



BRIDGE Housing Potrero Hill DRAFT Transportation Demand Management (TDM) Plan

October 2016



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EXECUTIVE SUMMARY

BRIDGE Housing plans to lead the redevelopment of a 38-acre site in San Francisco's Potrero Hill neighborhood. The project would replace all existing housing on the site with new public housing replacement units on a one-for-one basis and add approximately 1,000 new units including 200 affordable units and 800 market rate units. The BRIDGE Housing Potrero Hill TDM Plan identifies strategies aimed at reducing the number of car trips and/or rate of single-occupancy vehicle travel resulting from the proposed Potrero Hill redevelopment through shifting residents toward use of public transit, carpooling, and non-motorized modes. The Transportation Demand Management (TDM) plan sets a 15% PM peak-hour vehicle trip reduction target off of the baseline trips included in the Environmental Impact Report (EIR).¹

The TDM plan defines two TDM packages: the sitewide package will be implemented throughout the Potrero Hill site and will apply to both below market rate and market rate vertical developments; the market rate package which will be applicable to all market rate developers. The measures proposed in each of the TDM packages are largely influenced by the forthcoming San Francisco TDM Ordinance Menu of Options.² Table 1 summarizes the proposed TDM measures, identifies which TDM package each measure is part of, and the proposed scores³ for each measure as noted in the Draft TDM Ordinance Menu of Options.

¹ Potrero HOPE SF Master Plan, Draft Environmental Impact Report, 2014.

² City of San Francisco, Draft Transportation Demand Management Measures, July 2016, accessed August 2016, http://default.sfplanning.org/plans-and-programs/emerging_issues/tsp/tdm_D2_Appendix_A_TDM_Measures.pdf.

³ Proposed scores refers to the range of point values assigned to each TDM measure under the proposed TDM ordinance.

Table 1 Summary of Optional and Required TDM Strategies

TDM Measure	Draft TDM Score	Sitewide TDM Package Measures (Market Rate and Below Market Rate Housing)	Market Rate Housing TDM Package Measure
Bicycle Parking	1-4	●	
Bicycle Repair Station	1		●
Car Share Parking	1-5	●	
Car Share Membership	1-5		●
Family TDM Amenities	1	●	
On-Site Childcare	2	●	
Contributions or Incentives for Sustainable Transportation	2-8		●
Multimodal Wayfinding Signage	1	●	
Real Time Transportation Information Displays	1		●
Tailored Transportation Marketing Services	1-4	●	
On-Site Affordable Housing	1-4	●	
Unbundle Parking	1-5	●	
Parking Supply	1-11	●	

The TDM Strategies presented in this plan will allow BRIDGE Housing to support the Potrero Hill neighborhood by minimizing new vehicle trips associated with the project compared to a project without TDM. These strategies will also build a better community by improving housing and transportation options and enhancing quality of life, access and walking for low income residents and the wider neighborhood.

As presented in the 2014 Environmental Impact Report, the proposed project without TDM measures will generate 891 vehicle trips during the morning and evening peak periods.

Auto trip reduction data from the California Air Pollution Control Officers Association (CAPCOA)⁴ were used to conduct a Mitigated Trip Demand Analysis to estimate the proportional impacts of this Plan’s TDM measures on vehicular travel to and from the proposed project site. Upon inputting the project’s land use and TDM plan, a 17.3% reduction in vehicle miles traveled was predicted. CAPCOA’s quantification report assumes that average trip lengths are constant⁵ and that therefore percentage trip reduction and percentage miles reduction have a 1:1 relationship. Hence, it is estimated that trips associated with the proposed project would be reduced by 17% with adoption of the TDM measures outlined in this plan. If applied directly to the estimated trip demand, this reduction would result in the proposed project producing no more than 737 peak hour trips.

⁴ “Quantifying Greenhouse Gas Mitigation Measures”, California Air Pollution Control Officers Association, 2010.

⁵ E.g. for each trip purpose, the origins and destinations are unchanged by changes in mode choice.

1 INTRODUCTION

Transportation Demand Management (TDM) is the use of various strategies for reducing demand for travel by single-occupant vehicles.

Travel demand from residential developments is affected by locational and land use factors such as proximity to high quality transit, and the presence of transit supportive land use densities and mixed land use patterns. Travel demand is also affected by programs or features such as reduced parking supply, unbundled parking, financial incentives to using non-auto modes, pedestrian and bicycle design, transportation marketing, rideshare matching, shared vehicles or bikes, emergency ride home, and other related strategies.

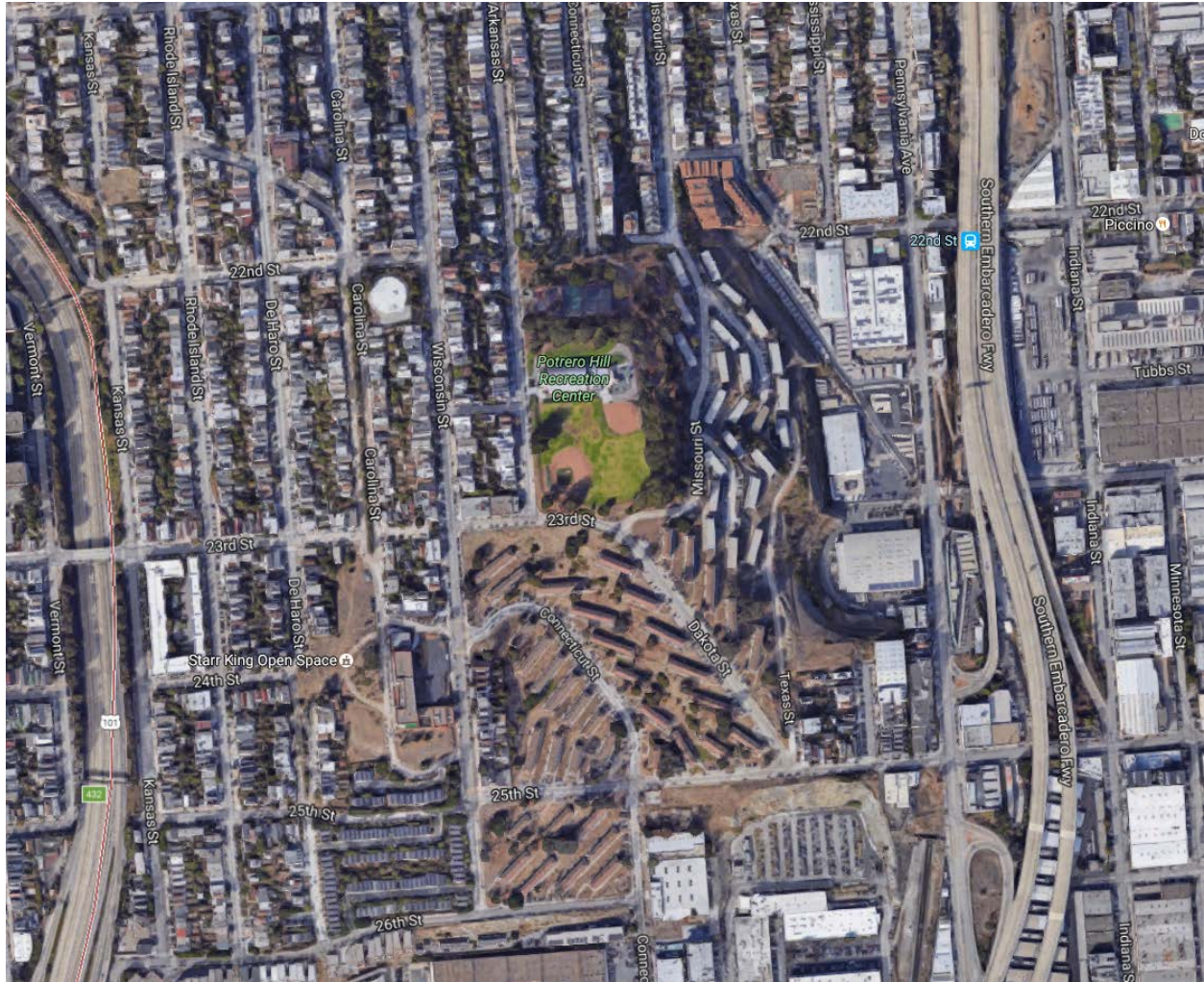
PROJECT DESCRIPTION

BRIDGE Housing is leading the redevelopment of the 38-acre Potrero Terrace and Annex Public Housing Site in the Potrero Hill neighborhood of San Francisco as part of San Francisco's HOPE SF program. The project would replace all existing housing (all existing housing is public housing)⁶ on a one-for-one basis, subsidized with funding from the Mayor's Office of Housing and Community Development, along with other state and federal funds. The development would add approximately 1,000 housing units including 200 additional affordable units and 800 market rate units.⁷ The project would also include community facilities, on-site childcare, retail, open space, and neighborhood programs and services (see Figure 2).

⁶ Fourteen (14) of the existing 620 residential units are currently used as a childcare center and non-profit office space. The redevelopment would replace all the units currently housing public housing residents with new public housing replacement units on a one-for-one basis. Approximately 200 additional affordable housing units will be provided as part of the development.

⁷ Potrero HOPE SF Master Plan, Draft Environmental Impact Report, 2014.

Figure 1 Existing Project Site



Source: Google Maps, accessed October 2016.

The project plans include improvements to the existing transportation network to increase walkability, safety, and access to transit. The street layout which is currently characterized as curvilinear streets with poor connectivity, would be transformed to a grid with north/south and east/west connections to create convenient access within the project site and connectivity to the surrounding neighborhood. Pedestrian safety elements would include bulb-outs, raised crosswalks, pedestrian scale lighting, high quality sidewalks, and other safety elements. Muni Forward will be improving transit access by rerouting three Muni bus lines (10-Townsend, 48-Quintara, 58-24th Street) to better serve the project site, using the refined street network. These improvements would provide direct connections from the site to Downtown, Hunters Point, Bay Area Regional Transit (BART), and the Mission District. Though there is limited bicycle infrastructure planned for the area because of steep, hilly terrain, there would be bike storage available to residents.⁸

⁸ Ibid.

Figure 2 Proposed Site Development



The Potrero Hill development project will include a considerable level of investment in new multimodal infrastructure to support transit and active transportation use by existing and future residents, employees and visitors, as well as the surrounding neighborhood. Most fundamentally, transportation investments include the creation of a new, fine-grained street grid in an area of the City that currently has a poorly connected and disorienting curvilinear street layout. The new street layout and multimodal transportation investments will significantly improve transportation access, connectivity, and legibility at and adjacent to the project site, as well as expand access to transportation, open space, and neighborhood services. The multimodal infrastructure investments will also reinforce the effectiveness of TDM programs in reducing vehicle trips. Figure 3 shows the proposed street, pedestrian, and bicycle connections that are included as part of the project plans.

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Figure 3 Planned Multimodal Infrastructure and Connections



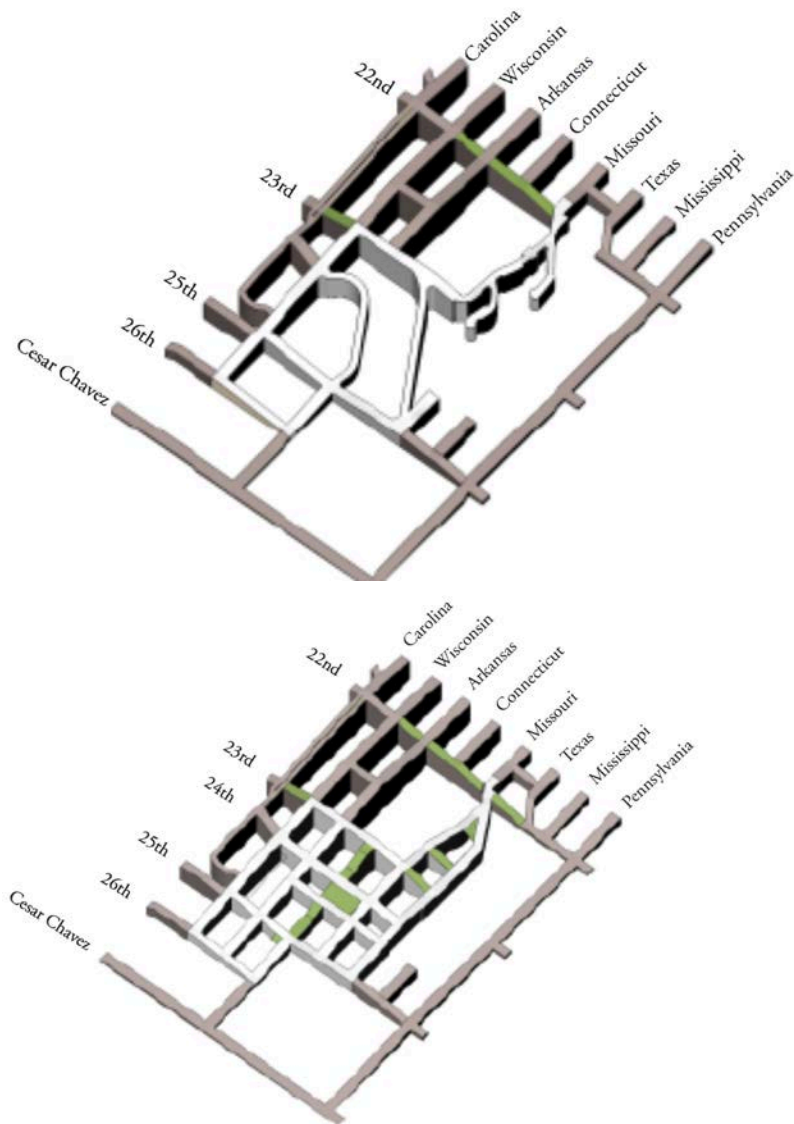
Source: Potrero Hope SF Infrastructure Master Plan

Vehicular Access

The roadway network would include the existing street network and new road connections designed as complete streets to improve connectivity and access to and within the project site. Generally, the lane widths will range from 11 to 12 feet with parking on one or both sides of the street (either as parallel, 90 degree, or angled spaces).

North/south connections would extend the existing streets within the project site to adjacent neighborhoods. Arkansas, Missouri, and Texas Streets are all streets that would be extended to provide strong north/south connections, with Arkansas connecting to 26th Street and Missouri and Texas Streets connecting to 25th Street. Changes to 24th Street would provide strong east/west connections through the project area and would connect Starr King Elementary School to Texas Street. Figure 4 shows the proposed road network and elevations compared to the existing road network (note: green connections are pedestrian pathways).

Figure 4 Existing (top) and Proposed (bottom) Street Network



Pedestrian and Bicycle Infrastructure

The proposed project is required to comply with Design Standards and Guidelines included as an exhibit to the Project's Development Agreement. Pedestrian circulation within the project site would be along existing and new roadways, as well as off-street paths and staircases. Sidewalks would be included along both sides of all interior roadways, with clearly marked crosswalks at intersections; additional pedestrian pathways would be located throughout the site. New staircases would provide connections to open space at the top of the hill, and an open view corridor to the east. Pedestrian crosswalks, raised crosswalks, bulb-outs, and stop controlled intersections would be included throughout the project site and at key intersections that connect the project area to adjacent neighborhoods. The pedestrian facilities would also provide connections to open space, the 22nd Street Caltrain Station, Starr King Elementary School, and other community services. Figure 5 shows the proposed off-street pedestrian facilities.

Bicycle circulation within the project site would be created through the new street configuration. To encourage bicycle trips to and within the development site, establishing high visibility bicycle space may be considered at full build out and in coordination with the City.

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Figure 5 Proposed Off-Street Pedestrian Facilities



CITY POLICIES AND REQUIREMENTS

The City of San Francisco is developing a TDM ordinance that establishes TDM program requirements based on the number of off-street parking spaces that are included in a development. According to the City's Draft TDM requirements, a higher number of TDM points are required for developments that have higher rates of parking provision.⁹ The ordinance includes a Menu of TDM Options from which developers can select. Each TDM option is associated with a number of points that reflects its likely impact on reducing vehicle trips. Developers must implement sufficient TDM Options to satisfy or exceed the points required.

TDM Ordinance

Developments that are 100 % below market rate are exempt from the proposed San Francisco TDM Ordinance.

All market rate developments must comply with the ordinance. For market rate housing, a general formula has been developed to determine the number of points that will be needed based on the amount of off-street parking included in the development. According to the Draft Ordinance, developments with zero (0) to 20 off-street spaces will need to reach 13 points. For every additional 10 off-street parking spaces provided, rounded up to the nearest 10, an additional TDM point would be needed. The target would be capped at the total available points available for the land use. The Draft Ordinance outlines TDM measures and points associated with each measure based on the level of implementation.

Table 2 shows the maximum parking supply for both market rate and affordable developments included in the development, and the estimated number of points each site would need under the Draft TDM Ordinance.

⁹City of San Francisco, Draft Transportation Demand Management Measures, July 2016, accessed August 2016, http://default.sfplanning.org/plans-and-programs/emerging_issues/tsp/tdm_D2_Appendix_A_TDM_Measures.pdf.

Table 2 Estimated TDM Point Requirements for All Phases (Market Rate and Affordable Vertical Developments)

Phase	Block	Parking Spaces	Draft TDM Points Required
1*	X	29	N/A
2	A	102	22
2*	B	47	N/A
3	N	110	22
3	O	100	21
3	P	45	16
3*	Q	28	N/A
3*	R	20	N/A
4*	J2	33	N/A
5A*	J1	20	N/A
5A	K	125	24
5A	L	130	24
5A*	M	60	N/A
5B*	C	50	N/A
5B	F	70	18
5B*	G	30	N/A
5C*	D	50	N/A
5C	E	125	24
5C*	H	30	N/A
Total		1,204	171

Note: Building phases marked with an asterisk will be BRIDGE housing developments and will be 100% affordable.

Special Use District

As part of the entitlements for the development, the project site will be rezoned as the Potrero Hope SF Special Use District. The purpose of a Special Use District (SUD), is to provide an amendment to the Planning Code to establish density, parking, setbacks, and zoning requirements in line with the intended goals of the development. The stated purpose of the Potrero Hope SF SUD is as follows:

Allow a project that will replace the Potrero Terrace and Potrero Annex public housing projects with a mixed-use and mixed-income development of affordable dwelling units in a number in excess of the existing public housing units, market-rate dwelling units, neighborhood commercial and community facility uses, and new infrastructure improvements, including streets, sidewalks, utilities, and open spaces.¹⁰

¹⁰ Section 249: Potrero Home SF Special Use District

DRAFT EIR FINDINGS

The Environmental Impact Report (EIR) for the master plan was certified in December 2015. Based on City Guidelines¹¹, residential trip generation rates for the proposed project were determined to be 7.5 daily person trips per unit for one-bedroom or studio units, 10 daily person trips per unit for two-bedroom or more housing units, 5 daily person trips per unit for senior housing residences, and 150 daily person trips per 1,000 sf of retail development. Pursuant to the Guidelines, residential trip generation rates were assumed to be the same for both market rate and affordable housing units. For the proposed community center, trip generation rates of 1.45 PM peak hour person trips per 1,000 sf and 22.8 daily person trips per 1,000 sf were obtained from the ITE Trip Generation Manual 8th Edition (Land Use Code 495).¹²

In total, the proposed project would generate approximately 12,243 net person-trips (inbound and outbound) on a weekday daily basis and 1,787 net person-trips during the PM peak (from 4:00 p.m. to 6:00 p.m.). Project-generated new person-trips were assigned to travel modes through mode split information obtained from the SF Guidelines for work and non-work related trips to and from Superdistrict 3. During both the weekday AM and PM peak hours, approximately 60% (1,069) of the person-trips generated by the proposed project are assumed to be auto-based, 19% (344 trips) transit-based, and 21% (373) would occur by walk/other modes. The proposed project would result in a total of approximately 891 new vehicle trips during the weekday PM peak hour, of which 575 would be inbound and 316 outbound.

¹¹San Francisco Planning Department, Transportation Impact Analysis Guidelines for Environmental Review, City and County of San Francisco October 2002, Accessed August 2016, http://sf-planning.org/sites/default/files/FileCenter/Documents/6753-Transportation_Impact_Analysis_Guidelines.pdf

¹² Please note that trip generation estimates for the community center were based on a single study site.

2 TDM GOALS

BRIDGE Housing develops housing for low income residents. Beyond providing housing for low-income households, the organization has the following guiding goals that all of its developments strive to achieve:

- Economically integrate neighborhoods.
- Generate economic opportunities for public housing residents.
- Create new main street hubs and hearts of the community with opportunities for informal interaction between neighbors.
- Link low-income families to the services they need.

BRIDGE Housing's Potrero Hill project is part of the City of San Francisco's HOPE SF program, a partnership between the Mayor's Office of Housing and Community Development and the San Francisco Housing Authority aimed at revitalizing distressed public housing developments and increasing the City's supply of affordable housing. To meet the general goals of the program, HOPE SF has identified a robust list of objectives for the project; those that influence the TDM plan are listed below:¹³

- Establish physical and social connections between the Potrero Terrace and Annex Project site and the larger Potrero Hill neighborhood.
- Provide community facilities, including space for on-site services and programs.
- Create a comprehensive services plan to address gaps in service and facilitate access to existing programs and resources.
- Build new safe streets and open spaces.
- Incorporate green and healthy development principles that include green construction and healthy buildings, and a walkable neighborhood.

TDM STRATEGY GOALS

In addition to meeting the goals noted above, the Potrero Hill redevelopment would also strive to create a pedestrian friendly environment that creates a fun and inviting community for residents. The TDM plan will include measures that contribute to the goals shown in Table 3.

¹³ Bridge Housing, Potrero Hope SF Design Standards and Guidelines, February 2015.

Table 3 TDM Guiding Efforts and Goals

TDM Guiding Efforts	TDM Goals
Support access	Promote the diversity of transportation options available and provide resources and incentives to travel to/from the site on sustainable modes
Create community	Create a safe and fun environment that is inviting to all people and modes of transportation at all times of the day. Activate the public realm through urban design features.
Encourage walking	Promote pedestrian safety through lighting and street design e.g. sidewalks, pedestrian-friendly intersections, and bus stop access. Increase connectivity associated with the layout of streets within the neighborhood. Provide high quality and convenient connections to open space.
Be a good neighbor	Reduce traffic congestion associated with the development. Reconnect the site to the wider city street grid. Improve the supply of convenient and direct access to high quality transit, including Caltrain and Muni Light Rail.

TRIP REDUCTION TARGET

The EIR calculated the expected weekday daily and PM peak hour vehicle trips associated with the proposed site. This TDM plan works to achieve a trip target of 15% fewer trips than stated in the EIR. In support of the City’s goals, BRIDGE Housing will strive to exceed this goal and reach a 17% vehicle trip reduction as part of this plan. Table 4 shows the trip estimates presented in the EIR and the 15% reduced target that this TDM plan aims to achieve.

Table 4 Trip Reduction Targets off of EIR Trip Estimates

Period	EIR Trip Estimates	15% Trip Reduction Target
PM Peak Hour Trips (4:00 p.m. – 6:00 p.m.)	891	758

FACTORS FOR SUCCESS

For the TDM plan to be successful, several factors are important.

- The TDM plan leverages substantial investments in transportation infrastructure made by BRIDGE Housing, particularly new pedestrian facilities and improvements to the existing road network. These infrastructure investments will reinforce TDM programs implemented by the developers and property managers.
- The TDM plan is practical and actionable. TDM strategies are operationally and financially realistic, enabling the plan to get “off the shelf”.
- The individual TDM strategies complement each other in a coordinated and synergistic package. The TDM plan is designed with the understanding that each component is needed to maximize trip reductions.
- The TDM plan includes comprehensive parking management strategies that optimize the site's parking supply.
- The TDM plan should be monitored and adjusted to improve performance over time. Likewise, trip reduction goals need to be phased in so that they remain realistic and achievable, and

adjustments should be made to better tailor programs to actual usage and the evolving demographics of the site and transportation options that serve the site.

TDM APPROACH

The project would support larger City goals, objectives, and the San Francisco TDM Ordinance which determines the strength and types of TDM measures that are necessary for developments. This TDM plan supports current project design and transportation components identified in the Public Draft EIR and Rebuild Potrero and complements these transportation improvements. In addition, this TDM plan specifies how demand management strategies can be applied, how they can quantifiably reduce auto traffic demand, and how these strategies can be measured.

BRIDGE Housing will develop and manage all of the below market rate housing sites, however, parcels planned for market rate housing may be developed by third party developers who would plan, develop, and manage these portions of the project.

The Draft TDM Menu of Options was used to guide the development of this TDM plan. Specific elements of the proposed TDM plan will be implemented on a sitewide basis and are presented as a Sitewide TDM Package in Chapter 3. An additional package of TDM measures is presented in Chapter 4; implementation of these measures will be required by all market rate development. The sitewide TDM package includes improvements to the developments' public spaces, communication, and monitoring that will be implemented by BRIDGE Housing, its affiliate, or designated management association. Building-specific measures are also included in the sitewide TDM package and all developments on the site will be required to implement these measures. BRIDGE Housing would implement all of the building specific, sitewide measures for 100% below market rate developments; future market rate developers would be required to implement all sitewide, building specific measures as well as the additional measures included in the Market Rate Development TDM Package. Measures included in both the sitewide and market rate TDM packages will be implemented as buildings are occupied. Table 5 shows the proposed TDM measures and whether the TDM measure is required under the Sitewide TDM Package or the Market Rate Development TDM Package.

