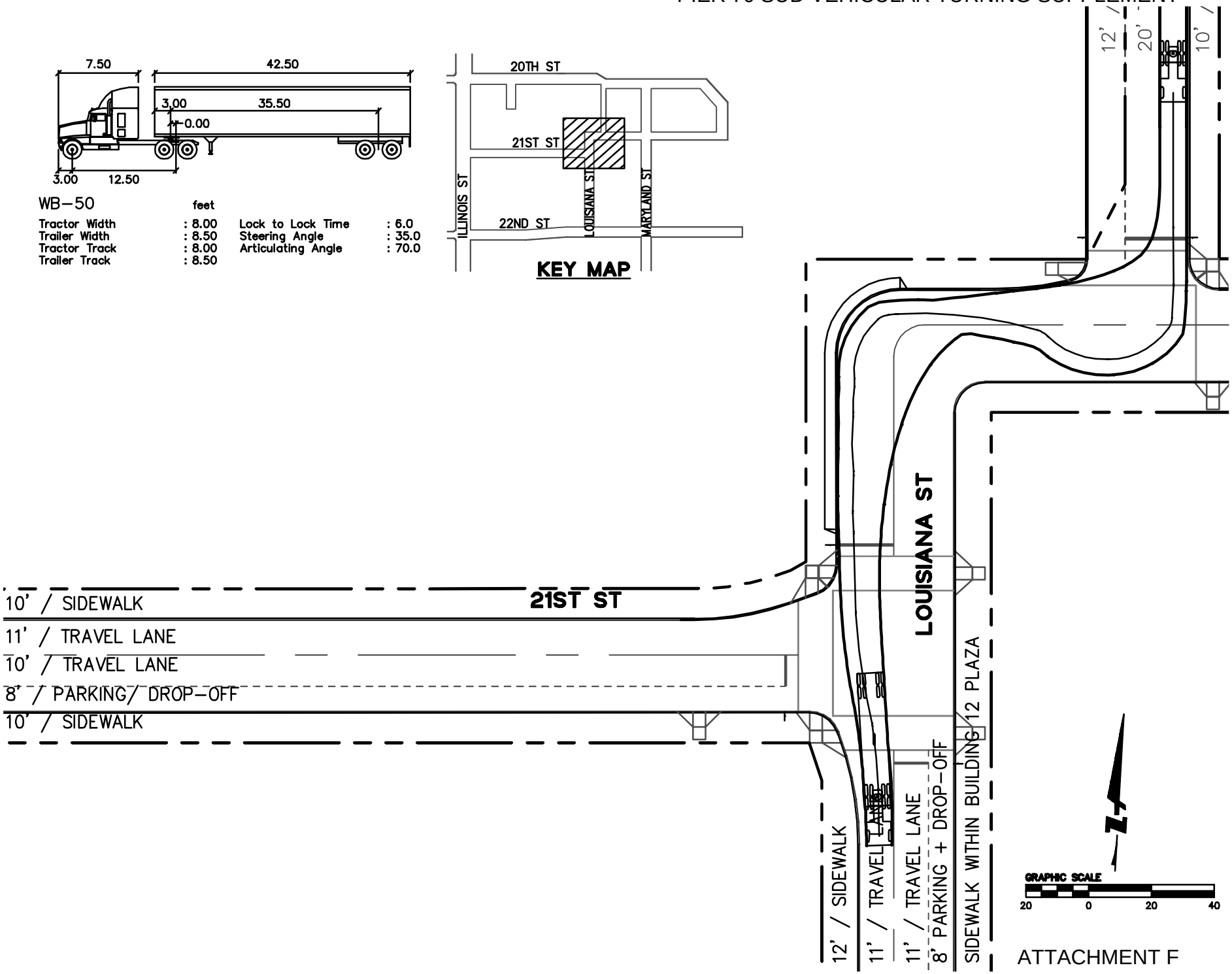
KEY MAP

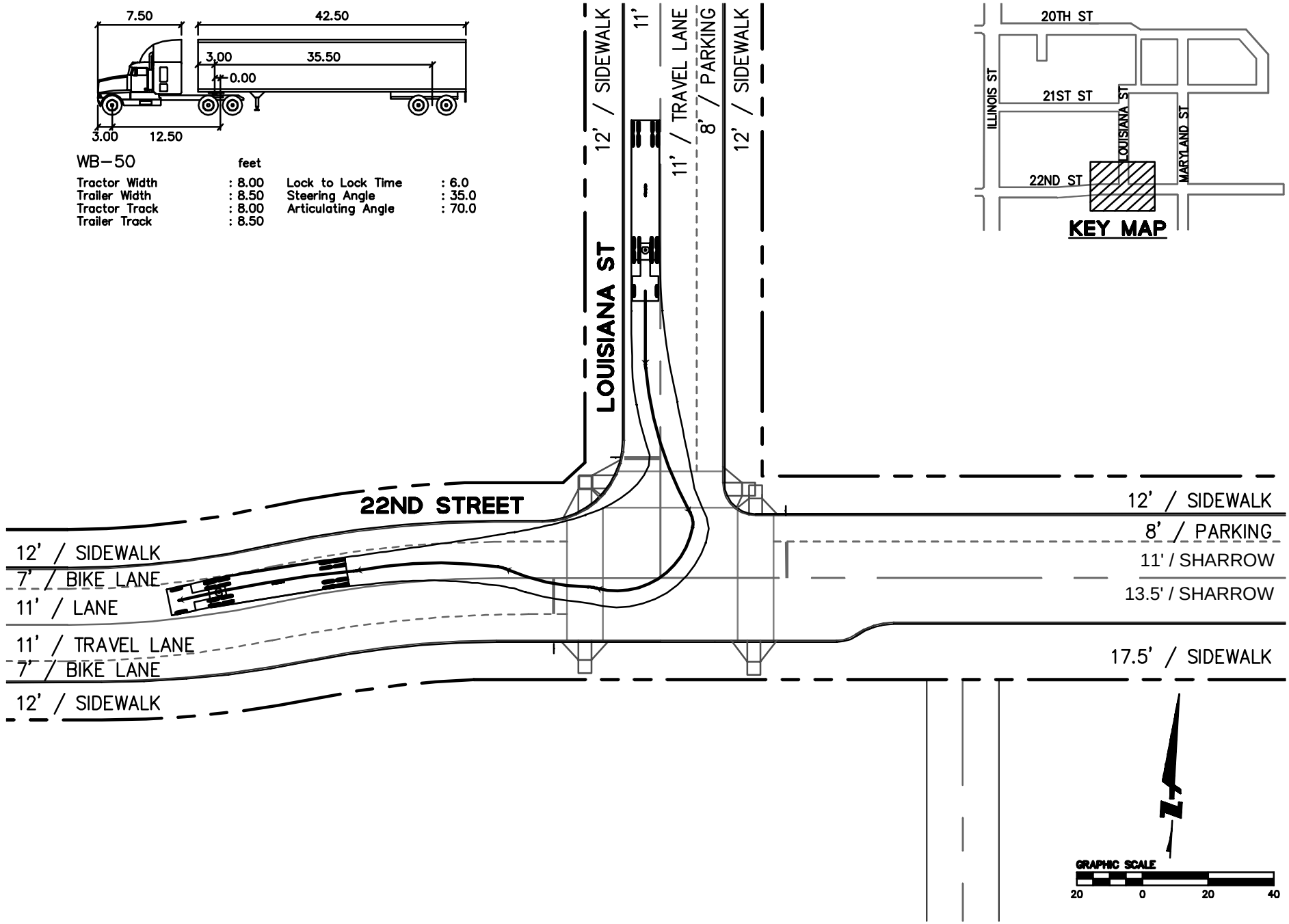


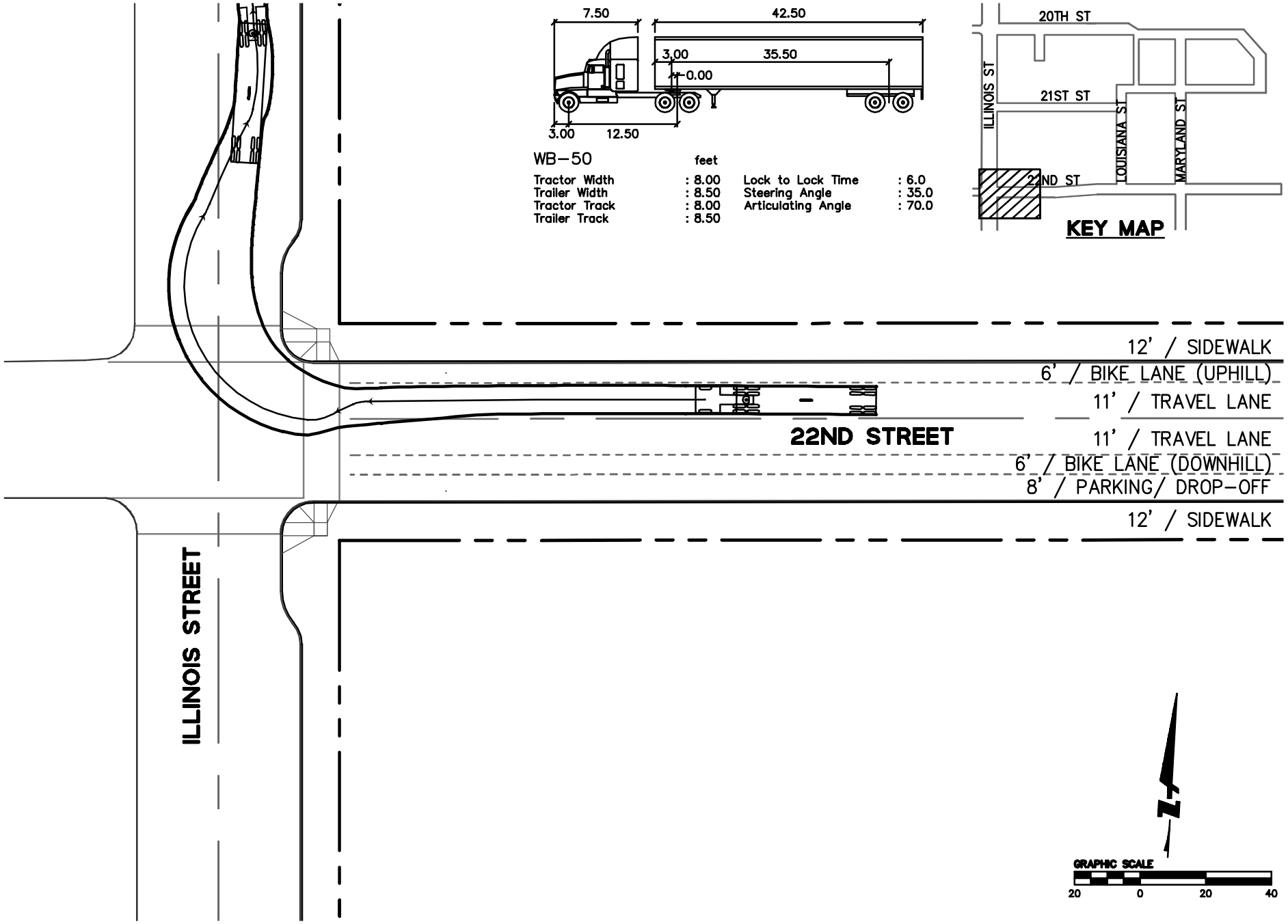
WB–50 feet

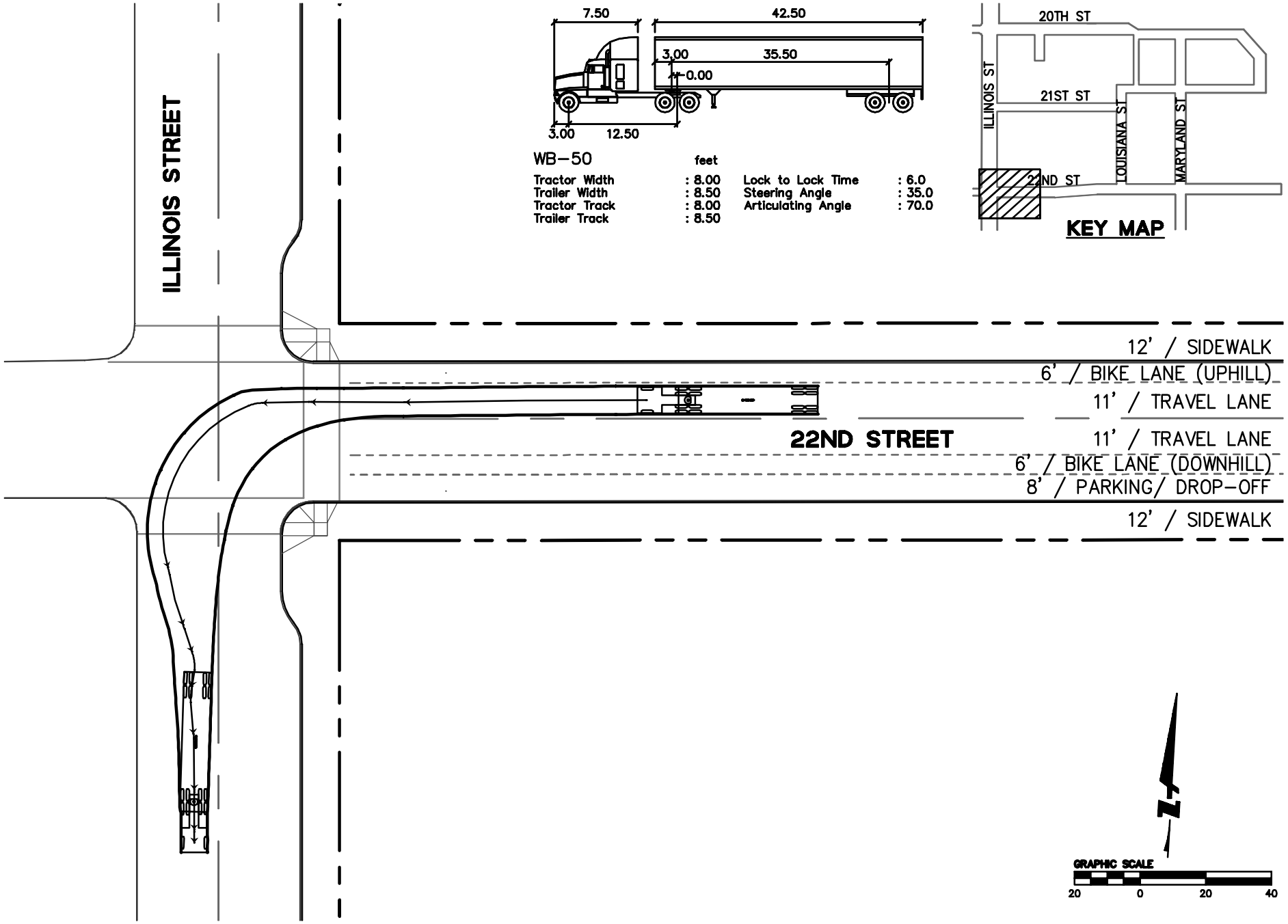
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 35.0
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

KEY MAP




7.50
42.50
3.00
35.50
0.00
3.00
12.50
WB–50
feet
Tractor Width : 8.00
Trailer Width : 8.50
Tractor Track : 8.00