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Table 5 Draft TDM Menu of Options for and Required Implementations

TDM Measure	Sitewide TDM Measure	Building Specific, Market Rate Housing TDM Measure
Bicycle Parking	●	
Bicycle Repair Station		●
Car Share Parking	●	
Car Share Membership		●
Family TDM Amenities	●	
On-Site Childcare	●	
Contributions or Incentives for Sustainable Transportation		●
Multimodal Wayfinding Signage	●	
Real Time Transportation Information Displays		●
Tailored Transportation Marketing Services	●	
On-Site Affordable Housing	●	
Unbundle Parking	●	
Parking Supply	●	

3 SITEWIDE TDM PACKAGE

This TDM Package focuses on three overarching strategies: information and marketing, resident services, and parking management. TDM measures outlined in the Sitewide Package apply to all buildings in the development (regardless of their rental rate). In addition to site residents, employees of commercial and community spaces within the development are eligible for all applicable sitewide measures, such as welcome packets, bicycle parking, and car share access.

A package of additional requirements for market rate developers is provided in Chapter 4.

COMMUNICATIONS AND INFORMATION

Effective marketing and management of the TDM programs are essential to their success. If residents, employees, and the general public are unaware of the available transportation options and programs, they will not take advantage of them. Ongoing and tailored marketing efforts will be needed to ensure that programs are well utilized. Similarly, active management of the TDM programs by dedicated staff is needed to implement, tailor, and refine the programs and services to best meet the needs of the community.

Tailored Transportation Marketing

Information on transportation options and/or links to the appropriate website and/or app will be distributed to all prospective residential tenants and all prospective employees who receive an offer to work within the development. It will also be included as a component of resident and employee welcome packets or employee orientation. Furthermore, information and/or links will be posted in prominent locations for all residents and employees, such as apartment lobbies, bus stops, and/or lunchrooms.

In accordance with the San Francisco Transportation Demand Management Measures, the development project shall provide individualized, tailored marketing and communication campaigns to encourage the use of sustainable transportation modes. Marketing services will be provided by the TDM Coordinator and will include:

1. **Promotions.** The TDM coordinator shall develop and deploy promotions to encourage use of sustainable transportation modes. This includes targeted messaging and communication campaigns, incentives and contests, and other creative strategies.
2. **Welcome Packets.** New residents and employees shall be provided with tailored marketing information about sustainable transportation options associated with accessing the project site (e.g., specific transit routes and schedules; bicycle routes; carpooling programs, etc.) as part of the welcome packet. For employees, the packet should reflect options for major commute origins. New residents and employees shall also be offered the opportunity for a one-on-one consultation about their transportation options.

TDM Coordinator

Transportation Coordinators implement TDM strategies and oversee the management and marketing of TDM programs. Additionally, the TDM Coordinator will oversee the monitoring and reporting of the TDM Program at the Potrero Hill site.

BRIDGE Housing, its affiliate, or designated management association, will hire an outside consultant to serve as the Transportation Coordinator for the entire development. The role of this position will be to coordinate all transportation communication, to implement TDM programs, and to comply with compliance monitoring and reporting requirements for the entire site (both market rate and affordable developments). Because the proposed development is planned to develop in multiple stages, this position will scale overtime to reflect the Potrero Hill Development's occupancy and will exist for the lifetime of the project.

Below is an overview of possible information distribution approaches that may be considered by the sitewide TDM Coordinator.

Resident and Employee Guide

At initial lease signing or renewal (for dwelling units) and upon hire (for non-residential development) an up-to-date transportation reference guide will be distributed either in print or electronically to all new residents and employees; updates to the handbook will be provided as service changes occur. This information should also be posted on the development site website. The handbook should include the following information:

- Transportation Coordinator contact information
- Commute trip planning information, including application information for relevant ride matching or dynamic carpool services (e.g. MTC ride matching program, Lyft carpool pilot program, etc.)
- Local transit options and schedules, including links to Muni and Caltrain schedules/route maps and the online BART schedule and trip planner app

Information distributed to Below Market Rate residential units will also include information on eligibility requirements and required forms for Muni discount passes including lifeline passes, low-income monthly passes, and free Muni for youth/senior passes.

Website (initial) and Smartphone App (long-term)

Creating a website or smartphone app that serves as a comprehensive source of transportation and TDM information has proven highly effective in raising awareness of alternatives to drive-alone mobility and commute options. Such tools can provide specific information on costs, benefits, and multimodal options available to employees and residents as well as links to citywide or regional information. Figure 6 on the following page provides an example of these types of websites.

Depending on financial feasibility, a smartphone app or other web based information services may be considered by BRIDGE Housing to provide transportation information for local and regional transportation options.

Figure 6 Example of Transportation Website (Mountain View)



www.mvgo.org

Wayfinding

Providing signage or intrinsic wayfinding to direct people to nearby services, access routes, and non-driving transportation options makes the surrounding area more navigable. Establishing a wayfinding system throughout the project site, or near key access points, provides clear directions to key destinations and encourages the use of active or public transportation modes for short trips. In accordance with the San Francisco Transportation Demand Management Measures, the development project shall provide multimodal wayfinding signage in key locations to support access to transportation services and infrastructure, including:

- Transit;
- Bike share;
- Carshare parking;
- Bicycle parking and amenities;
- Showers and lockers;
- Taxi stands; and
- Shuttle/carpool/vanpool pick-up/drop-off locations.

As the master developer, BRIDGE Housing will establish wayfinding to key destinations within the project site, such as the main corridor along 24th Street, and nearby transit stops. Wayfinding may include intrinsic wayfinding provided by view sheds of locations (such as the Bay) or destinations such as bus stops or train stations.

RESIDENT SERVICES

This section describes the TDM measures and policies that BRIDGE Housing will require to be implemented as part of the development of the project site. Since some of these measures will require coordination with and input from the City of San Francisco and future tenants; the exact parameters of a given measure may evolve over time or be determined at a later time.

Vehicle Sharing

Car sharing programs allow people to have on-demand access to a shared fleet of vehicles on an as-needed basis. Car sharing has been shown to significantly reduce vehicle ownership and vehicle miles traveled (VMT). Making these vehicles accessible to residents increases the vehicle availability for non-car owners, and reduces the need for households to own more than one vehicle.

A Transit Cooperative Research Program (TCRP) publication “Car-Sharing: Where and How it Succeeds” provided a comprehensive evaluation of the effects of car sharing programs throughout the U.S. and importantly, the effects on users of such programs. The empirical study findings indicated that on average, about 20% of car sharing members give up their car (or a second or third vehicle) and about 40% of members forego purchasing a new car. The report also discusses the financial incentives or cost savings for developers by installing car share parking spaces. While the study results may reflect some self-selection bias, providing car share parking spaces can reduce the overall need for parking spaces and reduce the overall project operating and maintenance costs. Fewer parking spaces also results in lower trip generation and traffic impacts on the surrounding neighborhood. Cost savings to developers can be reallocated to an investment in car sharing and related membership for future residents and businesses on the property.¹⁴

Two potential car share operators are City CarShare¹⁵ and Zipcar¹⁶. Scoot¹⁷ is another potential operator and provides flexible electric motor scooter share in the Bay Area. Other car share services, such as point-to-point (such as car2go) or peer-to-peer (such as Getaround), are also opportunities to reduce residents’ need for private vehicles. These services would be offered by a private vendor.

The project is required to meet a car share ratio of one (1) car share parking space for every 80 dwelling units, and one (1) car share space for each 20,000 square feet of occupied retail space. Car share may be located in both on- and off-street parking spaces to increase their visibility and access with supply aggregated instead of assigned to each individual building. Car share parking spaces may be placed in priority parking areas (on-street spaces close to entrances). If peer-to-peer programs are pursued, priority parking for participating shared vehicles should be considered, as well. Additionally, this program should maintain flexibility to increase the number of vehicles as development occurs and demand shifts.

Bicycle Parking

Making non-recreation trips of any purpose by bike can reduce household costs and improve health outcomes. However, purchasing a bike can be a significant financial investment for many. As such, even a small chance of theft can reduce bicycle trips when all parking options leave bikes exposed to the

¹⁴ Transportation Cooperative Research Program (TCRP) Report 108, *Car-Sharing: Where and How it Succeeds*, 2005.

¹⁵ www.citycarshare.org

¹⁶ www.zipcar.com

¹⁷ <https://scoot.co/>

elements. Secure parking, bicycle lockers, and in-unit bicycle nooks (Class 2) offer more protection from theft and vandalism when compared to standard bicycle racks (Class 1).

In addition to the provisions above, vertical developments that include retail or commercial space shall provide one (1) Class 1 space for every 3,750 square feet of occupied retail space. All Class 1 spaces provided for retail uses shall be made publically available at well-lit, highly visible, and conveniently located retail or community destinations to promote bicycle use by visitors. Developments that include retail will also provide one (1) Class 2 space for every 750 square feet of occupied retail space; or five percent of the maximum number of visitors which the project is designed to accommodate, whichever is less. Provisions shall be made that a share of Class 2 spaces are located within a reasonable distance of electrical outlets to allow for charging of e-bikes.

The Special Use District (SUD) and the Development Agreement will govern the number of bicycle parking spaces required at the project site. Per the parameters of the SUD, buildings containing 100 or fewer dwelling units shall provide one (1) Class 1 bicycle parking space for every two (2) units. Buildings containing more than 100 dwelling units shall provide 50 Class 1 spaces plus one (1) Class 1 space for every eight (8) dwelling units over 100, and one (1) Class 2 space for every 20 dwelling units.

Family TDM Amenities

All vertical developers shall provide a secure location for storage of personal car seats, strollers, and cargo bicycles or other large bicycles at all buildings on the site. Secure personal car seat storage should be located adjacent to off-street car share parking space(s).

On-site Childcare

On-site childcare facilities can reduce commuting distances between households, places of employment, and childcare. As the master developer, BRIDGE Housing will provide an on-site childcare facility as part of the Master Plan.

On-site Affordable Housing

Research indicates that affordable housing units generate fewer trips than market rate housing units. Affordable housing requirements for the overall site shall be met by BRIDGE Housing through the provision of affordable units as stated in the Project Description and Developer Agreement.

PARKING MANAGEMENT

Automobile parking is necessary for the successful development of the project. However, too much parking causes higher rates of traffic and safety risks, undermines other TDM strategies, increases project costs, and negatively impacts walkable and aesthetically pleasing site design. Finding the right balance needed to support the City's goals is critical, particularly given that parking is an expensive resource to provide. The role of parking and parking management is also a key element to helping the Potrero Hill Development reduce vehicle trips. If free and unregulated parking is provided, there is little incentive for many residents to use alternative modes of transportation.

The parking management strategies presented are designed to help ensure that there are enough parking spaces to support functioning of the site, while not providing more parking than necessary. Balancing these factors will help achieve trip reduction goals, reduce development costs, and support the success of a pedestrian-friendly environment.

Parking Supply

The Special Use District (SUD) and the Development Agreement will govern the number of parking spaces required at the project site. Per the parameters of the SUD, there is no minimum off-street parking requirement for any use in the district. Upon completion of the Project, the number of off-street parking spaces within the SUD shall not exceed: one parking space per market rate residential dwelling unit; plus one parking space per 500 square feet of occupied commercial, institutional, and community facility space.

BRIDGE Housing will provide a maximum parking ratio of 0.5 off-street parking for all affordable housing units. Market rate developments will provide a maximum of 0.75 parking spaces for every one market rate residential unit. Parking supply may be aggregated though total will not exceed these maximums.

Unbundled Parking for Residents

Parking construction and operating costs are generally subsumed into the price of housing. Although the cost of parking is often hidden in this way, parking is never free. Instead, the cost to construct and maintain the “free” parking is included in the cost to buy or rent housing.

The SUD requires all spaces be unbundled and sold or rented separately.

The unbundled parking policy provides a financial incentive to residents to use only the amount of parking they need. For residential development, unbundled parking may prompt some residents to dispense with one of their cars and to make more of their trips by other modes. Among households with below-average vehicle ownership rates (e.g., low-income households, students, singles, seniors, etc.), unbundled parking can also provide a substantial financial benefit that increases housing affordability.

With adequate on-street parking proposed for the project, this program may require restricting on-street parking during certain hours.

BRIDGE Housing will require that all off-street parking spaces be unbundled and require that each space be rented separately.¹⁸

¹⁸ Rental rates for unbundled parking in affordable housing developments will be governed by the regulations imposed by financing sources, including those imposed by the California Tax Credit Allocation Committee.

4 MARKET RATE TDM PACKAGE

Market rate developments built on the project site are required to comply with all of the TDM measures included in this section, in addition to any building specific measures included in the sitewide TDM measures listed in Chapter 3. In meeting this agreement, future market rate developers will be in compliance with the City's TDM Ordinance. In coordination with the City, the measures outlined within this package may be conditionally substituted if the developer can demonstrate that alternative measures would result in a comparable reduction in vehicle trips. Although the following measures are not required for BRIDGE Housing as affordable housing developer, BRIDGE Housing will make efforts to include these measures in all affordable developments, contingent on the availability of subsidies of operating budgets.

INFORMATION AND MARKETING

Resident Guide

In addition to the items covered in the resident and employee guide required under the Sitewide TDM Package (see Chapter 3), handbooks for market rate residents shall include the following information:

- Subsidies or financial incentives provided through the TDM program, and instructions on how to access them, forms, etc.

Real Time Transportation Information

Market rate developers shall provide real time transportation information on displays (e.g., large television screens or computer monitors) in prominent locations (e.g., entry/exit areas, lobbies, elevator bays) on the project site to highlight sustainable transportation options and support informed trip-making. At minimum, screens should be provided at each major entry/exit.

The displays shall include real time information on sustainable transportation options in the vicinity of the project site, which may include, but are not limited to, transit arrivals and departures for nearby transit routes, walking times to those locations, and the availability of car share vehicles, shared bicycles, and shared scooters.

RESIDENT SERVICES

Contributions or Incentives for Sustainable Transportation

Market rate developers shall offer contributions of no less than 50% of a year's cost of a Muni "M" pass for sustainable transportation options to each dwelling unit and/or employee, at least once annually, for the life of the project. Contributions will be provided in the form of untaxed e-cash loaded onto a Clipper Card. The percent contribution shall be increased annually to reflect the two-year average consumer price

index change for the San Francisco/San Jose Primary Metropolitan Statistical Area or the change in the cost of a monthly Muni only “M” pass, whichever is less. In addition, the property owner may consider providing contributions for TNC credits to subsidize shared rides such as Lyft Line and uberPOOL to transit stations.

Bike Repair Station

Providing basic tools for keeping bikes in good working order can encourage commuters to try biking to work, and keep them riding. Under the parameters of the TDM Ordinance, each market rate developer shall provide at minimum one (1) bicycle repair station consisting of a designated, secure area within a building, such as a bicycle storage room or parking garage, where bicycle maintenance tools and supplies are readily available on a permanent basis. Tools and supplies should include, at minimum, those necessary for fixing a flat tire, adjusting a chain, and performing other basic bicycle maintenance. Other available tools should include a bicycle pump, wrenches, a chain tool, lubricants, tire levers, hex keys/Allen wrenches, torx keys, screwdrivers, and spoke wrenches.

Vehicle Share Memberships

In addition to meeting the requirement for providing vehicle share parking included in the sitewide TDM package (see Chapter 3), market rate developers shall provide fully subsidized car share memberships on a one-to-one basis per dwelling unit, as outline in the TDM Ordinance. Memberships should be offered at least once annually to each dwelling unit and/or employee for the life of the project. The cost of the membership shall be determined at the time of project approval and increased annually to reflect the two-year average consumer price index change for the San Francisco/San Jose Primary Metropolitan Statistical Area or the change in the cost of the membership, whichever is less. Residents and/or employees shall pay all other costs associated with car share usage, including hourly fees.

PARKING MANGANGEMENT

In addition to the unbundled parking requirements included in the sitewide TDM package (see Chapter 3) future market rate developers will also provide options for tenants to pay an additional fee for designated/reserved parking spaces. Additionally, the unbundling of parking spaces in market rate developments will be implemented as follows:

- Spaces shall be leased not sold. Month-to-month leases provide flexibility for residents and property owners.
- Leasing rates will be adjusted as needed to manage parking demand. Prices will reflect the market for parking and be used to restrict demand to available supply.
- Where there are fewer parking spaces than units, the parking spaces shall be offered to the potential buyers or renters of the units with more bedrooms first.
- Surplus spaces may be rented out to non-residents or non-tenants with the provision that such spaces must be vacated on 30-day notice if they become needed as determined by individual property managers.

Any inclusionary affordable units located in market rate developments will be required to unbundle parking for these units and rent these spaces at a reduced rate that reflects the reduction ratio of rents between affordable and market rate units.¹⁹

¹⁹ Section 167 of the San Francisco Planning Code

5 TRIP REDUCTION ANALYSIS

There are challenges inherent in trying to estimate the effects of any one TDM investment. While research on vehicle trip reduction strategies often attempts to isolate the stand-alone effects of implementing such policies and programs to understand the actual relationship between specific strategies and travel behavior, it is difficult to isolate these effects. In practice, TDM measures are implemented concurrently, as they are synergistic.

This TDM plan includes a variety of measures that have been researched by the California Air Pollution Control Officers Association (CAPCOA). In a 2010 report, CAPCOA presents a way to quantify the total impact of different strategies implemented together in various areas and communities throughout the country. The CAPCOA report is based on an extensive literature review of the effectiveness of TDM and other GHG-reduction strategies implemented across the US, and provides clear guidance on the assumptions and limitations of each measure.

Other TDM measures included in this Plan do not have quantified trip reduction estimates, though they have been included in the San Francisco TDM Ordinance Menu of Options. While no trip reduction credit is included in the calculations, these measures are therefore expected to further reduce vehicle trips associated with residential developments in the City of San Francisco.

TDM strategies are not additive but rather complementary and synergistic. When additional measures are implemented, the marginal benefit of each new program diminishes because the baseline it is working from has already been reduced by prior strategies. This means that if one implements 11 strategies, with each estimated to reduce trip-making by 10%, one would not expect a 110% overall reduction in trip-making (rather, it would be 69%, see methodology below). To prevent this kind of result, the CAPCOA methodology includes maximum reduction levels associated with each category of strategies, based on existing research. For example, parking policy and pricing strategies can achieve a maximum reduction of 20%. This is separate from the impact of other TDM strategies, which can achieve a combined maximum reduction of 15%.

In general, the calculation is as follows²⁰:

$$\text{Trip Reduction Estimate} = 1 - (1 - \text{Parking Reduction}) * (1 - \text{Other TDM Reduction})$$

Multiple trip reduction components are calculated in a similar way. For instance:

$$\text{Trip Reduction Estimate} = 1 - (1 - \text{Strategy \#1 Reduction}) * (1 - \text{Strategy \#2 Reduction}) * \dots\text{etc}$$

²⁰ For further explanation of the other variable involved in trip reduction calculations, please refer to Chart 6-2 of the CAPCOA Quantifying Greenhouse Gas Mitigation Measures Handbook, August 2010. Attached in Appendix.

Although the difference between this approach and a simple additive method is small, it has larger implications as the scale of the project increases. In addition, implementation of these strategies is often staggered, complicating the estimation of when these trip reduction strategies fully take effect.

Table 6 provides a summary of the potential range of reductions in trips associated with each of the TDM measures included in this plan. Our analysis tailored these measures to the proposed project land uses, and surrounding land use and transportation context.

Table 6 Potential Trip Reduction based on CAPCOA

TDM Measure	Estimated Trip Reduction Range
Bicycle Parking	<1%
Bicycle Repair Station	<i>No available data, this measure was not evaluated</i>
Car Share Parking	1% - 5%
Car Share Membership	0.4% - 0.7%
Family TDM Amenities	<i>No available data, this measure was not evaluated</i>
On-Site Childcare	A mix of land uses can result in up to 30% trip reduction.
Contributions or Incentives for Sustainable Transportation	0.3% - 20%
Multimodal Wayfinding Signage	<i>No available data, this measure was not evaluated</i>
Real Time Transportation Information Displays	Included in Marketing Services
Tailored Transportation Marketing Services	0.8% - 2%
On-Site Affordable Housing	0% - 4%
Unbundle Parking	2.6% - 13%
Parking Supply	<20% reduction (dependent on properly managed on-street parking supply)

The measures included in both the sitewide and market rate TDM packages will be implemented at the time each building is completed and will be scaled with the project. Though the Potrero Hill Development has a stated 15% vehicle trip reduction target, BRIDGE Housing, its affiliate, or designated management association will strive to achieve a 17% vehicle trip reduction through the implementation of this TDM plan.

6 MONITORING

A robust monitoring program is key to the success of the project's TDM Program. Monitoring allows the City of San Francisco and BRIDGE Housing to specifically determine trip reductions and qualitatively assess how the programs offered are meeting the needs of residents and employees. The Potrero Hill Development is planned to be constructed in five phases. Phases 1 and 2, located at the southern end of the site, will include approximately 266 residential units; Phase 3 located at the northern end of the site and adjacent to the Potrero Rec Center will include 350 dwelling units; and Phases 4 and 5 which together comprise the major phase of development connecting the earlier phases to the south and north, will include approximately 1,000 dwelling units. As stated, at full build out, the site has a target of achieving a 15% PM peak hour (4:00 PM – 6:00 PM) vehicle trip reduction from EIR. Table 7 provides the estimated number of trips based on EIR for each phase, as well as target number of trips for each phase based on a 15% reduction. Compliance of this TDM Plan is defined as achieving no more than 5% greater than the trip maximum during the first survey after project completion (795 PM peak period auto trips) and reducing that to the 15% target by the second survey after project completion (757 trips).

Table 7 Compliance Target

Phase	Planned Units to be Completed Per Phase	Cumulative Planned Units Completed	Percent Complete	EIR Trip Estimates	Trip Cap (15% Trip Reduction Target)	Threshold of Compliance
Phase 1 and 2	266	266	16%	147	125	N/A
Phase 3	350	616	38%	340	289	N/A
Phase 4 and 5	1,000	1,616	100%	891	757	795

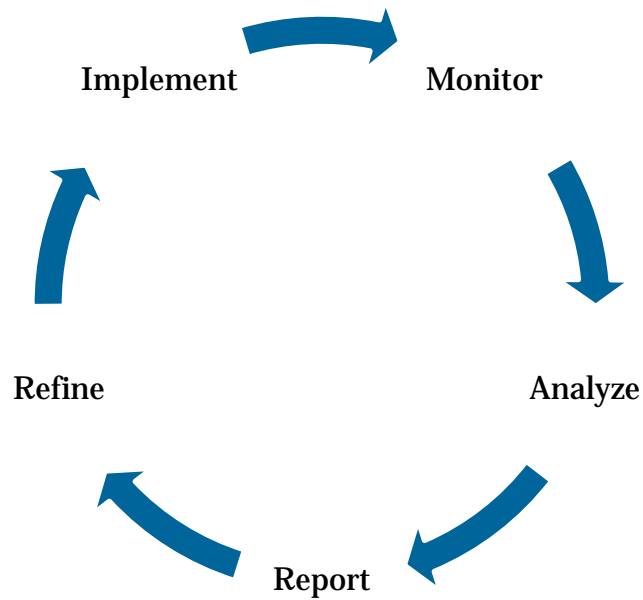
The objectives of the annual monitoring program are:

- To measure progress towards achieving, or retaining, compliance with the Plan goals to reduce automobile trips, enhance resident experience, and build community; and
- To identify the most and least effective TDM strategies, so that the former can be strengthened and the latter can be replaced or significantly improved.

Ongoing monitoring by the TDM Coordinator will enable the City of San Francisco and BRIDGE Housing to determine if the effectiveness of the program is growing over time or if adjustments are needed to improve the performance of the TDM program.

MONITORING APPROACH AND PROCESS

The recommended monitoring approach and process for the project is illustrated below:



Monitoring Plan

BRIDGE Housing, via the TDM Coordinator, will develop a data collection plan for traffic/bike/pedestrian counts, parking occupancy surveys, and an employee/resident survey. These materials will be updated according to City documentation, and will facilitate consistent data collection and analysis over the life of the project.

Monitoring of travel behaviors on site will begin within 18 months of completion of Phase 2 of the Potrero Hill Development, after which monitoring will occur on an annual basis as outlined below. BRIDGE Housing, its affiliate, or designated management company, provides the City the right to collect supplemental data on development and/or community activity with coordination with BRIDGE Housing and the site Coordinator.

Data should be collected over a one-week period during the fall or spring during a “typical week”—one in which there are no holidays, major events, or inclement weather. Data collection should be done during the same month each year. The following data will be collected per City standards:

- Information on TDM program implementation as required by the San Francisco TDM Ordinance;
- Vehicle traffic counts at all entry and exit points to the site during the morning and evening peak-hours;
- Sampling counts to determine automobile occupancies and carpool rates;
- Bicycle and pedestrian counts along key facilities or at gateways;
- Parking occupancy for public and private, on- and off-street facilities; and
- Resident and employee travel and TDM surveys will be conducted every two years, through hard copy, web-based, and/or intercept survey methods that work with the needs of the residents. The TDM Coordinator will make sure the survey is distributed to all residents and employees, with a goal of a 60% response rate.

The TDM Coordinator will be responsible for overseeing this effort and reporting results to the SFMTA and OEWD. The monitoring and reporting schedule is outlined below²¹:

- Within 30 days of the 18-month anniversary of the issuance of the Certificate of Occupancy of the 850th unit constructed on site, upon which the Project will be 50% complete;
- Annually, following the initial report listed above; and
- One submittal every three years, if the project is in good standing and has met all reporting requirements for five consecutive years.
- If any report demonstrates that the project exceeds its trip cap, the project must:
 - Work with the City to develop an actionable plan that revises its approach to TDM
 - Implement the revised TDM plan
 - Return to annual reporting until it has demonstrated compliance for five consecutive years

Data Analysis

The TDM Coordinator will analyze the data collected to measure the following metrics and following City standards:

- Peak hour vehicle traffic counts compared with the peak-hour baseline trip generation for residential and non-residential land uses;
- Employee and resident mode split;
- Participation rates in TDM programs and services;
- Parking utilization throughout the day at public/private on- and off-street facilities;
- Vehicle ownership for residential land uses;
- TDM program awareness; and
- Cost-effectiveness of the TDM program.

In monitoring project-related vehicle trips, it is strongly recommended that the monitoring program evaluate the site's trips in the aggregate, and not try to differentiate trip type. From a practical perspective, trying to monitor "commercial" or "residential" trips will likely prove problematic. The surveys would provide a more appropriate method by which to determine mode split and travel behavior by user group or specific building/tenant.

In addition, the data collection and analysis process will enable BRIDGE Housing or a future management association to gather more qualitative data, such as employee and resident feedback on what programs they are using, what is working well, and how programs can be improved.

The data can be analyzed and cross-referenced to derive information such as by what mode employees and residents of the project travel for various trip purposes; the frequency of travel by a mode other than the single-occupant-vehicle; or which TDM services employees and residents use and why (and vice versa). This data can be further cross-referenced with demographic data to classify travel characteristics by personal and household characteristics such as occupation, income, vehicle ownership, vehicle availability, place of residence, and household size. Cross-referencing is valuable in targeting specific groups with programs designed to meet their needs.

²¹ San Francisco Municipal Transportation Agency, *DRAFT Standards for the Transportation Demand Management Program*, July 2016.

Refine and Implement

As needed, and based on the trip generation and travel behavior findings, an annual detailed refinement plan may be developed to identify how to improve performance of the program so as to reasonably meet program goals. The refinement plan may include detailed implementation steps for program refinements, including required actions and timelines for property owners, businesses, tenants, and residential associations, as appropriate.

At this time, it is not possible or prudent to define exactly how the program can and should be revised if vehicle trips are not reasonably reduced. Refinements to the TDM plan will need to be developed based on trip counts, survey data, and detailed information regarding travel behavior of residents, employees, and visitors. Potential revisions to the TDM plan could include:

- Increased financial subsidies for transit, biking, walking, or ridesharing and/or direct financial payments to reduce single-occupancy vehicle trips;
- Improved and diversified parking management, including increasing parking fees;
- Enhanced marketing and promotion of TDM programs;
- Expanded car sharing services;
- Additional investment in transit, biking, and walking infrastructure;
- Increased on-site TDM staffing levels;
- Administrative changes to ensure that programs are as user-friendly as possible to use; and/or
- Other measures or application of technological advances determined to be appropriate by BRIDGE Housing or future property management, and the City.



POTRERO HOPE SF | MASTER INFRASTRUCTURE PLAN

August 19, 2016

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POTRERO HILL HOPE SF | MASTER INFRASTRUCTURE PLAN

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Figure 1.1 3D Rendering

1. INTRODUCTION / PROJECT DESCRIPTION

1.1 Purpose

This Master Infrastructure Plan (MIP) serves as an exhibit to the Development Agreement (DA) between BRIDGE Housing or its Assignees (Developer) and City and County of San Francisco (City). The DA outlines the infrastructure responsibilities of the City and the Developer. This Master Infrastructure Plan defines the site and infrastructure improvements required to construct the Potrero Hope SF Master Plan (Project), including Environmental Remediation, Demolition, Grading, Street and Transportation Improvements, Open Space and Park Improvements, Potable Water System, Combined Sewer System, Stormwater Management System, and Dry Joint Utility System, as well as associated responsible parties in charge of implementing and operating the improvements. The Inclusion of the MIP as an exhibit to the executed DA constitutes the vetting of the MIP by the various City departments responsible for approving elements of the design and construction of the Project Infrastructure. The area encompassing these infrastructure improvements consists of approximately 38-acres on the south side of Potrero Hill including the San Francisco Housing Authority Potrero Terrance and Annex parcels and the surrounding streets.

The overall project description, location, proposed street and open space designs and the nature of the development within the Potrero HOPE SF site are described fully in the *Potrero HOPE SF Design Standards and Guidelines* (Potrero DSG). The definitions of development-related terms as defined in the DA shall apply to this Master Infrastructure Plan.

1.2 Land Use Program for the infrastructure Plan

Anticipated land uses at the Potrero Hope SF Master Plan include up to 1,700 residential units, approximately 15,000 square feet of retail space and approximately 30,000 square feet of community-serving use. These land use plan numbers have been used to develop utility demands. Although, the land use plan may be adjusted in the future, subsequent to the applicable planning process, in order to implement the project. Refer to Figure 1.3 for proposed site parcelization.

1.3 Master Infrastructure Plan Overview

This Master Infrastructure Plan will govern the construction and development of infrastructure in the Hope SF Master Plan Site and off-site work needed to support the proposed development project.



Figure 1.2 Site Plan

1.4 Property Acquisition, Dedication, and Easements

The mapping, street vacations, property acquisition, dedication and acceptance of streets and other infrastructure improvements will occur through the Subdivision Mapping process. Except as otherwise noted, infrastructure described in this Master Infrastructure Plan shall be constructed within the public right-of-way or dedicated easements to provide for access and maintenance of infrastructure facilities.

Public service easements will be allowed within the Potrero Hope SF Master Plan Site as necessary to provide infrastructure and services to the Project. Proposed public water, wastewater, and power easements benefitting the SFPUC on private property will be reviewed on a case-by-case basis. Full access for vehicles and equipment for the maintenance and repair of utility mains is required. Restrictions to surface improvements in access easements will be defined in the review of the improvements for the parks and adjacent rights-of-way, in future easements, or in other interagency agreements. Public utilities within easements will be installed in accordance with the standards in this Master Infrastructure Plan and applicable City regulations for public acquisition and acceptance within public utility easement areas, including provisions for maintenance access; however, such areas shall not be required to be dedicated as public right-of-ways or improved to public right-of-way standards.

1.5 Project Datum

All elevations referred to herein are based on the City of San Francisco datum.

1.6 Conformance with EIR & Entitlements

This Master Infrastructure Plan has been developed to be consistent with project mitigation measures required by the Environmental Impact Report (EIR) and other entitlement documents. Regardless of the status of their inclusion in this Master Infrastructure Plan, mitigation measures of the EIR shall apply to the Project. Applicable sound and vibration studies required by the EIR will be completed during the approval process for each individual development block or parcel.

1.7 Applicability of Uniform Codes and Infrastructure Standards

Future modifications to City Standards, Guidelines, and Codes are subject to the requirements of the DA. The project shall adhere to the 2015 Subdivision Regulations or obtain an exception or design modification.

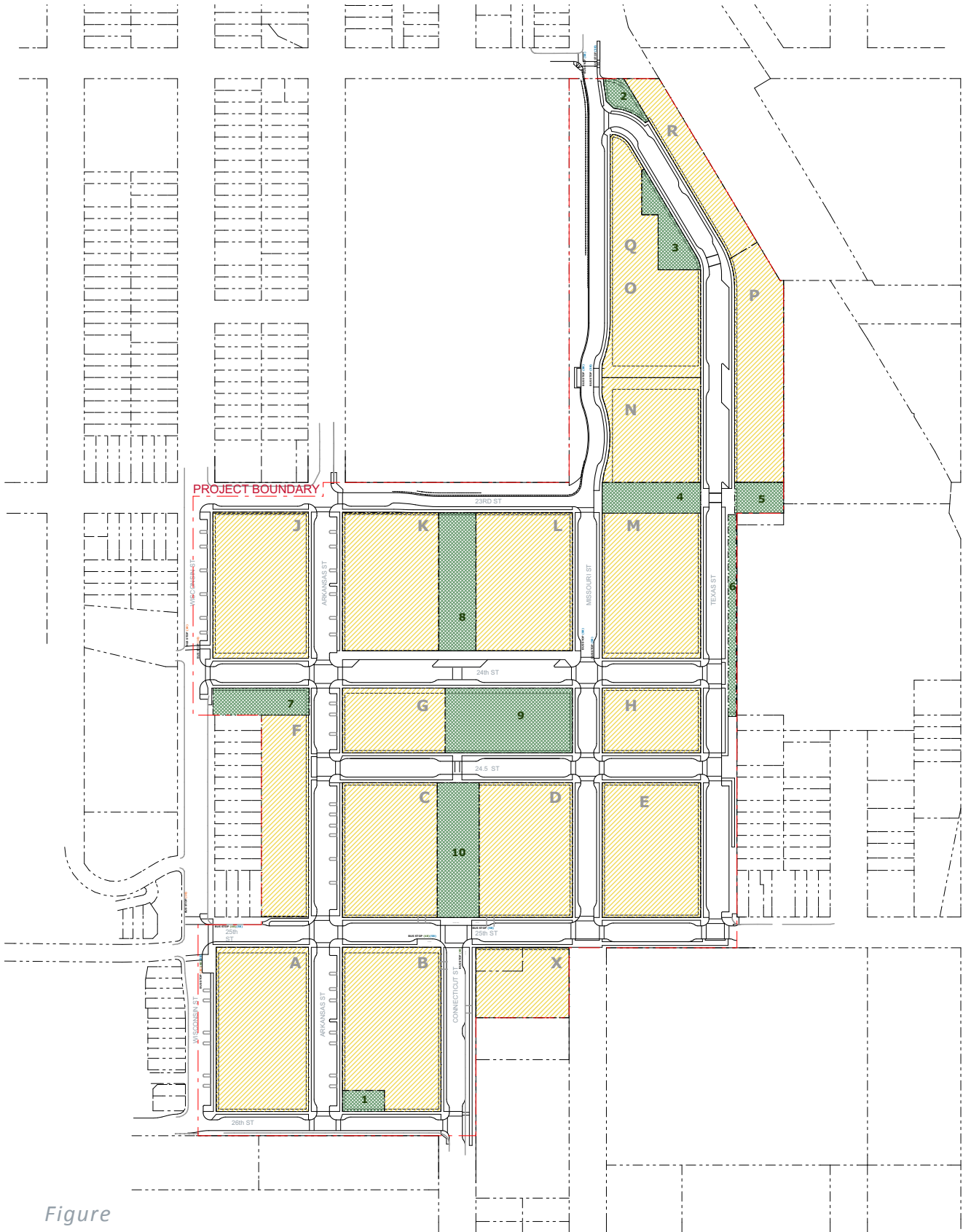


Figure 1.3 Block Diagram
 (Open Space #1 may be located at illustrated location or 25th and Connecticut Street)

1.8 Project Phasing

It is anticipated that the Potrero Hope SF Master Plan will be developed in several phases. Each phase will be further divided into development blocks (Blocks) and parcels. The Developer shall indicate the phase limits upon submittal of each Phase Application, as further defined in the DA. Phase Applications will include a brief description of the infrastructure required to serve the proposed development phase and existing adjacent development. The Developer may submit Phase Applications, for one or more Blocks, that would include a description of utilities and transportation improvements planned for each phase and shall correspond to improvements to be provided with the applicable subdivision map. The information provided with each Phase Application will be consistent with the procedures outlined in the project DA. Developer will complete horizontal development, vertical development may be completed by other developers.

1.9 Phases of Infrastructure Construction

The Developer will design and install the new infrastructure in advance or to match the construction build out phasing of the Project and to serve the Blocks. The extent of the proposed infrastructure installation within each Block will be based on an "adjacency" principle. Adjacency, or adjacent infrastructure, refers to infrastructure that is near to and may share a common border or end point with a Block but is not necessarily immediately adjoining or contiguous with a Block, and represents the minimum necessary to serve the Block and to consolidate or minimize disruptions to the surrounding neighborhood. The infrastructure required for each Block will connect to the existing infrastructure systems as close to the edge of the proposed Block as possible with permanent and/or temporary systems while maintaining the integrity of the existing system for the remainder of the Potrero Hope SF Master Plan Site. The conceptual limits of the existing infrastructure to be demolished as well as conceptual layouts of the permanent and/or temporary infrastructure systems for each Block will be provided as part of the construction document submittals for that Block or Phase. Repairs and/or replacement of the existing facilities necessary to serve the Block will be designed and constructed by the Developer.

The City will be responsible for maintenance of proposed public infrastructure installed by the Developer once construction of the new infrastructure is complete and accepted by San Francisco Public Works (SFPD), the San Francisco Department of Recreation and Parks (SFDRP), the SFMTA, or the SFPUC, except as otherwise specified in the DA. At all phases of development prior to full build out, the Developer shall demonstrate to the SFPUC that a functioning water and wastewater infrastructure system is in place at all times and complies with all City laws, codes and regulations. In addition, the Developer is responsible for maintaining a safe flow path for the 100-year storm at all times during the development. Future documentation submittal requirements are outlined in section 14 of this document.

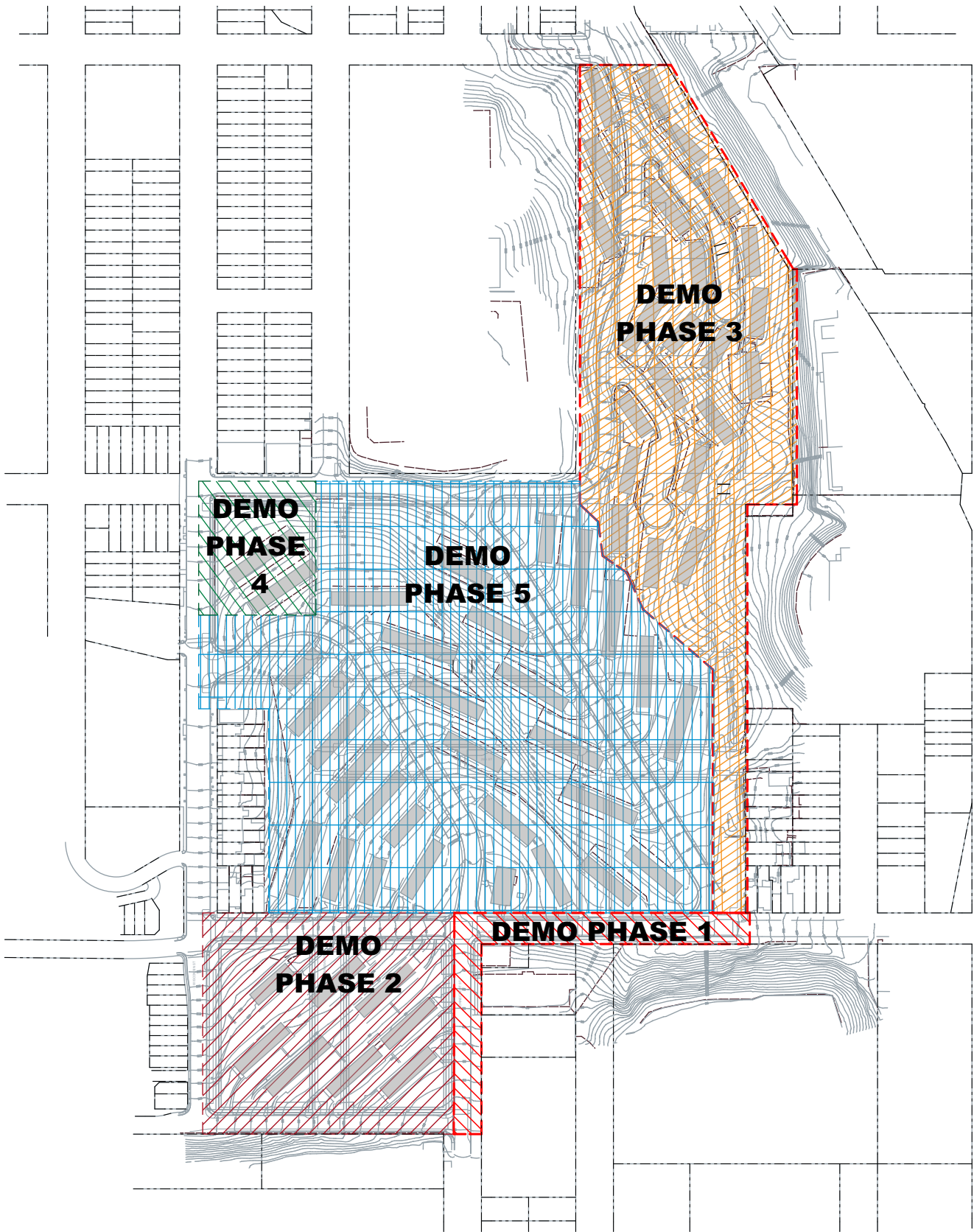


Figure 1.4a Demolition Phasing Diagram

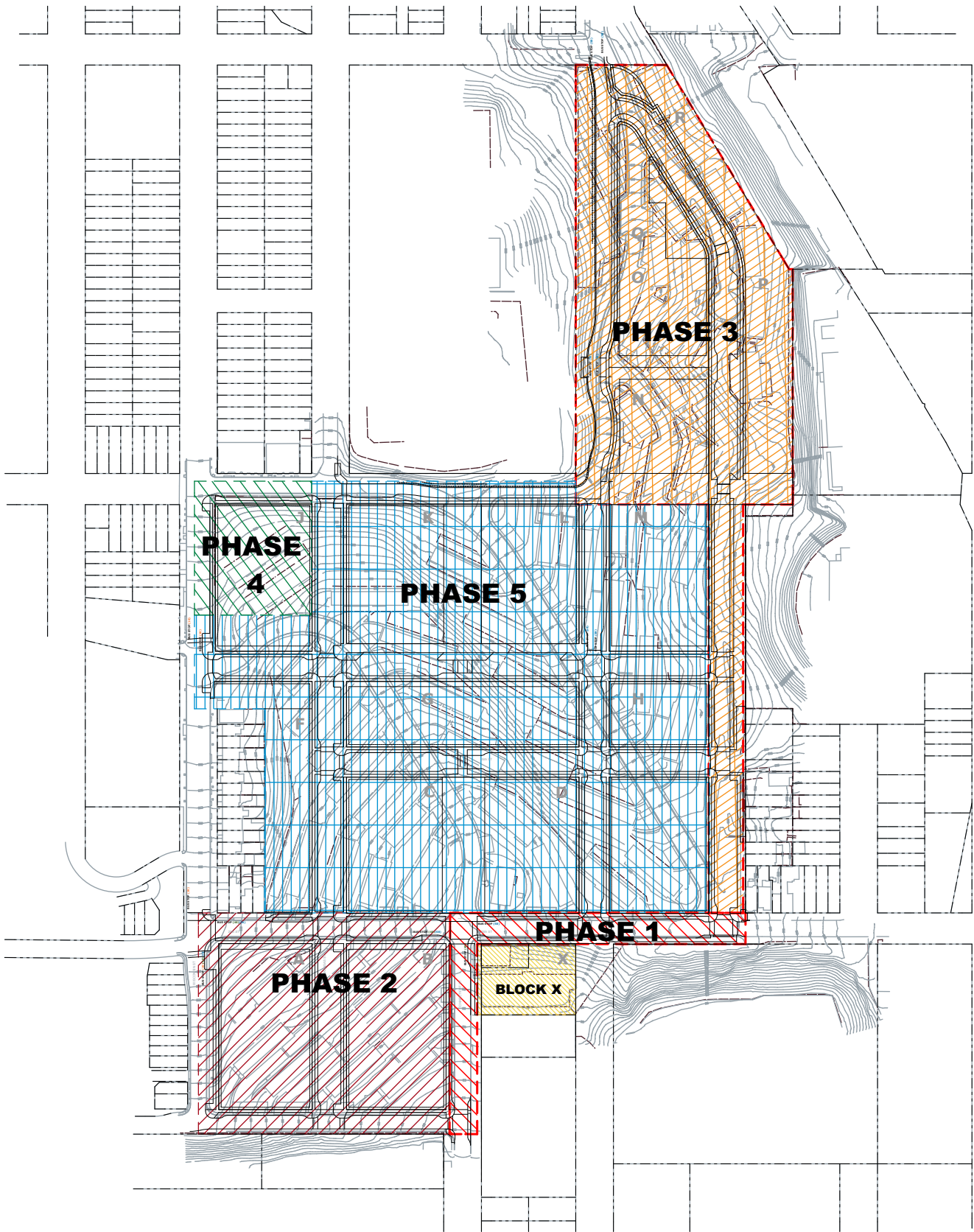


Figure 1.4b Development Phasing Diagram

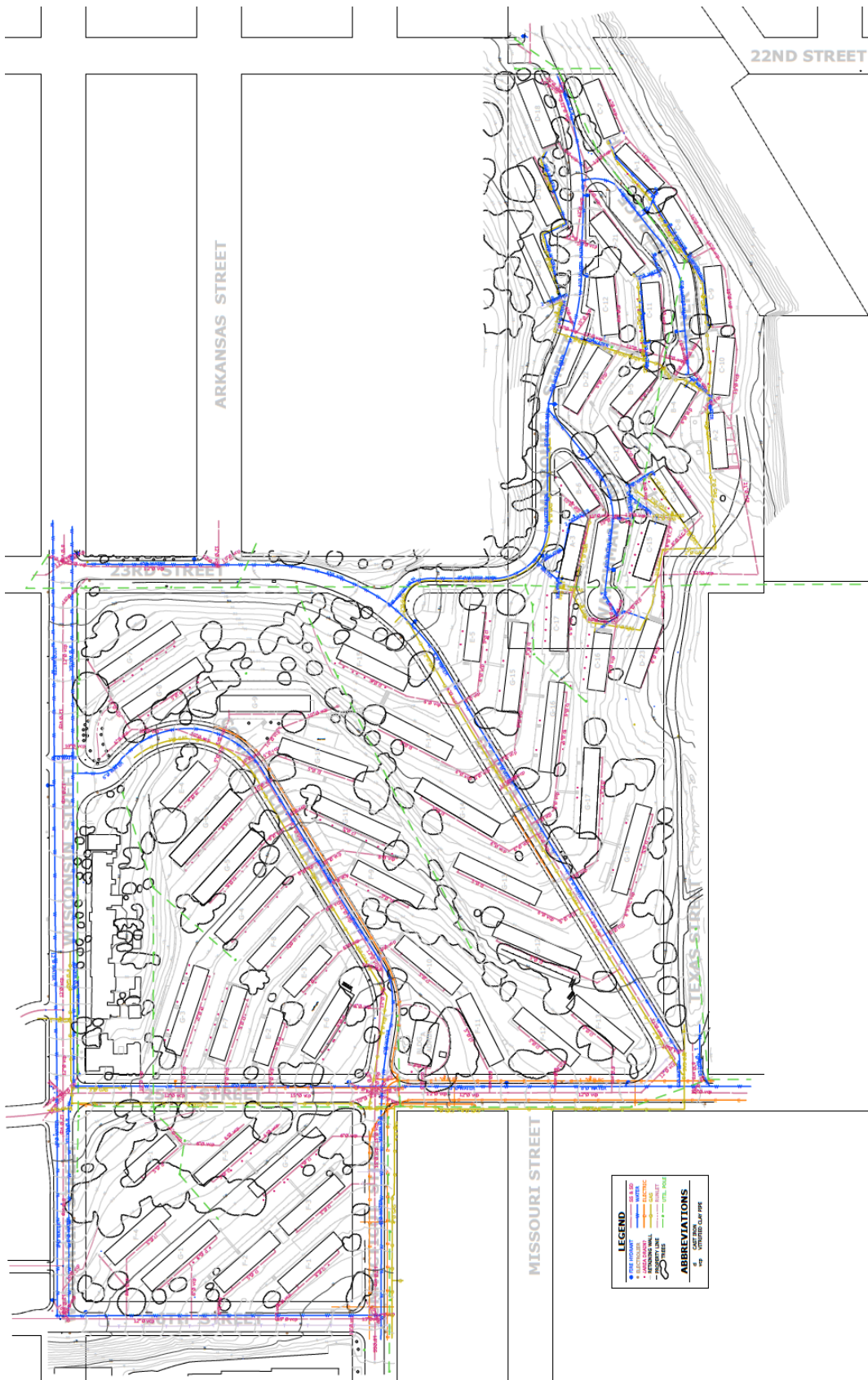


Figure 1.5 Existing Utilities (full size drawing available)

2. SUSTAINABILITY

Infrastructure is designed to facilitate the use of alternative forms of transportation, while reducing the use of resources such as water and energy. Key benefits of sustainable site design and infrastructure elements include improved health and cleaner environment. Sustainable infrastructure includes stormwater management facilities (i.e. landscaped park areas, landscape strips, flow-thru planters, bio-retention areas), transit facilities and traffic calming, and energy-efficient outdoor lighting. Each of these elements is addressed in other chapters of this Master Infrastructure Plan. Sustainable building designs will be addressed in the individual Phase and building permit application documents. Final designs of sustainable project elements within the public rights-of-way will be reviewed as part of the improvement plans, construction document, and Stormwater Control Plan approval process.