Trailer Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 35.0
Articulating Angle : 70.0
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
LOUISIANA ST
12' / SIDEWALK
11'
11' / TRAVEL LANE
8' / PARKING
12' / SIDEWALK
22ND STREET
12' / SIDEWALK
7' / BIKE LANE
11' / LANE
11' / TRAVEL LANE
7' / BIKE LANE
12' / SIDEWALK
12' / SIDEWALK
8' / PARKING
11' / SHARROW
13.5' / SHARROW
17.5' / SIDEWALK
GRAPHIC SCALE
20 0 20 40


7.50
42.50
3.00
35.50
0.00
3.00
12.50
WB–50
feet
Tractor Width : 8.00
Trailer Width : 8.50
Tractor Track : 8.00
Trailer Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 35.0
Articulating Angle : 70.0
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
12' / SIDEWALK
6' / BIKE LANE (UPHILL)
11' / TRAVEL LANE
22ND STREET
11' / TRAVEL LANE
6' / BIKE LANE (DOWNHILL)
8' / PARKING/ DROP–OFF
12' / SIDEWALK
ILLINOIS STREET
N
GRAPHIC SCALE
20 0 20 40


ILLINOIS STREET
7.50
42.50
3.00
35.50
0.00
3.00
12.50
WB–50
feet
Tractor Width : 8.00
Trailer Width : 8.50
Tractor Track : 8.00
Trailer Track : 8.50
Lock to Lock Time : 6.0
Steering Angle : 35.0
Articulating Angle : 70.0
20TH ST
ILLINOIS ST
21ST ST
LOUISIANA ST
MARYLAND ST
22ND ST
KEY MAP
12' / SIDEWALK
6' / BIKE LANE (UPHILL)
11' / TRAVEL LANE
22ND STREET
11' / TRAVEL LANE
6' / BIKE LANE (DOWNHILL)
8' / PARKING/ DROP–OFF
12' / SIDEWALK
GRAPHIC SCALE
20 0 20 40