3. GEOTECHNICAL CONDITIONS

Site geotechnical investigations have been completed and potential site wide geotechnical improvements have been identified by ENGEO, culminating in the development of the "Geotechnical Investigation, Potrero Terrace and Annex Redevelopment" (Geotechnical Report) by ENGEO, dated July 10, 2009.

3.1 Existing Site Geotechnical Conditions

3.1.1 Existing Site Soils

As described in the Geotechnical Report, the Potrero Hope SF Master Plan Site is underlain by serpentinite bedrock. The bedrock is generally fairly shallow, at or within 2.5' of the surface. Portions of the site contain areas that were artificially filled in a manner that will require removal and recompaction. There is also an area of highly expansive colluvium near the center of the project along Connecticut Street that will also require removal and recompaction.

3.1.2 Site Geotechnical Constraints

From a geotechnical perspective, the following are the primary issues for new development at the Potrero Site:

3.1.2.1 Differential Settlement

Due to the large depths of cut and fill on the project, the possibility of differential settlement across building footprints exists. This issue will be addressed by following the recommendations of the geotechnical report, including placing and compacting the fill in small lifts or possibly overexcavation of parts of the pad to create a more homogenous subbase below the building.

3.2 Site Geotechnical Approaches

Successful site development will require engineering design and project construction methods that account for the existing soil conditions. These improvements will help ensure that site accessibility and building access is maintained both during seismic events and as minor long-term consolidation settlement occurs.

3.2.1 Geotechnical Soil Improvements

To reduce minor consolidation settlement at the site, existing weak and undocumented fill discovered beneath buildings may be over excavated and replaced with engineered fill or be remediated with soil improvements per the recommendations of the Geotechnical Engineer. Geotechnical remediation will be completed in conjunction with vertical building and infrastructure construction on individual Blocks by the Developer. Based on the results of, and if required by, final site geotechnical investigations, soil improvements required within the public right-of-way will be constructed by the Developer.

3.2.2 Building Foundations

Building foundation designs will be based on final geotechnical reports, site investigations and structural designs developed as part of the permitting process for vertical construction on the development

parcels. The Developer or subsequent owner of a development parcel will be responsible for the design and construction of building foundations.

3.2.5 Retaining Walls

It is anticipated that some of the existing retaining walls within the proposed development footprint will be modified or rebuilt due to grade changes and road realignment. The condition of retaining walls proposed to remain in place will be evaluated on a case-by-case basis during detailed design process. These walls may be seismically retrofitted or replaced to comply with City codes, the California Building Code (CBC), and the design-level geotechnical report. Where retaining walls are to be removed, proper shoring techniques, such as soldier pile and lagging systems or underpinning systems will be implemented to ensure the stability of existing site and adjacent facilities. Measures, such as the construction of new code-compliant retaining walls or retaining elements incorporated into the foundations of proposed buildings to address grade conflicts will be coordinated during the review and approval of construction documents and issuance of building permits. The retaining walls will be designed and constructed by the Developer and reviewed and approved by the DBI, the SFDRP, and the SFDPW. Where walls are located within the public rights-of-way and public parks, maintenance and ownership of the retaining wall will be the responsibility of the SFDPW, SFDRP, or another City of San Francisco agency upon acceptance of the final construction. Maintenance and ownership responsibilities for retaining walls constructed on private development parcels will be assigned to the owners of the individual Blocks in which the retaining walls are located. Design and Installation of interim retaining walls required to support the development of proposed on-site streets will be the responsibility of the Developer. **TO BE UPDATED**

3.2.6 Flexible Utility Connections

Portions of the site may experience differential settlement at the interface of pile supported buildings and the utility connections. Differential settlement at these locations may cause the utility connections to shear and break along this plane. Where required, flexible utility connections incorporating such solutions as flexible pipe materials, ball joints or settlement vaults, will be installed at the face of the building to mitigate the displacement of the utility connections and ensure continuous utility service.

3.2.7 Building Access

Settlement of the ground plane is anticipated in certain areas of the site due to an increase in fill depths and existing compressible clay soils. Where a pile-supported building structure interfaces with the on-grade public streetscape, differential settlement may occur where the compressible material beneath the street begins to settle relative to pile supported buildings. To mitigate areas where differential settlement is anticipated, grading and building designs will incorporate measures to ensure that continuous accessible paths of travel are maintained where building access points and private passageways interface with the public right-of-way.

Measures, such as hinge slabs, gangways and other adjustable surfaces, will be designed to accommodate the maximum anticipated long-term consolidation differential settlement. Alternatively, the project may consider a surcharging program, which induces consolidation settlement prior to the

construction of new improvements to reduce, and possible eliminate, the need for project specific differential settlement design mitigations.

3.3 Phase of Geotechnical Stabilization

Geotechnical stabilization will occur in phases to match the development sequence of the Blocks. The amount of stabilization will be the minimum necessary for the Block. The stabilization of smaller areas will allow the existing utility services and vehicular access areas to remain in place as long as possible in order to reduce disruption of access to the Blocks.

3.4 Schedule for Additional Geotechnical Studies

Geotechnical Reports to support the development of private building parcels will be prepared and submitted to the City as part of the building permit process.

3.5 Environmental Remediation

Special measures as directed by the Geotechnical Engineer may be necessary due to the high concentration of serpentinite soil and bedrock on the site. Naturally occurring asbestos (NOA) derived from the weathering of serpentinite has been found at the site. According to the geotechnical investigation, existing site soil free of organic material is suitable for use as engineered fill. If there is excess soil that contains high concentrations of the naturally occurring asbestos, it will be hauled offsite to a facility approved for handling these materials. The project geotechnical engineer will establish the necessary protocols for controlling air borne dust generated by the project's earth moving operations.

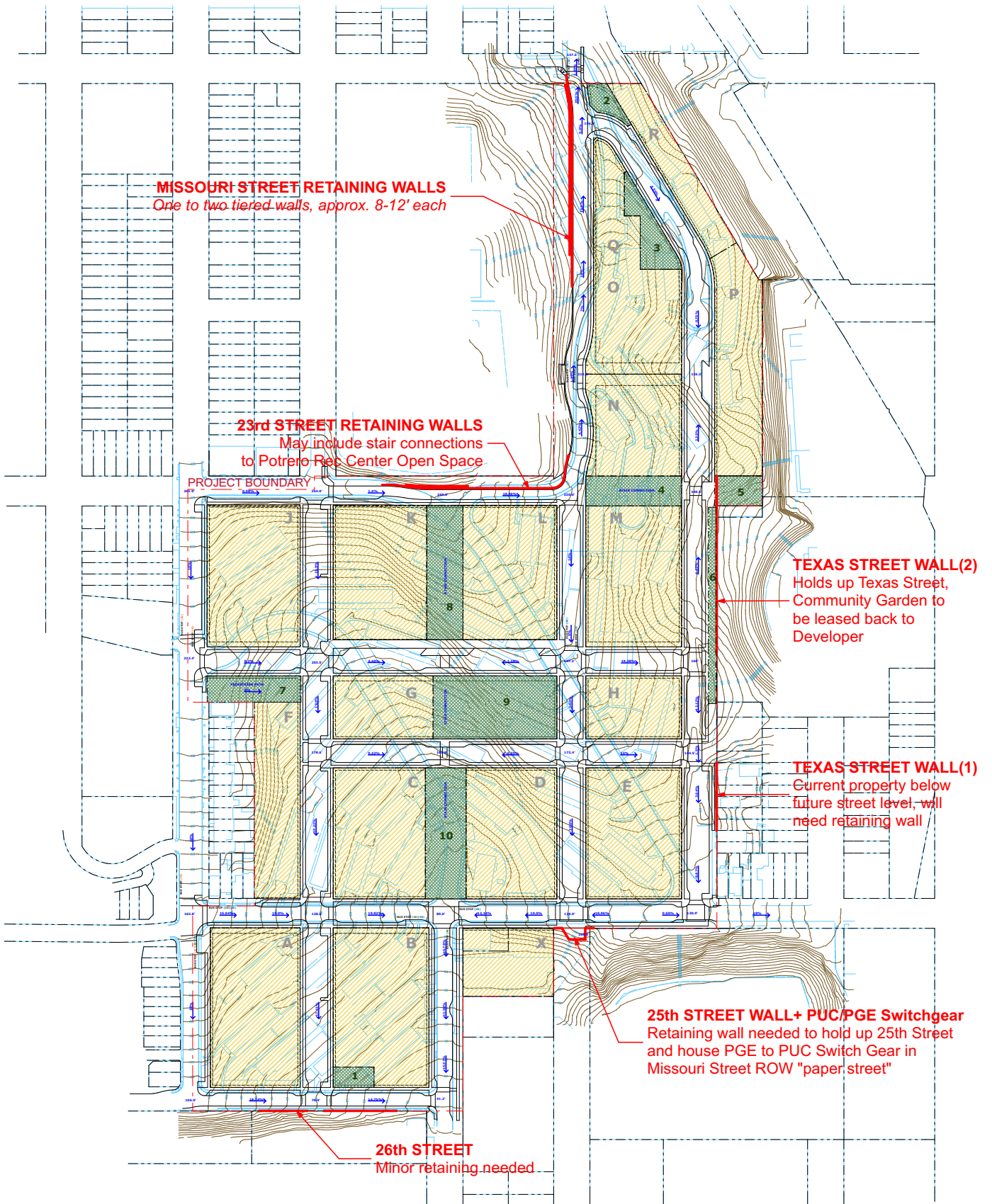


Figure 3.1 – Retaining Wall Map

4. PHASING AND DEMOLITION

4.1 Scope of Demolition

The Developer will be responsible for the demolition and deconstruction of all non-retained existing buildings and infrastructure features within the project boundaries. The design of permanent retaining walls to be integrated into buildings and streets will be reviewed and approved by the DBI and the SFDPW during the building design and permitting process and/or project construction documents. Remaining utility materials, primarily metals, will be recycled as feasible. Where transit pipe (asbestos-cement pipe) is encountered, appropriate abatement methods will be used to satisfy applicable regulatory agency requirements.

The Developer shall also be responsible for providing for the permanent improvements proposed to replace the existing improvements in accordance with the approved building and construction permits issued by the City. The extent of these improvements and associated demolition will be determined during the construction document approval process.

4.2 Demolition By Phase

The Developer will be responsible for demolition of existing buildings and infrastructure within the footprint of a phase prior to construction of the phase. Additional demolition for each phase may be required to allow construction of the improvements necessary to support a building or infrastructure phase. The conceptual limits of the existing infrastructure to be demolished as well as conceptual layouts of the permanent and/or temporary infrastructure systems for each Block will be provided as part of the construction document submittals for that Block or Phase. Repairs and/or replacement of the existing facilities necessary to serve the Block will be designed and constructed by the Developer.

4.3 Environmental Remediation

Any asbestos, lead, or similar materials encountered during building demolition will be handled and removed using appropriate abatement methods by trained personnel according to applicable regulatory agency requirements.

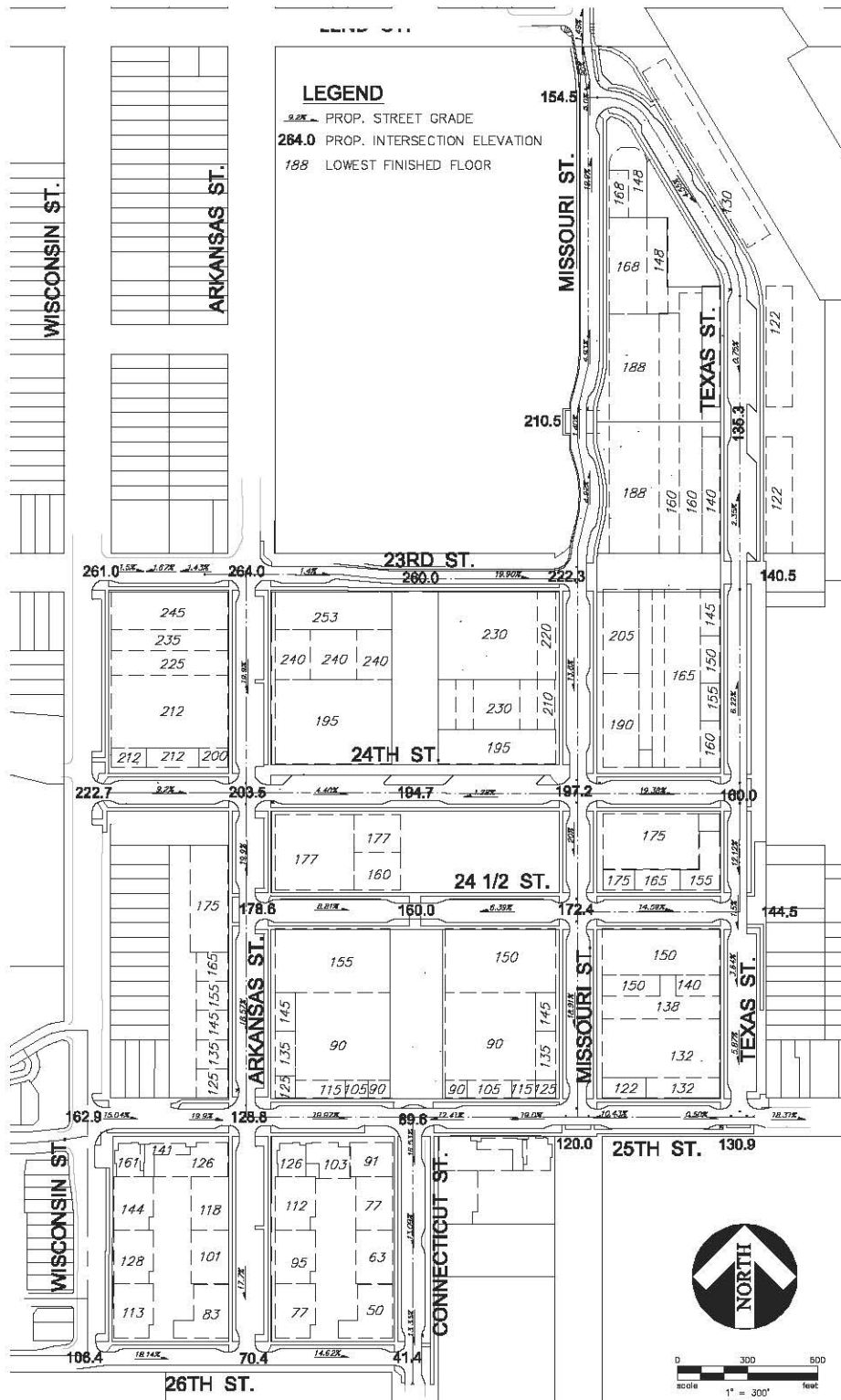


Figure 5.1 Conceptual Grading Plan

5. SITE GRADING

5.1 Existing Site Conditions

The existing grade within the Potrero Hope SF Master Plan Site slopes steeply downward from north to south. At the western edge, the site is bounded by and conforms to the existing grades along Wisconsin Street and some existing residences. To the east, the northern area is elevated above the existing Sherman Little property and the Food Bank while the southeastern edge is at grade along Texas Street. The ground elevations range from approximately 40 (SF Datum) in the southern portion of the site at the intersection of Connecticut and 26th Street to approximately 264 (SF Datum) near the intersection of 23rd and Arkansas.

5.2 Project Grading Requirements

5.2.2 Consolidation Settlement

Appropriate measures such as soil and foundation improvements will be constructed by the Developer to minimize differential settlement across the building parcels. To mitigate areas where differential settlement is anticipated, grading and building designs will incorporate measures to ensure that continuous accessible paths of travel are maintained where building access points and private passageways interface with the public right-of-way. Measures, such as hinge slabs, gangways and other adjustable surfaces, will be designed to accommodate the maximum anticipated long-term consolidation differential settlement.

5.3 Site Grading Designs

The Developer will be responsible for the design and construction of the proposed grading plan for the Potrero Hope SF Master Plan Site. Proposed grading designs for the development will match the existing north to south drainage pattern of the existing site. To ensure proper overland release and provide Americans with Disabilities Act (ADA) accessible sidewalks where feasible, a new street grid will be established on the site. Due to the steepness of the site, it is difficult to achieve the grades required to meet ADA requirements. The project will be designed such that the core of the project along 24th Street will have grades less than 5% and buildings that serve the entire community will be concentrated here. Throughout the site, grades less than 5 percent are provided as a first priority item, where feasible. As required due to site constraints, public access areas with slopes exceeding 5 percent but less than 8.33 percent will include handrails per Code requirements. The conceptual grading plan for the Potrero Hope SF Master Plan Site is included in Figure 6.1.

5.3.1 Proposed Site Grading at Conforms

Conceptual grading designs generally conform to the existing grades along the northern interface with the Potrero Hill Recreation center and the existing grades along Wisconsin Street at the western edge of the project. At the southern boundary of the project, 26th Street will be re-constructed to provide for the intersection with the extension of Arkansas Street. The eastern edge of the property will be graded to meet the grades near the existing top of slope. A retaining wall may be necessary to support community gardens along the central portion of the east side of Texas Street.

As more detailed designs are developed during the Grading and Overland Release Master Plan and construction document review processes of the project, the grading at conforms may require adjustment and refinement based on future coordination with the SFDPW.

5.3.2 Proposed Roadway and Building Areas

The proposed on-site street grid will be graded to provide overland release for the Project. As required by-the SFPUC, grading and hydrology designs will be developed such that the 100-year HGL is contained within the top of curb elevations on opposite sides of a street throughout each phase of the development.

Site development and grading designs will be developed to comply with the codified requirements for accessible paths of travel. Where feasible, proposed slopes along public street and private alleys will be set at a maximum of 5 percent to provide ADA accessible pathways of travel without requiring handrails. Outside of the street sidewalks, where accessible pathway slopes range between 5 percent and 8.33 percent, code-compliant ramps will be designed.

At street intersections, grades will be tabled at a maximum slope of 2% to provide an accessible path of travel in crosswalks. In addition, vertical curves within the streets will be designed to both begin and end outside the limits of the crosswalk areas. Review and approval of the overland release solution will occur during the master plan approval process described in Section 13. Construction of the overland release solution at this location will be the Developer's responsibility with ownership and maintenance responsibilities borne by the SFPUC or another City agency, unless negotiated otherwise as part of the master plan approval process.

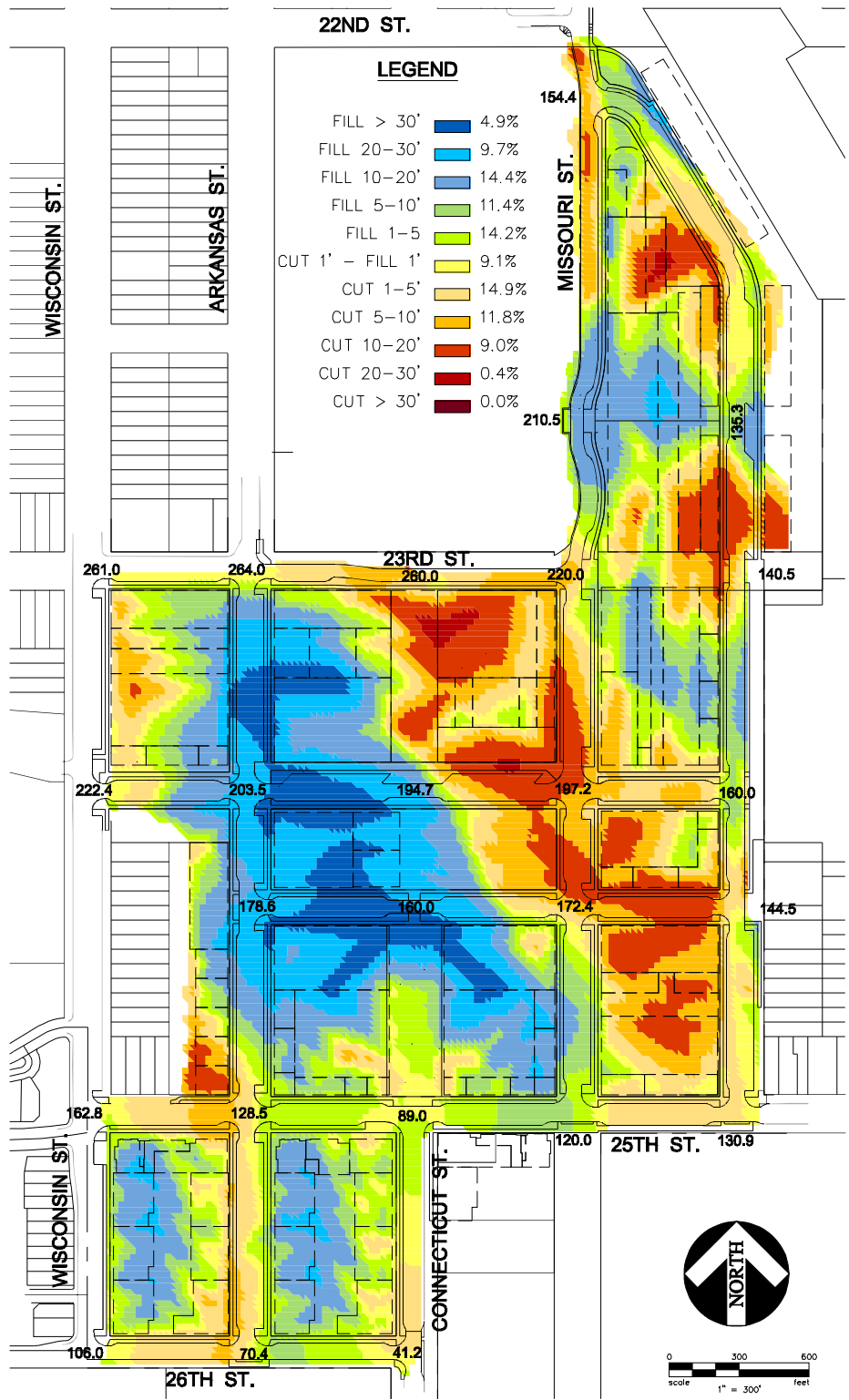


Figure 5.2 Site Earthwork Cut Fill Analysis

5.4 Proposed Site Earthwork

It is anticipated that the site earthwork will result in a net import of soil. Since preliminary design activities are still on-going, the earthwork quantities will be determined at later stages of the design. Earthwork activities for the project will comply with the state construction General Permit. To support future grading activities, a Storm Water Pollution Prevention Plan/Erosion and Sediment Control Plan will be submitted in parallel with future grading permits. The Developer will perform grading in conjunction with site remediation efforts.

5.5 Phases of Grading Activities and Approvals

The proposed rough grading will be completed in phases larger than the Blocks of the project, due to the large volumes of cut and fill necessary to achieve the street grid. The three primary phases of rough grading will be the southern (south of 25th Street), the northern (north of 23rd Street) and the central (the project area between 23rd and 25th Streets). Additionally, there may be smaller fine grading phases that would include the amount of grading that will be the minimum necessary for an individual Block. The phasing of grading will allow the Project to minimize the disruption to the adjacent and future built uses at the site, and to limit the amount of export required for any given rough grading phase. Impacts to improvements installed with previous phases of development due to the designs of the new Block will be the responsibility of the Developer and addressed prior to approval of the construction drawings for the new Block.

A Grading and Overland Release Master Plan and a Combined Sewer Master Plan will be submitted to the SFPUC and SFPDW for review and approval as outlined in Section 13. Comments provided by City and its agencies on the Master Plans will be incorporated into the construction document submittals for review and approval by the City and its agencies.

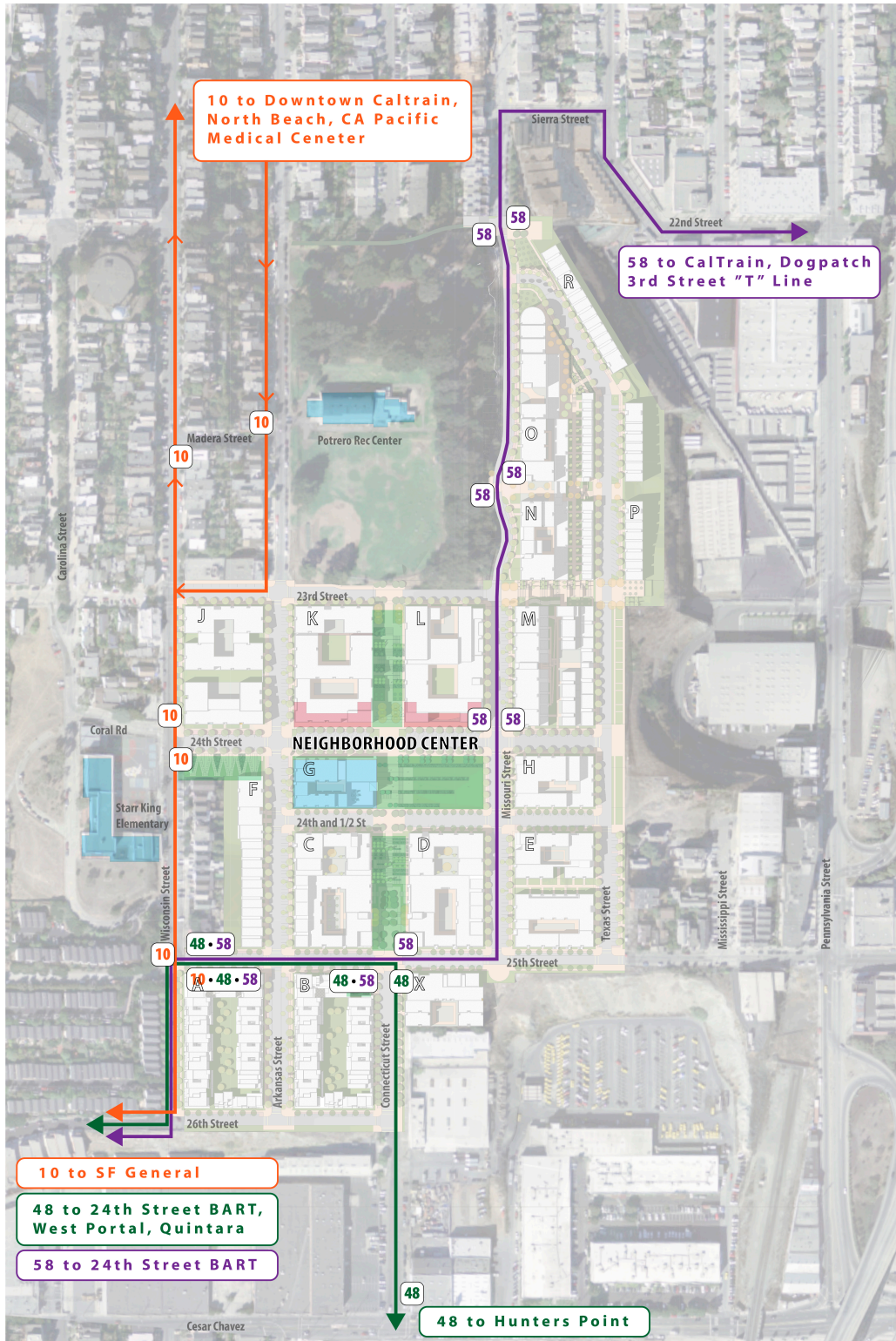


Figure 6.1 Public Transportation System Diagram

6. STREET AND TRANSPORTATION DESIGNS

The development of the Potrero Hope SF Master Plan is designed to connect and integrate the site with the rest of Potrero Hill. The alignments of existing streets adjacent to the site will be extended into and through the project area. The existing street network with Connecticut and Dakota Streets running up valley and ridge will be reconfigured to allow for through streets and create a relatively flat area along 24th Street between Arkansas and Missouri Streets. The new 24th Street will become the neighborhood center for the new development with small-scale neighborhood retail, community facilities and services, senior housing, and new gathering spaces including the Connecticut Stair, a retail plaza, and a central park. Additional descriptions of the streetscape are in the *Potrero Hope SF Design Standards and Guidelines*.

6.1 Public Transportation System

The Potrero Hope SF site currently has three MUNI bus lines running through it, the 10, 19 and 48. The 22nd Street Cal Train station is approximately ½ mile from the center of the site. The SFMTA's Transit Effectiveness Project (TEP) will be implemented during the design/construction phase of this project. After the TEP, the 10, 48, and 58 bus lines will run through the site. The design team has worked with the SFMTA to locate the bus routes and stop locations.

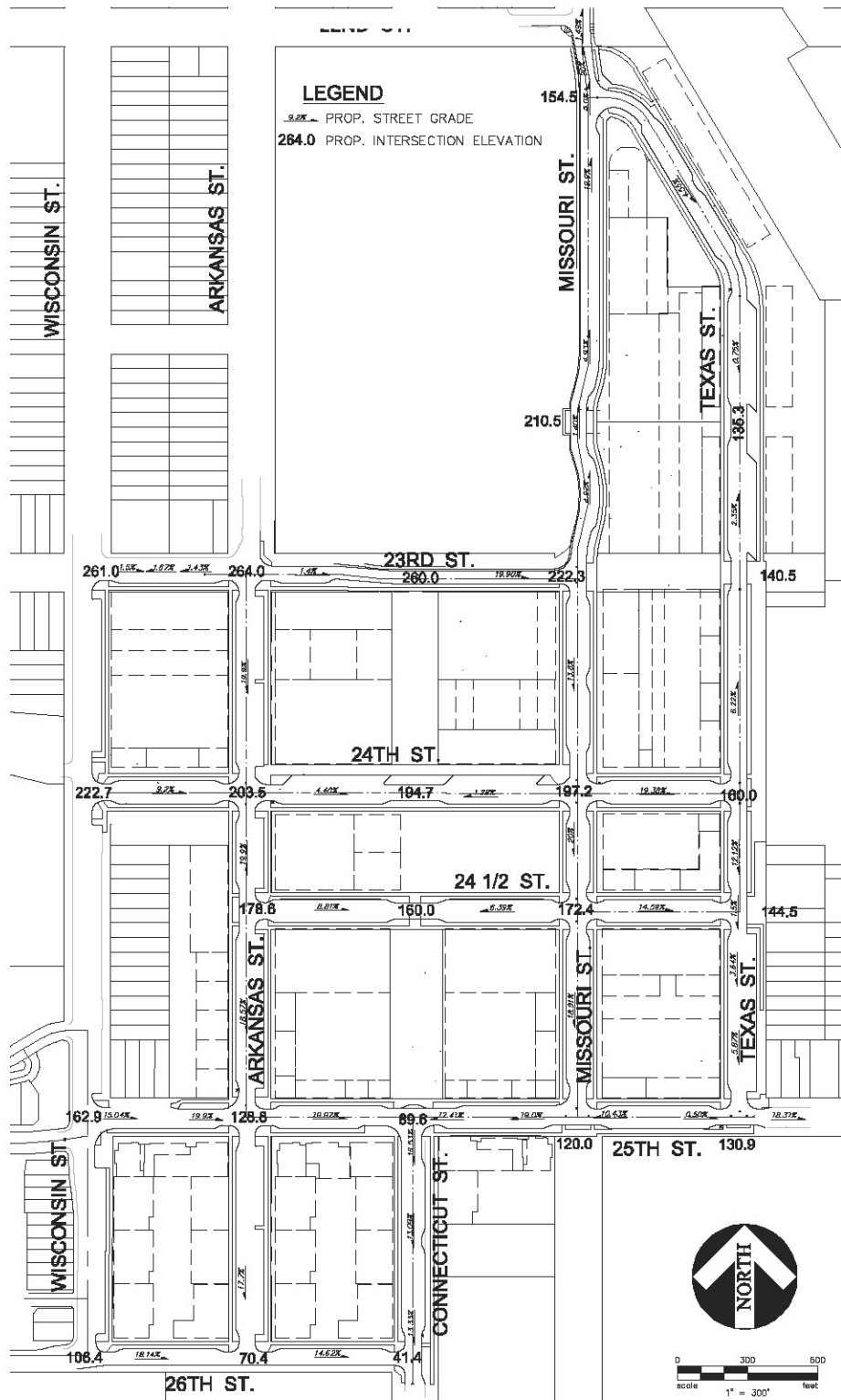


Figure 6.2 Conceptual Site Plan and Street Layout

6.2 Public Street System

The Developer will be responsible for the design and construction of the public streets.

Improvements will generally include the following:

- Pavement section
- Concrete curbs and gutters
- Concrete sidewalk and curb ramps
- Traffic control signs and striping
- Traffic signals
- Street lighting
- Street landscaping and trees
- Stormwater management facilities (may include such methods as landscape strips, permeable pavements, and small bio-retention planters or swales)
- Street furnishings (includes, but are not limited to, benches, trash cans, bike support facilities and pedestrian scale lighting)
- Accessible on-street passenger loading zones with adjacent street level passenger loading aisles and curb ramps.
- Accessible on-street parking spaces with adjacent curb ramps.

6.2.1 Public Street Layout and Parcelization

A grid system of streets has been established in the project site that connects with the existing grid in the surrounding neighborhood. Within the grid, individual blocks have been given letter designations to facilitate planning and design coordination as shown on Figure 6.6. 24.5th Street is a temporary street name for planning use with a final street name to be selected in the future. The proposed public street network for the Potrero Hope SF Master Plan Site is shown on Figure 6.2. Typical cross sections for these streets are based on those shown in the Potrero Hope SF *Design Standards and Guidelines* and included on Figures 6.3 through 6.8.

6.2.2 Roadway Dimensions

The dimensions provided in the *Potrero Hope SF Design Standards and Guidelines* consistent with this Master Infrastructure Plan indicate the vehicular, curb-to-curb lane widths. Street dimensions and configurations vary throughout the site. All street sections are located in Figures 6.3-6.10. Operational road widths outlined in this document and the DSG document are maximums and may be reduced during Phase Application pending the approval of all necessary City Agencies including Planning, DPW, SFMTA and SFFD.

Due to the steep topography of the site, there are no proposed official bicycle facilities on the site.

6.2.3 Landscape, Sidewalk and Setback Zone Dimensions

The dimensions provided in the *Potrero Hope SF Design Standards and Guidelines* illustrate the sidewalk designs and required setbacks. The typical sidewalk design includes a 6 ft landscape/furnishing zone with a 6 ft sidewalk throughway. Except where noted in the *DSG Document*, the minimum front setback for buildings is 5 feet. The sidewalk is to be designed with a continuous slope that follows the street grade.

Code-compliant accessible curb ramps, including, a 2-foot wide gutter pan for the full width of a crosswalk, will be provided at street corners to provide for pedestrian access across public streets.

6.2.4 Retaining Walls Supporting the Street A Public Right-of-way

Portions of Texas Street and the community gardens between the 23rd Street right of way and 24th Street will be supported by a retaining wall. The existing terrain drops away in this area and the roadway will need to be higher than existing ground in order for the street to be navigable. The wall will be designed and constructed to comply with City and County of San Francisco codes, the CBC, and the design-level geotechnical report. The design will account for vehicular live loads as necessary. **Ownership and maintenance of the wall will be controlled by the City in a right of way that extends to the eastern property line. BRIDGE, the maintenance association or a related entity will lease the portion of the right of way behind the curb in order to install and manage community gardens and BBQ/Picnic facilities in this area.**

Additionally the northern portion of Missouri Street and 23rd Street may require retaining walls to bridge the grade difference between the proposed development and the existing Potrero Hill Recreation Center. These walls will be designed and constructed to comply with City and County of San Francisco codes, the CBC, and the design-level geotechnical report. Ownership and maintenance of the walls will be controlled by the City in a right of way that extends to the existing property line to the west and north.

Retaining walls may be needed on 26th and 25th Streets to support the Right-of-way associated with tabling the intersections at Arkansas and Missouri Streets. Ownership and maintenance of the walls will be controlled by the City in a right of way that extends to the existing property line to the south.

6.3 Streetscape Design Considerations and Elements

6.3.1 Traffic Calming

As outlined in the *Potrero Hope SF Design Standards and Guidelines*, the site is designed with a variety of traffic calming measures to improve non-vehicular traffic and safety access. The traffic calming measures included include raised intersections, raised crosswalks, bulb-outs at intersections, back-in and head-in parking stalls with planted islands to reduce the visual width of the streets.

6.3.1.1 Raised Intersections and Raised Crosswalks

To accent the pedestrian stairs and passageways along the Connecticut Street Stair and the 23rd Street Stairs raised intersections/crosswalks are proposed on 24th Street, 24.5 Street and where 23rd Street Stair meets Texas Street. At these locations the street pavement areas will be raised approximately 6

inches to be at or near to the curb heights adjacent to the intersection and crosswalks. If accessibility guidelines and overland release requirements cannot be met at the raised intersection, the project will review options for incorporating an at-grade crossing with accessible curb ramps at these locations.

The intersection of Connecticut and 25th Streets is seen as an important gateway to the project and a special condition to slow traffic and provide for enhanced pedestrian facilities. Due to the bus stops and street geometries at this location, the intersection is proposed to be decorated with special paving or stamped concrete to signify the importance of the intersection. 6-inch curbs will be maintained.

The design for these intersections and crosswalks will be coordinated with and are subject to the approval of the SFPUC, SFPDW, the SFMTA, and the San Francisco Fire Department (SFFD). All paving will conform to DPW standards and be maintained by DPW as part of the public ROW.

6.3.1.2 Bulb-outs and Curb Extensions

The majority of all intersections are designed with bulb-outs with the exception of streets that require MUNI buses to make right-hand turns. The bulb-outs at intersections are designed with a 24 ft minimum curb-to-curb dimension and curb radii to meet SFFD and SFMTA turning radius requirements. Midblock bulbouts are designed with a 22 ft minimum curb-to-curb dimension. Bulb-outs will be designed in accordance with the horizontal separation distance requirements for subsurface utilities such as pipes, sewers, etc. as identified in the CCSF Subdivision Regulations.

The final design for the bulb-outs will be coordinated with the SF Planning, SFMTA, SFPDW, SFMTA, and the SFFD. Bulb-out improvements will be constructed if the designs can meet the SFPDW and SFPUC requirements for overland drainage release, utility clearances and accessibility for persons with disabilities.

6.3.1.3 Head-in Parking Stalls

Head-in parking stalls are proposed on the east side of Wisconsin, Arkansas, and Texas Streets. Head-in parking is typical along the north/south streets on Potrero Hill due to the steep streets and wide public ROW's. The proposed design uses this street typology throughout the project. The typical head-in space is designed with a 16 ft deep parking space with a planned 2 ft overhang into the landscape/furnishing zone. At regular intervals, planting islands will be located between parking stalls to provide for additional street trees that will visually reduce the width of the street. Gutters will be located adjacent to the through lanes. To accommodate the head-in stalls, the through lanes are designed with a minimum width of 11 ft 6 inches. The final design of the head-in parking stalls will be coordinated with the SFMTA and SFPDW.

6.3.1.4 Back-in Parking Stalls

Back-in parking stalls are proposed along the mixed-use portion of 24th Street between Arkansas and Missouri streets and along the northern section Texas Street. The back-in parking along Texas Street is designed with a 16 ft deep parking stalls and 11 ft 6 in. through lanes. Along 24th Street the parking stalls are designed at 17 feet deep to provide easier access in an out of the spaces due to the higher turnover rate adjacent to the retail and community services.

6.3.2 Fire Department and MUNI Access

Based on meetings with the SFFD, intersection radii, street widths, building setbacks and right-of-way layouts have been designed to accommodate operational access and fire truck and engine turning movements as documented in Figures 6.13 and Appendix A. The WB-40 design vehicle was used for all intersections. Turning radii for MUNI routes were vetted and approved by SFMTA.

Approach and departure from intersections will be designed with a 30' vertical curve in accordance with vehicle clearance diagrams and drawings reviewed by SFFD and SFMTA. See vertical clearance diagrams in Appendix C. Adequacy of clearances will be verified following construction of PHASE 1 (Connecticut Street between 26th and 25th Streets and 25th Street between Connecticut and Texas Streets).

6.3.3 Street Pavement Sections

The structural pavements cross-section for the vehicular travel lanes on all new public roadways will comply with the requirements of the San Francisco Subdivision Code. Vehicular travel way structural cross sections will typically consist of 8-inches of Portland Cement Concrete and a 2-inch asphalt concrete wearing surface for proposed on-site streets and shall be designed to the AASHTO rigid pavements design method using a 40-year design life. Any surface traversed by fire department vehicles shall be designed to support a minimum vehicle weight of 70,000 lbs. and 50 p.s.i. point of pressure and shall be an all-weather driving surface. Streets steeper than 17% will not have an asphalt concrete wearing surface per the 2015 Subdivision Regulations.

Painted concrete, special striping or other special decorative treatment, meeting accessibility requirements as determined by the SFDPW, may be used at raised crosswalk and intersection locations in conformance with the *Design Standards and Guidelines*. Final special pavement designs are subject to the approval of the SFDPW during the construction document phase of the project and shall be designed to the AASHTO rigid pavements design method using a 40-year design life.

The use of alternative pavements in the public right-of-ways described above or other alternative pavement sections, such as asphalt concrete wearing surface over Class 2 aggregate base, porous paving, and decorative pavement (patterned concrete, patterned asphalt, paving stones, etc.) are subject to review and approval by the SFDPW and SFPUC. The project maintenance association will be responsible for maintenance and restoration of the pavement markings within areas with special striping or decorative treatments.

6.3.4 Proposed Street Lights

The Developer will design, layout and install the proposed project street lights. Street lighting shall comply with City of San Francisco standards for photometrics and acceptable fixtures. City standard street lights will be used. A park Pole Light will be used throughout the proposed public parks. Building mounted lights are recommended where buildings flank the pedestrian alleys or paths. The street and pedestrian light poles and fixtures shall comply with the SFPUC's "Guide to San Francisco, Street Lights," and the final pole and fixture selection shall be approved by the SFPUC. As necessary, temporary park pole light standards will illuminate any sidewalks or temporary pathways that are constructed to provide pedestrian access before the adjacent buildings are complete and building mounted lights are

operational. The electrical service for the street lights will be located within the joint trench (refer to Section 14).

The 60% and 95% street light construction documents and specifications will be submitted to the SFPUC for review, comment and approval prior to construction. Streetlights located on privately-owned (but publicly accessible) pedestrian streets will be maintained by the private property owners.

6.4 Off-site Traffic Signalization

Off-site traffic signalization shall be provided as described in the Mitigation and Monitoring and Reporting Program approved as part of the Project's Environmental Impact Report.

6.5 On-site Traffic Control

Traffic calming and stop-controlled intersections, rather than signalization, are the primary strategy for on-site traffic control. Stop signs will be added at most of the intersections, with final locations to be coordinated with the City and based on a traffic sight distance requirements and project phasing. Additional descriptions of the streetscape traffic control elements are included in the Open Space and Streetscape Master Plan. If implemented, stop signs on city streets will require legislation from SFMTA Board and traffic calming may also require SFMTA Board and/or public hearing.

6.6 Acceptance and Maintenance of Street Improvements

Upon acceptance of the new and/or improved public streets by the SFPUC, responsibility for the operation and maintenance of the roadway, streetscape elements, and retaining walls will be designated as defined in the various City of San Francisco Municipal Codes. Acceptance of water, power, and wastewater utility infrastructure within street improvements shall be subject to SFPUC approval. Proposed water, power, and combined sewer infrastructure shall be designed to facilitate future access for maintenance. Conflicts between proposed public water, power, and combined sewer infrastructure and the surface improvements proposed as part of the project, including but not limited to dedicated transportation routes, trees, bulb-outs, traffic circles and medians, shall be minimized in the design of the infrastructure and surface improvements. The SFPUC will review all proposals for surface improvements above proposed public water, power, and combined sewer infrastructure on a case-by-case basis to ensure that future access for maintenance is preserved. Street improvements installed to meet the SFPUC stormwater management requirements will be maintained by the private property owners or their Assignees.

6.8 Phasing of New Roadway Construction

The Developer shall indicate the phase limits upon submittal of each Phase Application, as further defined in the DA. Phase Applications will include a brief description of the infrastructure required including new roadway system and traffic control improvements to serve the proposed development phase. The amount of the existing roadway repaired and/or replaced will likely be the minimum necessary to serve the Block. Repairs and/or replacement of the existing facilities necessary to serve the Block will be designed and constructed by the Developer. Fire truck turnaround areas, if any, will be coordinated with the SFFD and constructed by the Developer consistent with the Fire Code. Phasing of off-site improvements will be based on cumulative development thresholds identified by the project

traffic consultant and/or the SFMTA coincident with the Phase applications, construction documents or as stated in the DA. Sidewalk and other accessible pedestrian paths of travel, either permanent or temporary, shall be provided to serve the pedestrian entrance and exit requirements of each block prior to being released for occupancy. Such paths of travel will connect to the existing neighborhood sidewalks and hence to the public transit stations and bus stops thereon.

Impacts to improvements installed with previous phases of development due to the designs of the new phase will be the responsibility of the Developer and addressed prior to approval of the construction drawings for the Block.

6.9 SFMTA Infrastructure

Where required, the following list of infrastructure items includes items to be owned, operated and maintained by the SFMTA within public rights-of-way:

- Security monitors and cameras
- Signals and Signal Interconnects, including Muni Bus Prioritization signals
- TPS signal preempt detectors
- Conduit containing TPS signal cables
- Shelters
- Paint - poles and asphalt delineating coach stops
- Asphalt painting for transit lanes
- Departure prediction ("NextBus") monitors and related communications equipment
- Bicycle racks
- Crosswalk striping, except for areas with a raised intersection/crosswalk or with painted concrete special striping or other special decorative treatment
- Bike lane and facility striping
- APS/Pedestrian crossing signals
- Street Signs

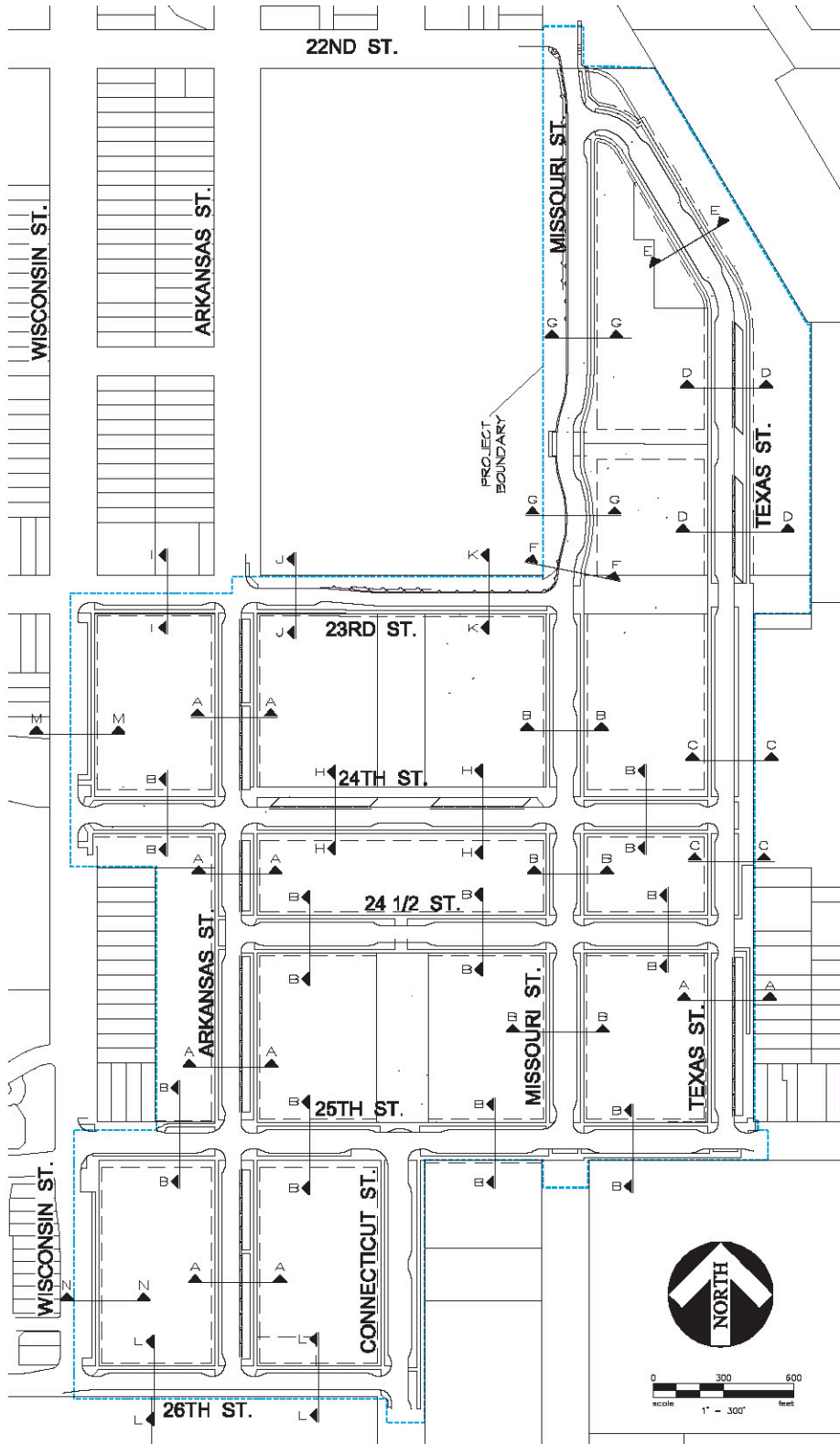


Figure 6.3 Plan View and Cross Section Locations

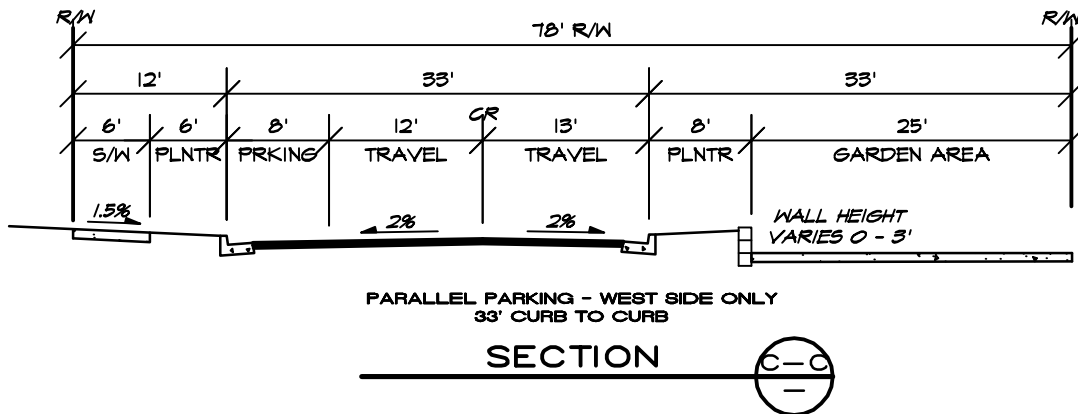
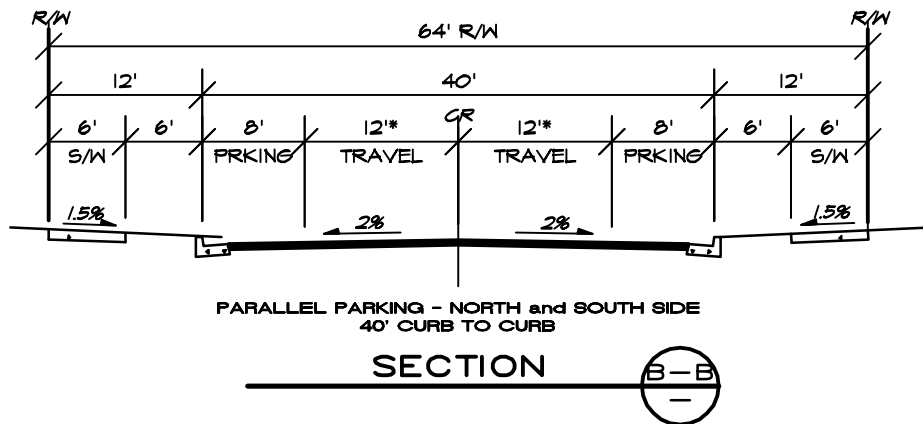
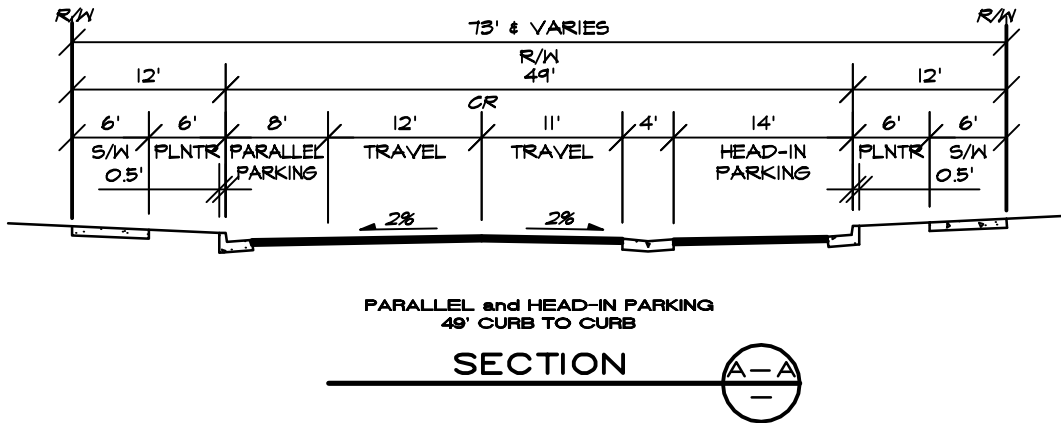


Figure 6.4 – Typical Street Cross Sections A-C

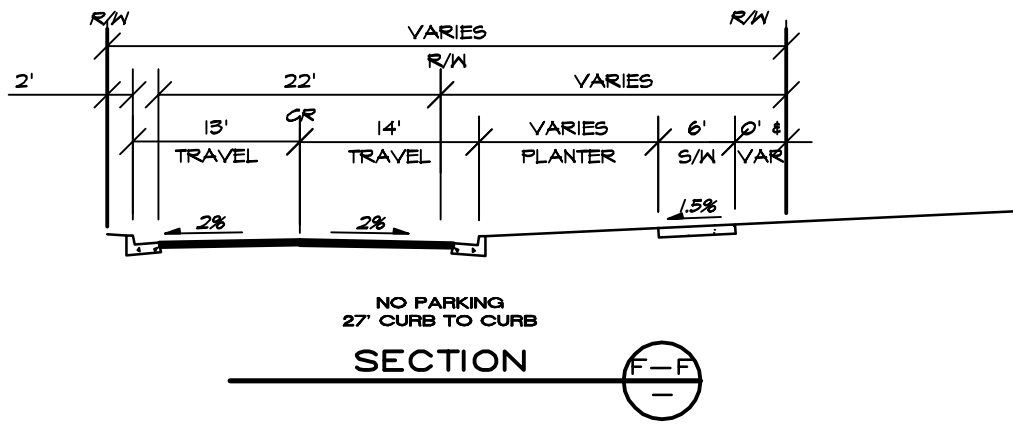
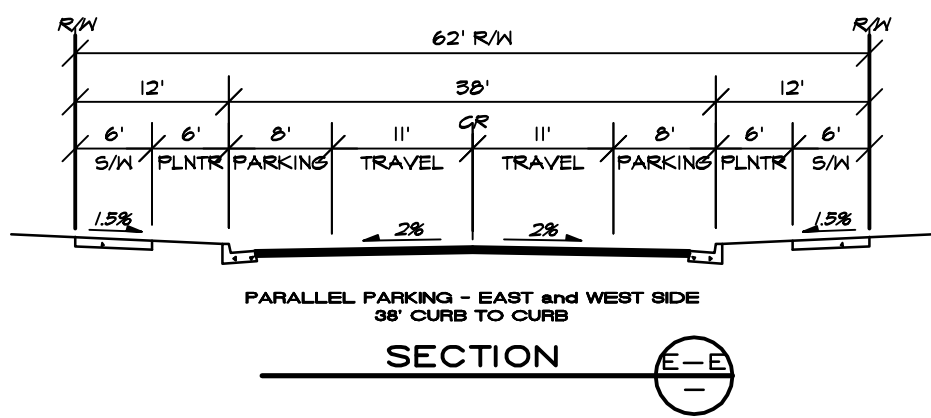
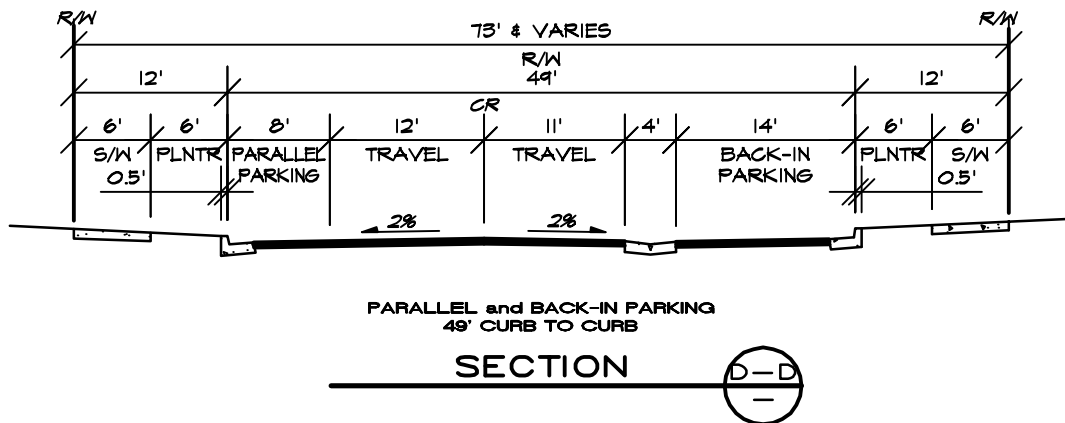
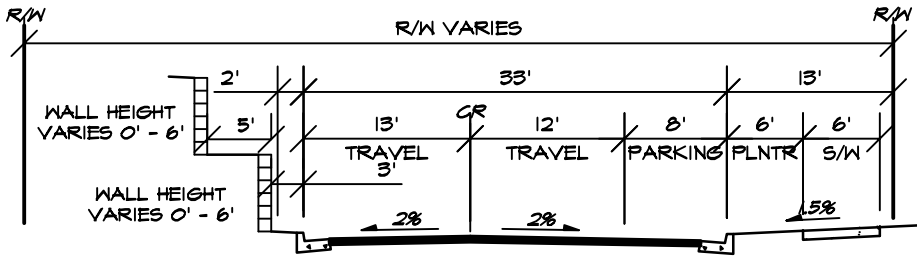
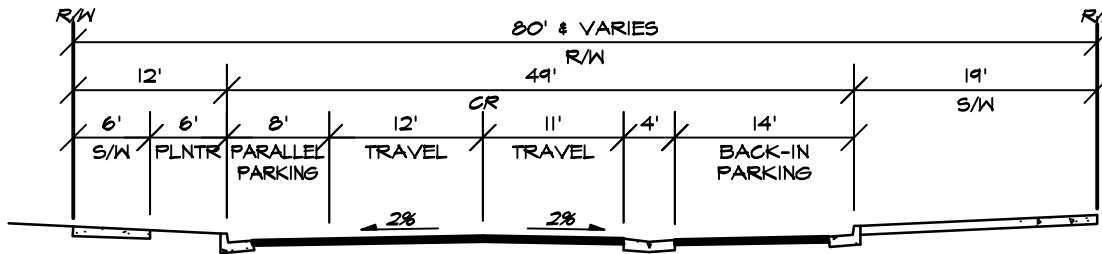


Figure 6.5 –Typical Street Cross Sections D-F



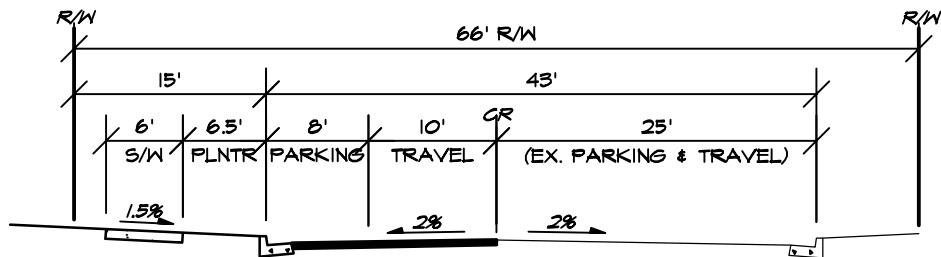
PARALLEL PARKING - EAST SIDE ONLY
33' CURB TO CURB

SECTION



PARALLEL and BACK-IN PARKING
48' CURB TO CURB

SECTION

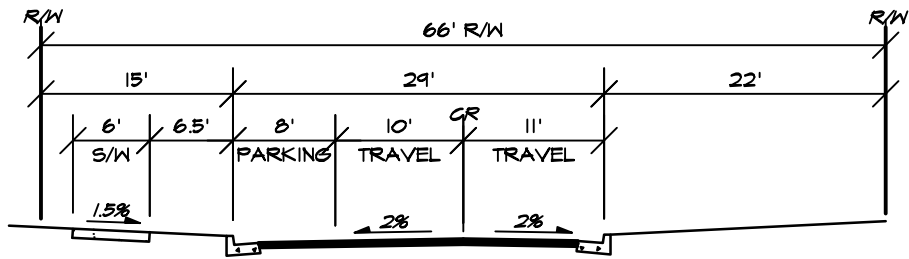


PARALLEL PARKING - SOUTH SIDE ONLY
43' CURB TO CURB

SECTION

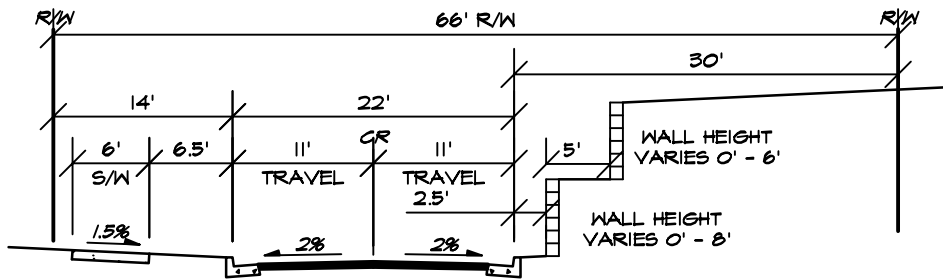


Figure 6.6 – Typical Street Cross Sections G-I



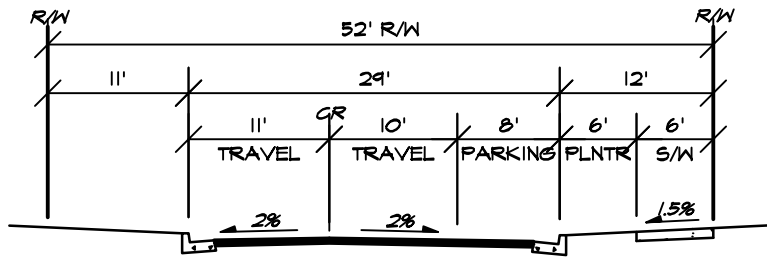
PARALLEL PARKING - SOUTH SIDE ONLY
29' CURB TO CURB

SECTION



NO PARKING
22' CURB TO CURB

SECTION

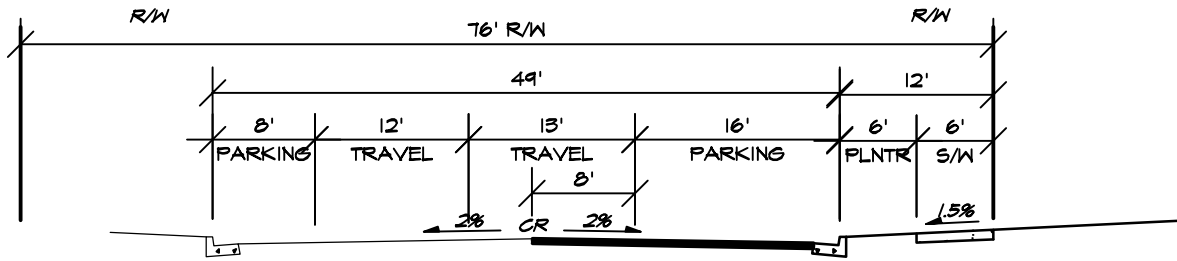


PARALLEL PARKING - NORTH SIDE ONLY
29' CURB TO CURB

SECTION

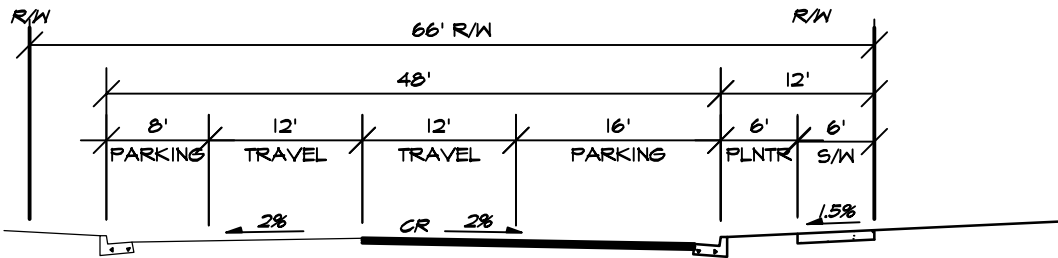


Figure 6.7 – Typical Street Cross Sections J-L



HEAD-IN PARKING - EAST SIDE ONLY
49' CURB TO CURB

SECTION

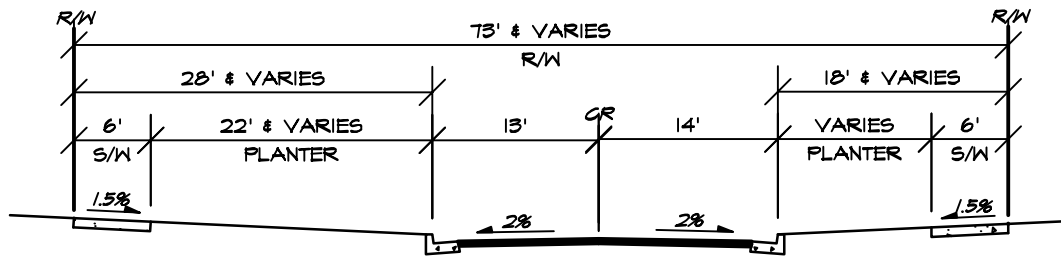


HEAD-IN PARKING - EAST SIDE ONLY
48' CURB TO CURB

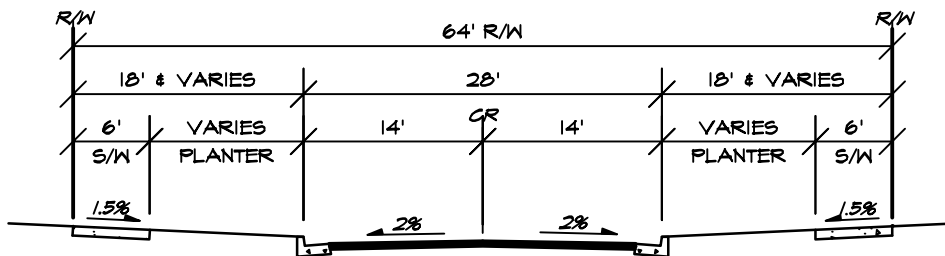
SECTION



Figure 6.8 – Typical Street Cross Sections M-Blub-outs

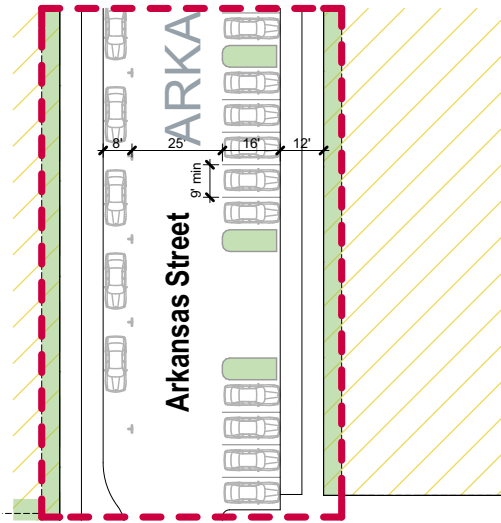


**26' WIDE NECK DOWN
27' WIDE NECK DOWN CONDITION #1 PER PLAN**

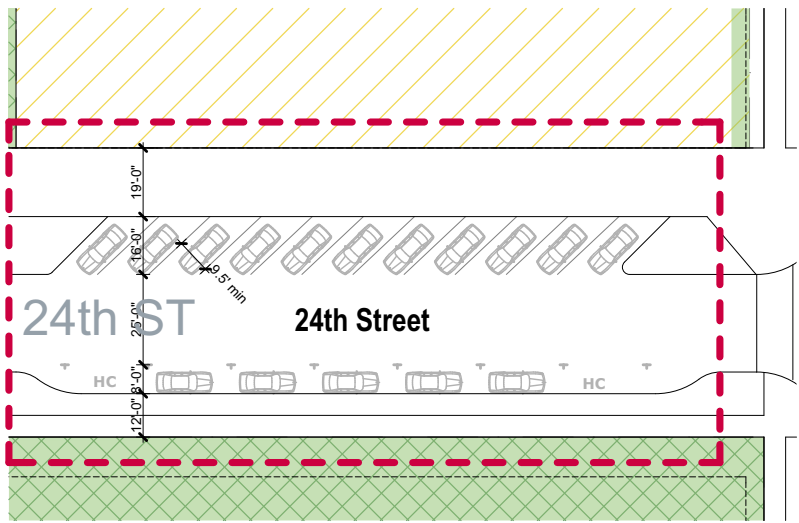


**28' WIDE NECK DOWN
28' WIDE NECK DOWN CONDITION #2 PER PLAN**

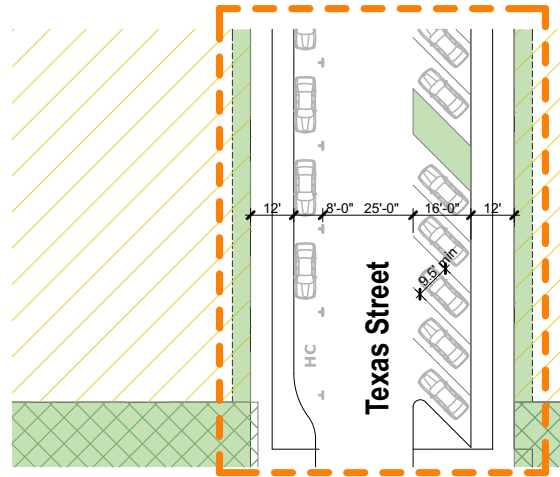
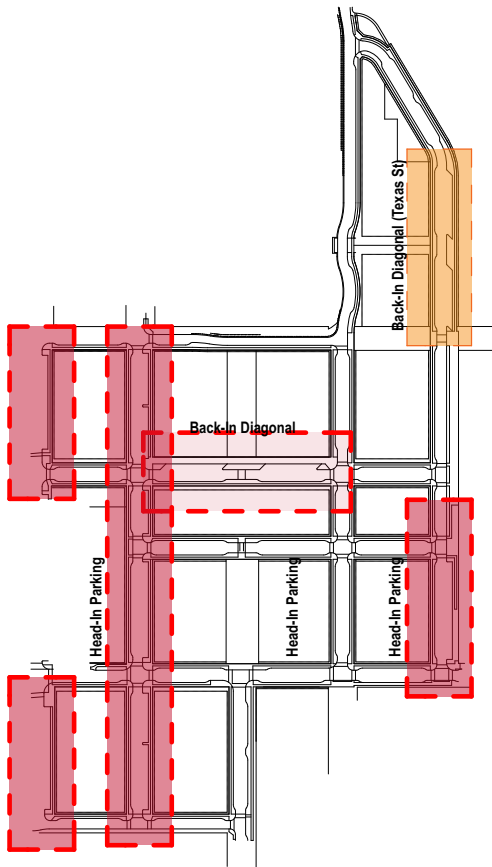
Figure 6.9 Typical Bulb-Out Neck Down Condition



Head-In Parking (typ)



Back-In Diagonal Parking (24th Street)



Back-In Diagonal Parking (Texas Street)

Figure 6.10 Typical Head-In and Back-in Parking Details and Location Map

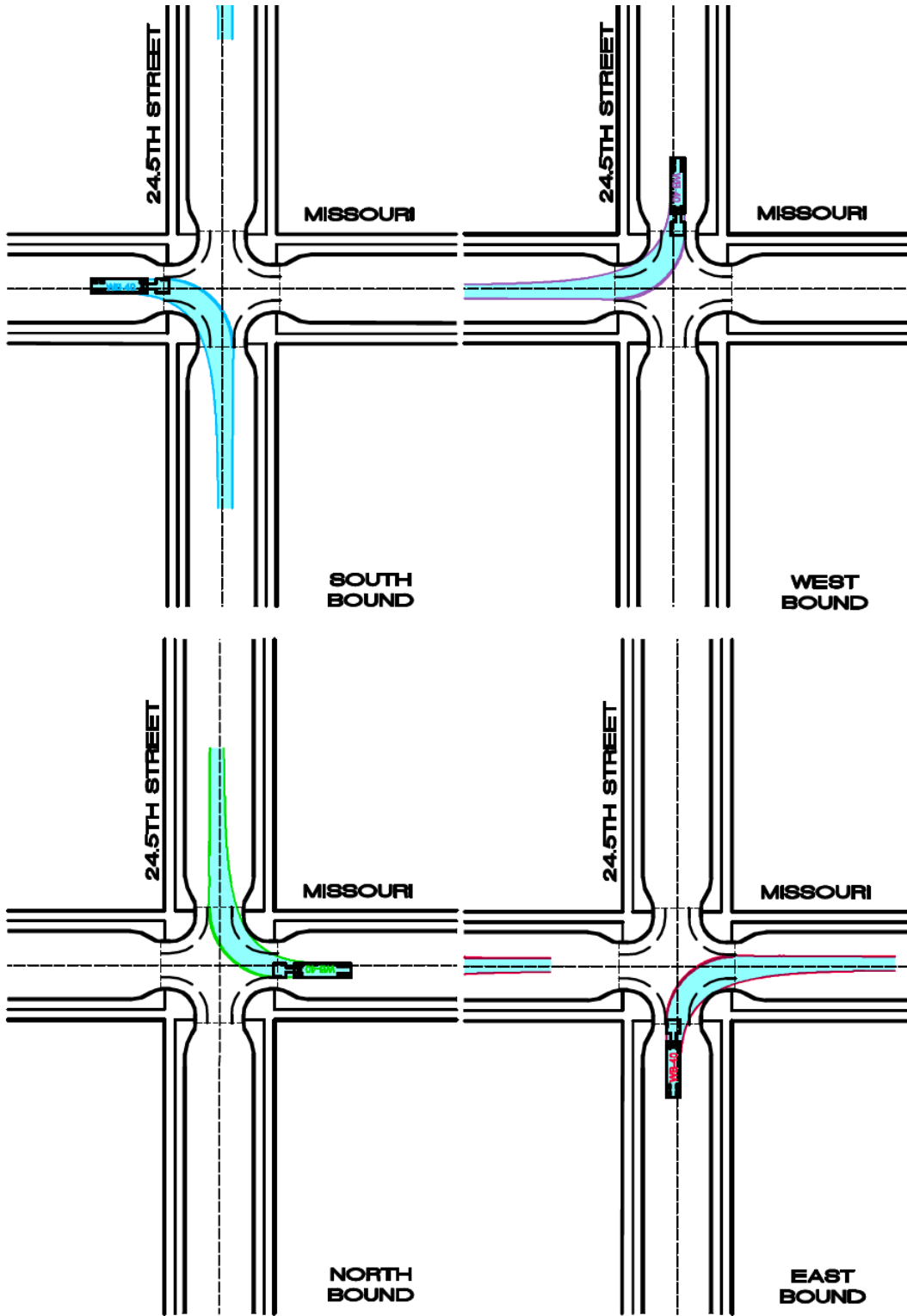


Figure 6.11 Typical Intersection Detail with Fire Truck Turning WB-40
 Turning templates for intersections provided in the Appendix A

7. OPEN SPACE AND PARKS

7.1 Proposed Parks and Open Spaces

The open space concept builds off of the street network, urban design and circulation concepts to locate a variety of open space types throughout the project site and create new connections to the existing open spaces in the neighborhood. The location of each park, conceptual design, and detailed descriptions are provided in the *Potrero Hope SF Design Standards and Guidelines*.

Safe, active and inviting public spaces are key to the success of a new neighborhood. The new parks are designed and developed as part of the existing open space network, including Starr King Open Space and Potrero Hill Recreation Center. These new and existing open spaces will be connected by tree lined streets and generous landscape stairs, which in turn link to private stoops, porches, entry courts and courtyards. Together these landscape and streetscape elements constitute a central cross of open spaces along 24th and Connecticut Street that connect the project area to the surrounding neighborhoods.

Smaller parks are located at the intersection of Arkansas and 26th Streets and at the confluence of Texas and Missouri Streets. Additional open spaces are created with generous pedestrian connections throughout the site. Stairs along Connecticut and 23rd Street provide unique open spaces with grand views to the south and east. The cliff edges along 25th and 26th street provide a green edge to the south with small gathering areas to rest and enjoy the view. Along Texas Street, a community garden will be located on the east side of the street that will include a bbq and picnic area across from the 23rd Street Stair.

These park and infrastructure improvements, including stormwater collection facilities, stormwater management facilities, irrigation systems, and fire hydrants, will be designed and installed per City standards by the Developer. Playground and park designs shall be reviewed and approved by SFDPW prior to permit issuance and shall be inspected for compliance with the approved plans prior to being sanctioned for use.

In addition to the above parks and open spaces, the BRIDGE team intends to work collaboratively with the SFDPW to coordinate improvement plans along the 22nd Street ROW between Missouri and Arkansas Street. This connection is a key connection that provides access to the Potrero Rec Center and connects residents to the west to the 22nd Street Caltrain stop, 3rd Street MUNI and the Dogpatch. The current ROW has an unsafe and degrading path that should be updated with a safer stair. It is anticipated that the cost of the design, installation, and maintenance of any improvements would be the responsibility of SFDPW.

7.2 Phasing, Operations and Maintenance for Open Space and Parks

The Developer will construct the new parks with the development phases. The following identifies construction triggers that will dictate the completion of the proposed public park improvements:

Block A/B Mini Park: Construction will be completed concurrent or prior to development of two of the adjacent Blocks Location of park may be located at 25th And Connecticut Street or at 26th And Arkansas Streets (Blocks A and B).

Gateway Open Space: Construction of the portion of the Gateway Open Space contiguous with Block O will be completed concurrent or prior to completion of the development of block O. Construction of that portion of the Gateway Open Space contiguous with Block R will be completed concurrent or prior to completion of the development of Block.

Texas Street Edible Garden: Construction will be completed concurrent with or prior to the completion of either the adjacent Block H or M, whichever is later.

23rd Street Stair: Construction will be completed concurrent with or prior to the completion of the two of the adjacent Blocks (Blocks N and M, whichever is later).

Connecticut Park Terrace (24.5 to 25th): Construction will be completed concurrent with or prior to completion of the adjacent Block C or D, whichever is later.

Connecticut Park Terrace (23rd to 24th): Construction will be completed concurrent with or prior to completion of the adjacent Block K or L, whichever is later.

24th Street Central Park: Construction will be completed concurrent with or prior to completion of the adjacent block G or H, whichever is later.

24th Street Squiggle Park: Construction will be completed concurrent with or prior to completion of the adjacent block G.

The maintenance of improvements within the parks, including stormwater management facilities within the park, will be funded wholly or in part through private sources, as described in the DA.



Figure 7.1 Open Space, Parks and Stairs Diagram
 (mini park may be located at illustrated location or 25th and Connecticut Street)

8. Water Systems

8.1 Existing Low Pressure Water System

Water service will be provided by a water supply, storage, and distribution system operated by the SFPUC. The system will be used for domestic water supply and low-pressure fire hydrants. The existing low-pressure water system surrounds and crosses the site in all of the existing streets, with major lines in 26th and Wisconsin Streets.

8.2 Proposed Low Pressure Water System

8.2.1 Project Water Demands

From the project EIR, the project water demands stated as total required flow rate are identified in the Table 8.1 below. Without knowing the size and construction type, the fire flow number assumes a worst case of 8000 gpm, but with 50% reduction for sprinklered buildings per the Fire Code. The irrigation demand assumes that the annual demand will occur in a 5 month period with all of the watering occurring in a 3 hour window. A Potable Water Master Plan that outlines the Project's methods used for calculating the flow demands will be submitted to the SFPUC for review and approval in accordance with Sec. 13 Utility Master Plans.

8.2.2 Project Water Supply

As included in the project EIR, the SFPUC has determined that there are adequate water supplies to meet the Project's water demands through 2035. The SFPUC passed Resolution 13-0110 approving the Water Supply Assessment for the Potrero HOPE SF Master Plan on July 9, 2013.

8.2.3 Project Water Distribution System

The low-pressure water system will be designed and constructed by the Developer, then owned and operated by the SFPUC upon construction completion and improvement acceptance by the SFPUC. The proposed low-pressure water system is identified schematically on Figure 8.1. This domestic water supply and fire protection system consists of ductile iron pipe mains, low-pressure fire hydrants, valves and fittings, and appurtenances. Final pipe sizes, locations, connections and interconnections, flows, pressures, and location and number of fire hydrants will be determined with an EPANET hydraulic model analysis using appropriate design criteria reasonably established by the City. The potable water infrastructure will be located within the public street pavement such that the outside wall of a water or combined sewer pipe is a minimum of 1-foot clear from the lip of gutter and a minimum of 5-feet clear from a proposed tree trunk. The project water system will be modeled by the SFPUC during the Potable Water Master Plan review process to determine on-site system infrastructure requirements. After the Potable Water Master Plan approval process is substantially complete, final water system infrastructure designs for improvements within the new project streets will be submitted to the SFPUC for approval as part of the construction document plan set.

Vertical and horizontal separation distances between adjacent combined sewer system, potable water, and dry utilities will conform to the requirements outlined in Title 22 of the California Code of Regulations and the State of California Department of Health Services Guidance Memorandum 2003-02.

See Typical Street Utility (Figure 8.2) for depth and relationship to other utilities. Required disinfection and connections to new mains will be performed by the SFPUC

8.2.4 Proposed Fire Hydrant Locations

As shown on Exhibit 8.3, proposed on-site and off-site fire hydrants have been located at a maximum radial separation of 300 feet between hydrants. In addition, building fire department connections will be located within 100-feet of a fire hydrant. Final hydrant locations are subject to the approval of the SFFD, SFPUC, and will be located outside of the curb returns per DPW Order 175,387, where feasible. If fire hydrants are required within the curb returns to meet SFFD requirements, the project will work with the SFPUC and SFPDW to request an exception per Sections VI and VII of DPW Order 175,387.

8.3 Off-site Mitigations

Given the increase in project density, the SFPUC will re-evaluate the project's impacts to its existing system surrounding the site as part of the Utility Master Plans approval process and confirm the required off-site mitigations to serve the redevelopment project. If off-site improvements are required, it is anticipated that the Developer will either design and construct the off-site improvements or pay a fee to the SFPUC to cover the design and construction costs in the future. The off-site improvements will be owned, operated and maintained by the SFPUC after acceptance.

8.4 Phases for Potable Water System Construction

The Developer will design and install the new potable water system in advance of or in phases to match the Blocks of the Project, per the Phasing Plan in the DA. The amount of the existing system replaced with each Block may be the minimum necessary to serve the Block. The new Block will connect to the existing systems as close to the edge of the Block area as possible while maintaining the integrity of the existing system for the remainder of the development. Repairs and/or replacement of the existing facilities necessary to serve the Block will be designed and constructed by the Developer.

Utility Master Plans will be submitted to the SFPUC and SFPDW for review and approval as outlined in Section 13.

The SFPUC will be responsible for maintenance of existing potable water facilities. The SFPUC will be responsible for the new potable water facilities once construction of the Block or new potable water facility is complete and accepted by the SFPUC. Impacts to improvements installed with previous Blocks of development due to the designs of new Blocks will be the responsibility of the Developer

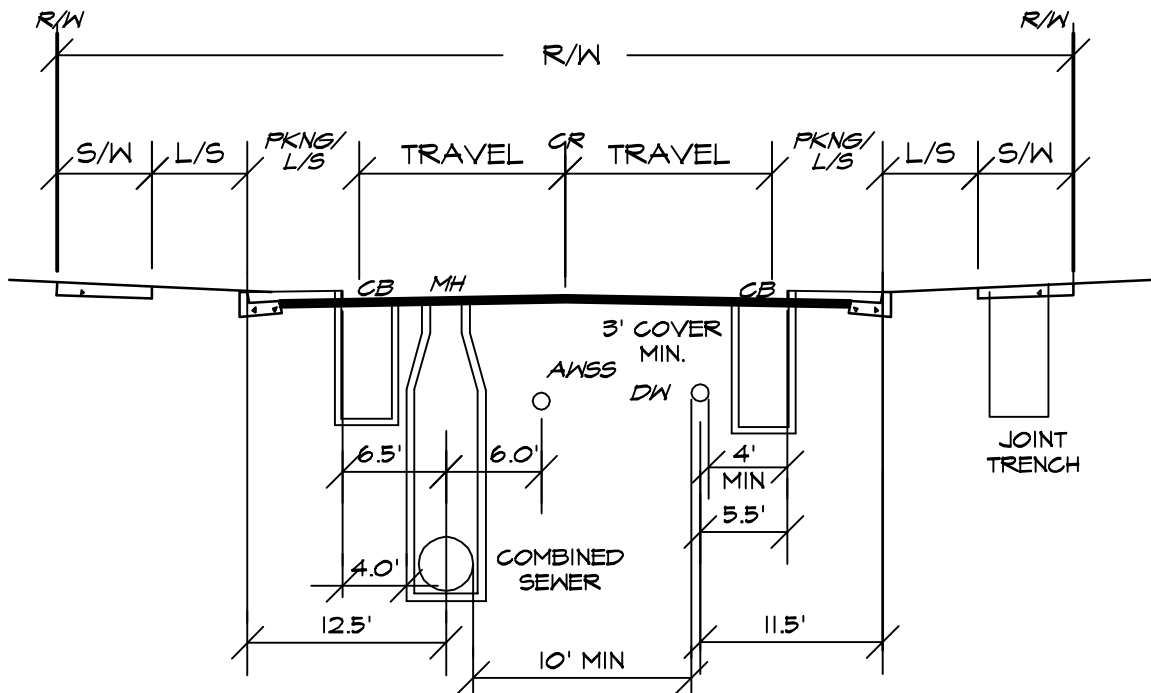
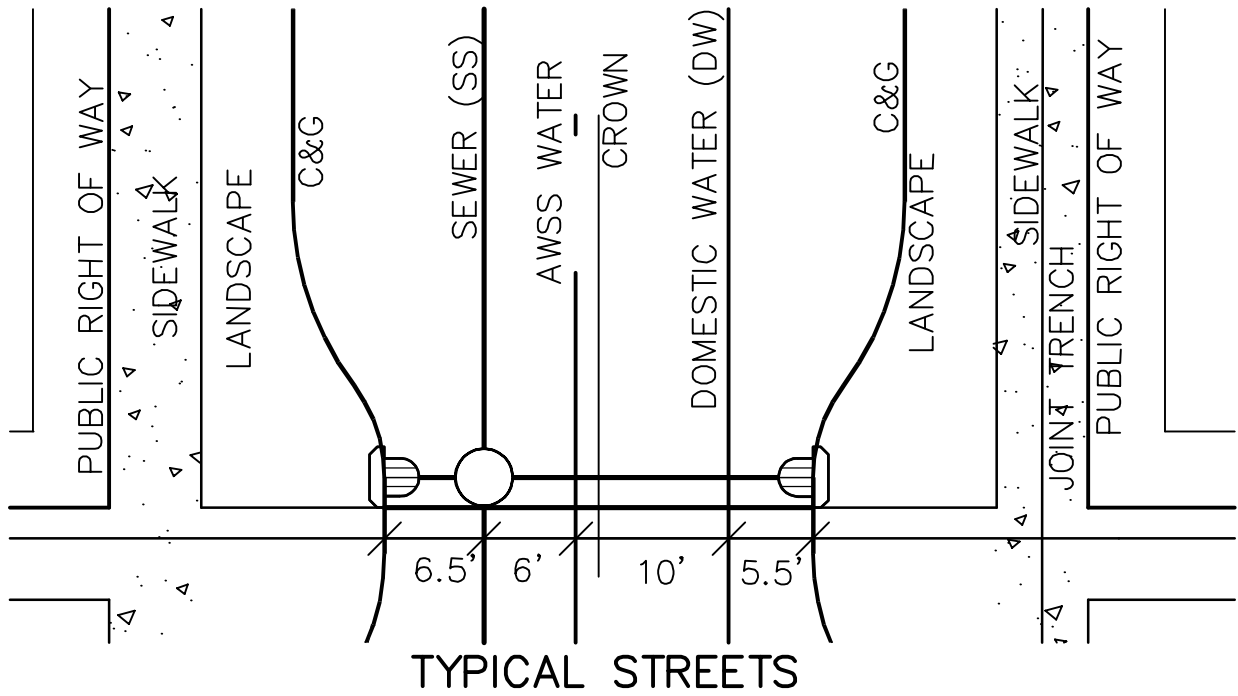


Figure 8.2 Typical Utility Sections within Public Streets

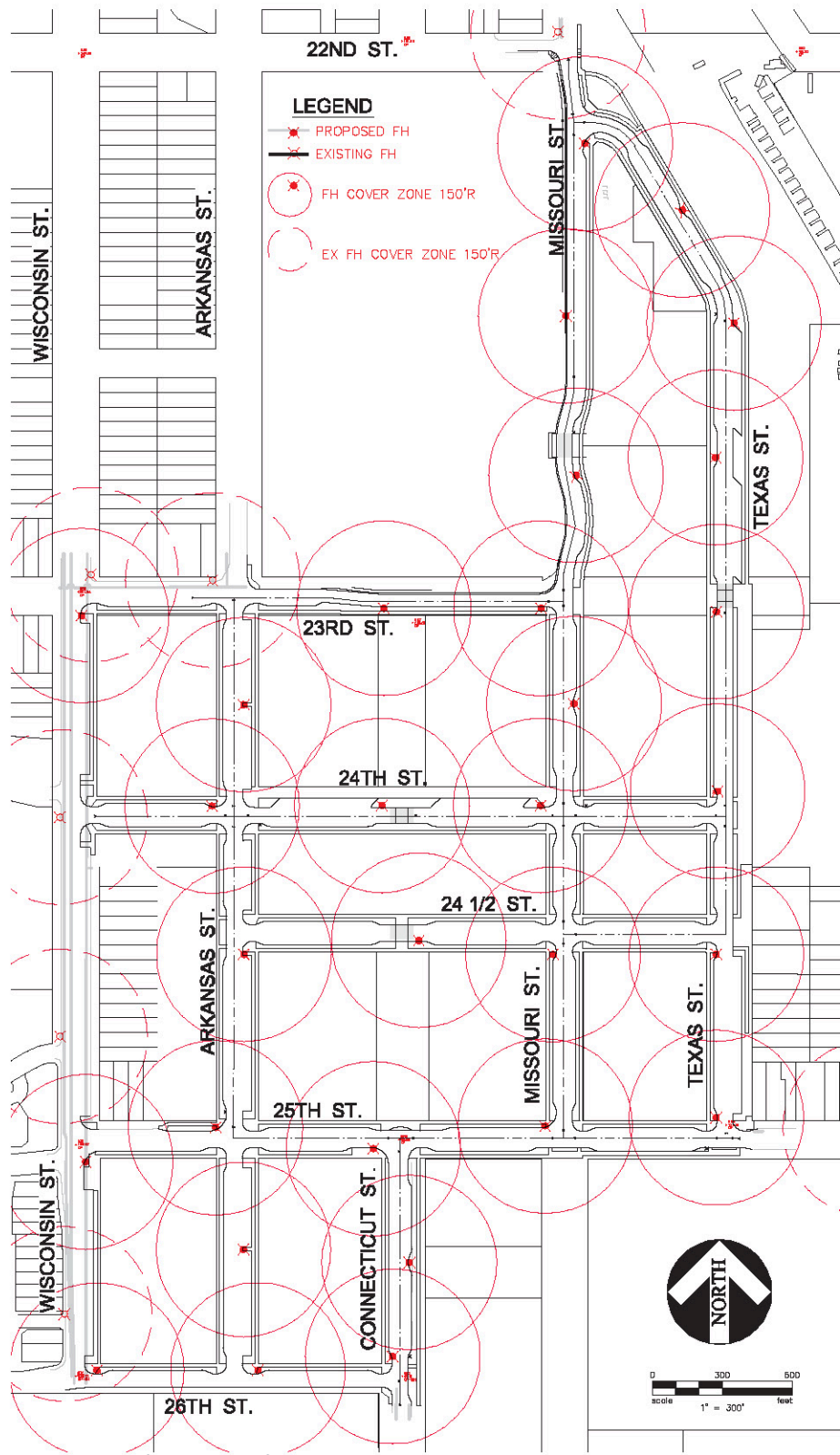


Figure 8.3 Conceptual Fire Hydrant Locations

9. COMBINED SEWER SYSTEM

9.1 Existing Combined Sewer System

The area of Potrero below 23rd street drains in lines ranging from 8" to 15" before exiting the site in an 18" in Connecticut. The existing Potrero Annex area drains in lines range from 12" to 21" before leaving the site to the east in the 23rd Street right of way. The exiting lines are smaller (12") because it is so steep it has enough hydraulic capacity. After exiting the site, the combined sewer runs under city streets until it ultimately reaches the treatment plant.

9.2 Proposed Combined Sewer System

9.2.1 Proposed Sanitary Sewer Demands

Project sanitary sewer demands conservatively assume a 95% return on water demands resulting in an Average Daily Dry Weather Flow (ADWF) of approximately 247,000 gallons per day (gpd) based on the 260,000 gpd for water in the EIR. A Combined Sewer Master Plan that outlines the Project's methods for calculating the flow demands will be submitted to the SFPUC for review and approval as outlined in Section 13. Applying a peaking factor of 3 to the ADWF, the project is anticipated to generate a Peak Dry Weather Flow (PDWF) of 741,000 gpd. As recommended by the Subdivision Regulations, an Inflow and Infiltration rate (I&I) of 0.003 cubic feet per second (cfs) 1939 gpd) per acre is added to the PDWF to calculate the Peak Wet Weather Flow (PWPF). Including the project I&I of 73,682 gpd, the anticipated PWPF for the project is approximately 814,682 gpd.

9.2.2 Proposed Combined Sewer Capacity

Preliminary hydrology models for the entire site will be developed and provided to the City as part of the Tentative Map approval process to confirm the combined sewer system designs and capacity. An analysis of the impacts of the proposed development demands will be reviewed as part of the Combined Sewer Master Plan review and approval process outlined in Section 13.

9.2.3 Proposed Combined Sewer Design Basis

The proposed combined sewer system will be designed in accordance with the City of San Francisco Subdivision Regulations (2015 Subdivision Regulations) or SFPUC Wastewater Utility Standards, as appropriate. Piping systems will be designed to convey the 5-year storm event inside the combined sewer infrastructure with overland release of the 100-year 90-minute storm conveyed between the top of curb elevations of the streets. Where sewer ejector pumps, diversion line, or interceptors are incorporated into the private development parcel utility system designs, the sewer demands shall be included in the hydrology calculations for sizing combined sewer mains. If pumps, interceptors or diversion lines are not included, the sewer demands shall not be included in the sizing calculations for the combined sewer mains per the City Subdivision Regulations. Where sewer ejector pumps, diversion line, or interceptors are incorporated into the private development parcel utility system designs they will be owned and maintained by the private parcel owner.

9.2.4 Proposed Combined Sewer Design Criteria

As documented in the Subdivision Regulations or SFPUC wastewater utility standards, as appropriate, proposed 6-inch to 21-inch pipes will be constructed from ASTM C-700 Extra Strength Vitrified Clay Pipe (VCP) with 24-inch to 36-inch pipe constructed from ASTM C-700 Extra Strength VCP. High density polyethylene (HDPE) pipe SDR-17 or better will be used in place of VCP where approved by the Director of Public Works and with the consent of the SFPUC. HDPE pipe requires a different bedding than VCP, the bedding will also need to be approved by SFPUC. HDPE larger than 12-inch shall be mandrel tested.

Proposed city main sewers within the development will be constructed on approved crush rock bedding. The minimum residential and commercial service lateral size is 6 inches and 8 inches, respectively. Laterals will have an air vent and trap. Manhole covers will be solid with manhole spacing set at a maximum distance of 300 to 350 feet and at changes in size, grade or alignment. Stormwater inlets will be installed per the Subdivision Regulations or SFPUC wastewater utility standards and outside of the curb returns, crosswalks, accessible passenger loading zones and accessible parking spaces, where feasible.

A minimum cover of 6 feet will be provided on top of mains within public streets, unless a reduced cover depth of up to 4-feet is approved by the Director of Public Works with the consent of the SFPUC. Pipe slopes will be designed between minimum and maximum values and the diameter shall have sufficient capacity to carry the design flow when running half full based on depth ($d/D = 0.50$). Mains larger than 18 inches shall have sufficient capacity to carry the design flow when running 0.75 full based on depth ($d/D = 0.75$). Pipes will be sized such that the d/D will be 0.5 for Average Dry Weather Flows and 0.75 for Peak Wet Weather Flows. Freeboard Requirements will conform to the City of San Francisco Subdivision Regulations or SFPUC wastewater utility standards. The minimum freeboard requirement should take precedence over the filling ratio (d/D) for design flow conditions. Unless approved otherwise by the SFPUC, the slope of the main sewer will achieve a minimum velocity of 2 ft/sec under average flow conditions. Combined sewer mains will be designed such that the maximum designed sanitary flows are less than 10 ft/sec.

Vertical and horizontal separation distances between adjacent combined sewer system, potable water, and dry utilities will conform to the requirements outlined in Title 22 of the California Code of Regulations and the State of California Department of Health Services Guidance Memorandum 2003-02. Where feasible, the combined sewer will be located in the center of the proposed public streets per Subdivision Regulations. As shown in Exhibit 8.2 and as required in many locations within the Project, the combined sewer will be offset from the center of the street to ensure that adjacent water lines can be placed outside of the proposed bulbouts while maintaining the required health code separation clearances. The combined sewer will be located within the public street pavement such that the outside wall is a minimum of 4-foot clear from the face-of-curb, including bulb-outs and a minimum of 5-feet clear from a proposed tree trunk. The outer edge of combined sewer manholes will a minimum of 4' from face of curb. Final approval of the combined sewer location within the street section and variances is subject to SFPUC approval during the Combined Sewer Master Plan and Project construction document review process.

9.2.5 Proposed Sewer and Combined Sewer Collection System

The proposed replacement combined sewer system is identified schematically on Figure 9.1. Flows from existing combined sewers that serve areas beyond the project boundaries will remain combined as they pass through the project. The combined sewer system will be designed and constructed by the Developer. Street sewers including street drainage within the new City street rights-of-way will be reviewed and approved by the SFPUC. The new combined sewer system will be maintained and owned by the SFPUC, upon construction completion and improvement acceptance by the SFPUC. The proposed system will include City standard stormwater drainage inlets and sanitary sewer laterals connected by a system of 12-inch to 36-inch gravity combined sewer mains.

The combined sewer system will connect to the existing combined sewer at three locations – Connecticut Street on the south side of the project, 25th Street at the east side of the project and the 23rd Street right of way at the east side of the project. See Figure 8.2 for the approximate combined sewer system depth and its relationship to other adjacent utilities.

9.3 Phases for Combined Sewer System Construction

For each phase, the combined sewer system will be designed for the flows generated by that particular phase, and any existing flows or flows from future phases that will flow through the particular phase. Where construction abuts existing lines that are to remain, a condition assessment will be required for the existing pipes before and after construction of the phase. All sewers, manholes, laterals and catch basins shall require testing and videoing prior to date completion. Videoing shall be in NASSCO PACP format.

A Combined Sewer Master Plan will be submitted to the SFPUC for review and approval as outlined in Section 13.

Upon the Developer offering and the City accepting a newly completed public street, the SFPUC will be responsible for the operation and maintenance of the new combined sewer system in the street.

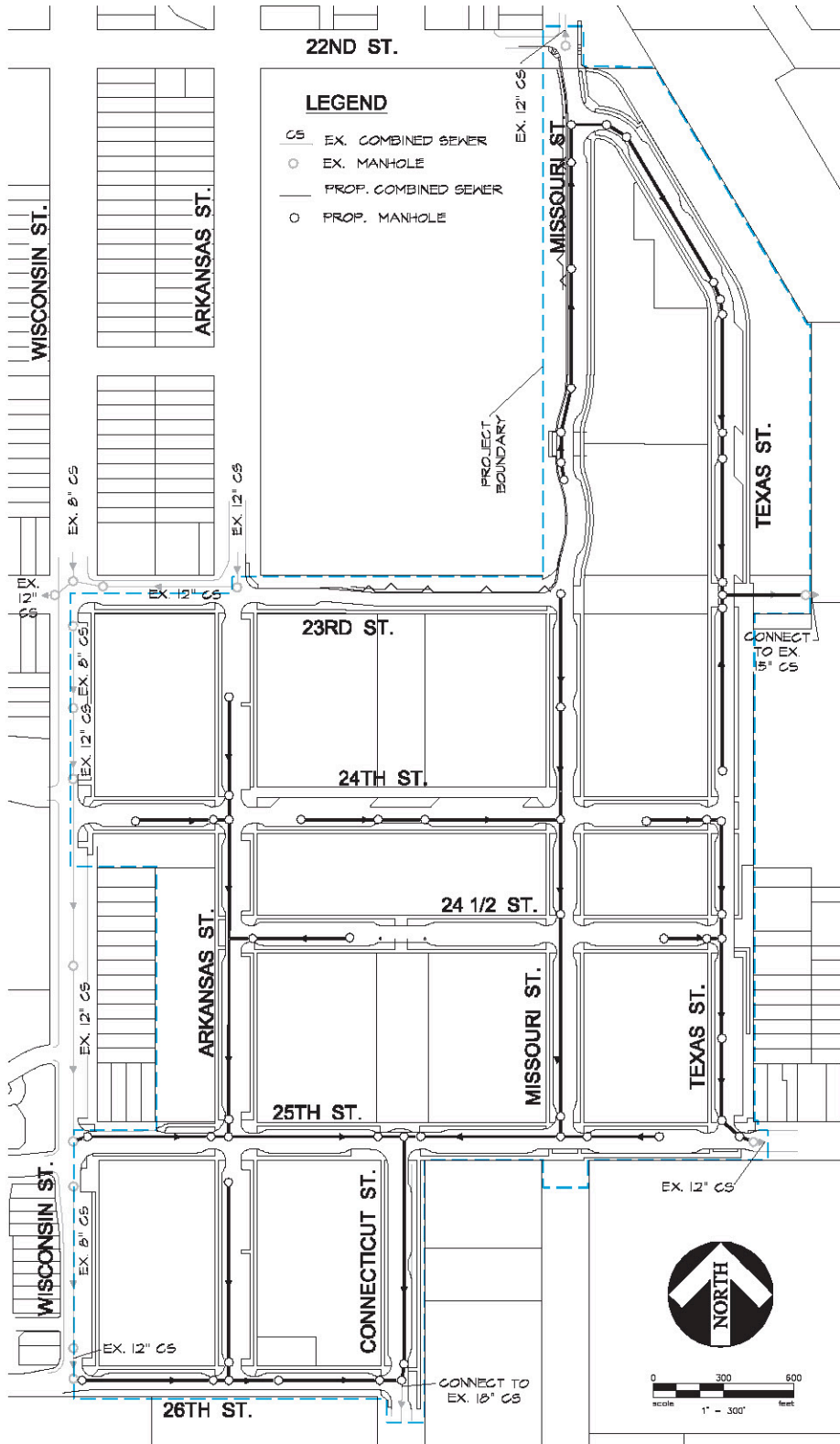


Figure 9.1 Conceptual Combined Sewer System

10. AUXILIARY WATER SUPPLY SYSTEM (AWSS)

10.1 Existing AWSS infrastructure

The San Francisco Public Utilities Commission (SFPUC), in cooperation with the San Francisco Fire Department (SFFD), owns and operates the Auxiliary Water Supply System (AWSS), a high-pressure non-potable water distribution system dedicated to fire suppression that is particularly designed for reliability after a major seismic event. Currently, AWSS infrastructure does not exist within or directly adjacent to the project site.

10.2 AWSS Regulations and Requirements

New developments within the City and County of San Francisco (CCSF) must meet fire suppression objectives that were developed by the SFPUC and SFFD following a major seismic event. The SFPUC and SFFD work with the Developer to determine post-seismic fire suppression requirements during the planning phases of the project. Requirements will be determined based on increase in building density, fire flow and pressure requirements, Citywide objectives for fire suppression following a seismic event, and proximity of new facilities to existing AWSS facilities. AWSS improvements will be located in public right-of-way, on CCSF property, or on private property within a public easement, as approved by SFPUC on a case-by-case basis.

10.3 Conceptual AWSS Infrastructure

To meet the SFPUC and SFFD AWSS requirements, the development may be required to incorporate infrastructure and facilities that may include, but are not limited to:

- Multiple underground water storage cisterns, typically 75,000 gallons each;
- Seismically reliable high-pressure water piping and hydrants with connection to existing AWSS distribution system;
- Independent network of seismically reliable low-pressure piping and hydrants with connection to existing potable water distribution system at location that is determined to be seismically upgraded by SFPUC;
- Portable water supply system (PWSS), including long reaches of hose and equipment mounted on dedicated trailers or trucks.

For the Potrero HOPE SF development project, a high-pressure water piping and hydrant system will be install by the developer and approved by the SFPUC. It will be the responsibility of the City of San Francisco to connect the new system to the existing AWSS distribution system. Existing AWSS system in located on Cesar Chavez Street at the bottom of Connecticut and on Pennsylvania Street at the bottom of 25th Street. Final designs and a phasing plan of the AWSS solution for the project site and/or selection of a PWSS will be determined by the SFPUC and SFFD in consultation with the Developer.

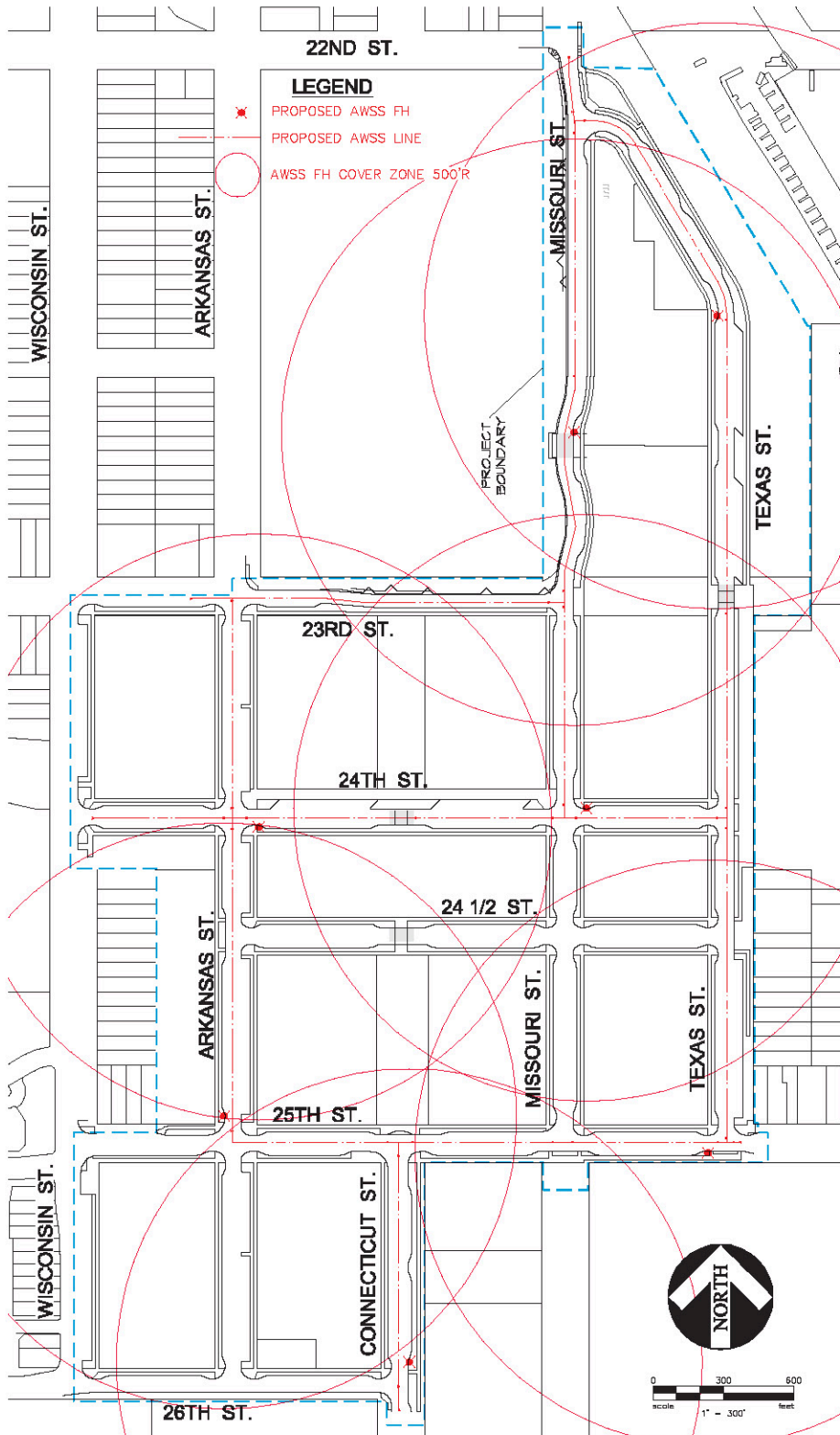


Figure 10.1 AWSS System Diagram

11. Storm Water Management

11.1 Existing Stormwater Management System

The existing Potrero Terrace and Annex is approximately 50% impervious due to the existing streets, buildings and walkways. Stormwater is collected throughout the site and ultimately the combined sewer leaves the site at 3 locations – Connecticut Street, 25th Street to the east, and the 23rd Street right of way. The existing site did not include any stormwater management systems to reduce runoff volumes.

11.2 Proposed Stormwater Management System

11.2.1 San Francisco Stormwater Design Guidelines

The City of San Francisco SFPUC stormwater management requirements document is the regulatory guidance describing requirements for post-construction stormwater management. The SFPUC stormwater management requirements call for projects in combined sewer areas to follow LEED 6.1 which requires a project to implement a stormwater management plan that prevents the post-development discharge rate and quantity from exceeding the pre-development condition, when the existing site surface is 50% or less impervious. For projects where more than 50% of the existing site surface is impervious, the project is required to implement a stormwater management plan that results in a 25 percent decrease in the total volume and peak flow of stormwater runoff from the 2-year 24-hour design storm.

11.2.2 Baseline Assumptions and Proposed Site Methodology

Per a determination by SFPUC, the development will use design criteria for stormwater management based on the existing site conditions for 50% impervious surfaces for the entire project area, which means that it will maintain the pre-development conditions for discharge rate and quantity. The design criteria will then be applied on a block by block basis, with each block also responsible for the area of the half-width or whole-width of the public street that is adjacent to it. Each block will be responsible for installing and maintaining the stormwater management measures that allow it to meet the overall stormwater performance measure for the block area and associated adjacent public right of way. See figure 11.1 for the block by block drainage management areas. Any BMP developed within and for each phased Block will be maintained by the developer via the requirements of the Stormwater Management Ordinance. Any stormwater BMP proposed to manage public right of way stormwater runoff must be shown in the stormwater management master utility plan. It is currently anticipated that stormwater management methods will not be feasible in the public right of way. It will be the responsibility of the developer of each block to determine if any stormwater management methods are feasible within the public right of way, and, if they are, to develop a maintenance program approved by SFDPW and SFPUC. For common areas between development blocks such as the Connecticut and 23rd Street stairways, design, installation and maintenance of the common area stormwater management will be shared by the blocks adjacent to the common areas.

11.3 Stormwater Control Plans

Due to the block-by-block approach to stormwater management, the developer of each block will be required to prepare and implement a Stormwater Control Plan (SCP) for the block which shall include on-site stormwater management facilities sized to manage the block itself and the associated adjacent ROW, or common area. The developer will be required to prepare and implement a SCP that also includes any adjacent public ROW stormwater management facilities shown within the approved Stormwater MUPs. Each SCP will be prepared in compliance with SFPUC stormwater management requirements and the Potrero Stormwater Management Master Plan. The selected modeling methodology will be per the SFPUC Accepted Hydrologic calculation methods. The Stormwater Management Master Plan for the public improvements will be submitted for review and approval as outlined in Section 13. In the event that public right of way development occurs in advance of individual block development, stormwater management for public streets may be deferred until the construction of the adjacent block occurs.

11.4 Phases for Stormwater System Construction

The Developer will design and install the new stormwater management systems to match the Blocks of the project. Permanent stormwater management requirements as outlined in the SFPUC stormwater management requirements will be met at the completion of each Block and/or phase of the Project. If any interim measures are necessary in shared areas between blocks, they would be installed to meet the SFPUC stormwater management requirements until the adjacent block develops and can complete the permanent measures.

At all phases of the development, the Developer must provide functioning and adequate stormwater management in compliance with the SFPUC's post-construction stormwater management requirements and the Stormwater Design Guidelines. The Developer must complete the construction of the stormwater management improvements required for each Block prior to receiving a temporary certification of occupancy for that block. If a future park will include stormwater controls necessary for a particular phase of development or future parcel to meet the stormwater management requirements of that development, those controls shall be installed prior to issuance of the temporary certificate of occupancy for any building within that Block. Permanent or interim centralized stormwater management facilities necessary to achieve stormwater management compliance within a development phase will be constructed and operational prior to or in conjunction with that phase. Maintenance of the stormwater management systems will be the responsibility of the developer of each block. Interim stormwater Best Management Practices (BMPs) implemented as part of the on-site remediation for a multi-block phase will be preserved and maintained on any undeveloped parcels by the Master Developer who created the parcels.

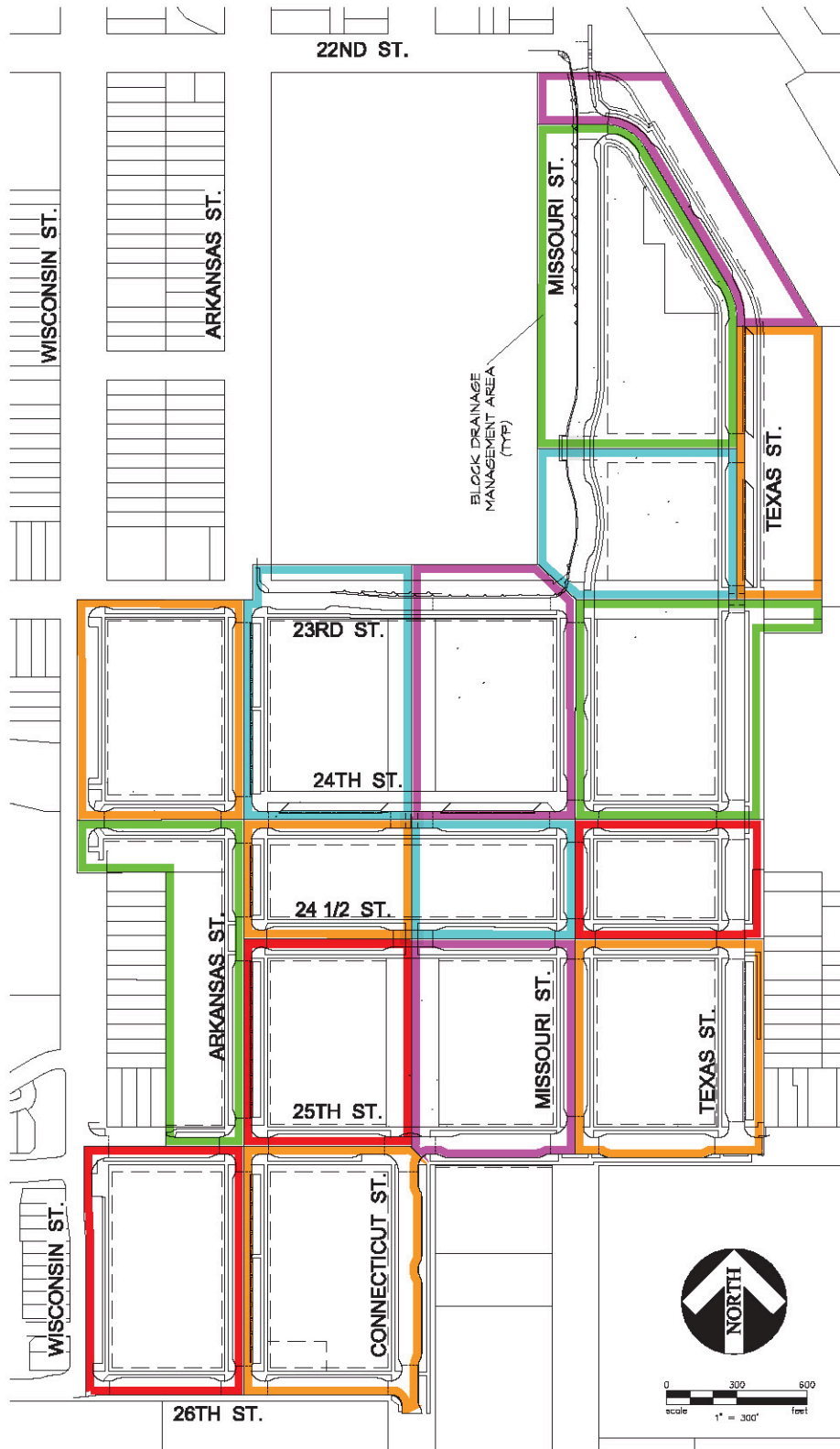


Figure 11.1 Conceptual Stormwater Master Plan

12. Dry Utilities

12.1 Existing Electrical, Gas, and Communication Systems

On Wisconsin, Missouri, Texas, 23rd, 25th, and 26th Streets adjacent to the Potrero HOPE SF site, there are existing electrical, gas, and communication systems. Most of the electrical and communication lines are overhead on these streets.

12.2 Project Power Providers and Requirements

Chapter 99 of the City of San Francisco Administrative Code requires the City to consider the feasibility of supplying electricity to new development projects. SFPUC had determined that they will provide electric service for the project. Such service shall be provided by the City on terms and conditions generally comparable to, or better than, the electric service otherwise available to the project.

12.3 Proposed Joint Trench

The proposed Joint Trench is identified schematically on Figure 12.1. Work necessary to provide the joint trench for dry utilities, typically installed within in public streets and adjacent sidewalk area, consists of trench excavation and installation of conduit ducts for electrical, gas, and communication lines. Additionally, utility vaults, splice boxes, street lights and bases, wire and transformer allowance, and backfill are included. Electric and power systems will be constructed per the applicable standards of the agency or company with controlling ownership of said facilities with street lighting infrastructure constructed per City standards. The utility owner/franchisee (such as SFPUC, PG&E, AT&T, Comcast and/or other communication companies) will be responsible for installing facilities such as transformers and wire. All necessary and properly authorized public utility improvements for which franchises are authorized by the City shall be designed and installed in the public right-of way in accordance with permits approved by SFPUC. Joint trenches or utility corridors will be utilized wherever allowed. The location and design of joint trenches or utility corridors in the right-of way must be approved by SFPUC during the subdivision review process. The precise location of the joint trench in the right-of-way will be determined prior to recording the applicable Final Map and identified in the project construction documents. Nothing in this Infrastructure Plan shall be deemed to preclude the Developer from seeking reimbursement for or causing others to obtain consent for the utilization of such joint trench facilities where such reimbursement or consent requirement is otherwise permitted by law.

12.4 Phases for Dry Utility Systems Construction

The Developer will design and install the new joint trench systems in phases to match the Blocks of the project. The amount of the existing system replaced with each Block will be the minimum necessary to serve the Blocks. The Block will connect to the existing systems as close to the edge of the new Block as possible while maintaining the integrity of the existing system. Repairs and/or replacement of the existing facilities necessary to serve the Block will be designed and constructed by the Developer.

The service providers will be responsible for maintenance of existing facilities until replaced by the Developer and will be responsible for the new power facilities once the Block or new power facility is complete and accepted by the utility provider.

Impacts to improvements installed with previous phases of development due to the designs of the new phase will be the responsibility of the Developer and addressed prior to approval of the construction drawings for the new phase.

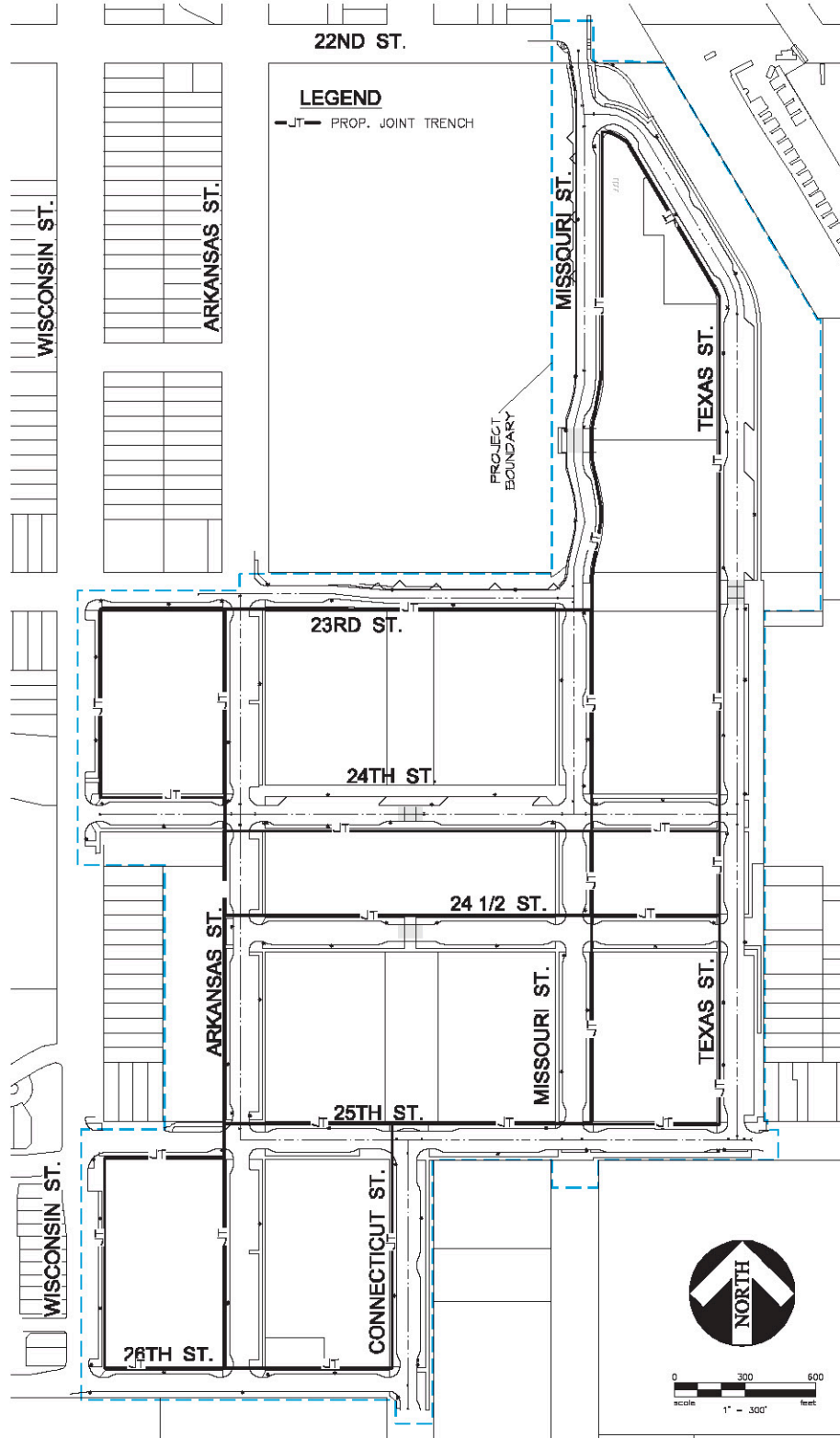


Figure 12.1 Conceptual Joint Trench Plan

13. FUTURE DOCUMENTATION SUBMITTAL REQUIREMENTS

Following City approval of this Master Infrastructure Plan (MIP), the Developer shall submit the following subsequent infrastructure related design documents to the City for review and approval to ensure that all proposed infrastructure improvements, including public water, wastewater, stormwater management, dry utilities (including SPUC power) and public right-of-way improvements meet all requirements and standards of the City.

13.1 Outline of Submittals

Master Infrastructure Plan (MIP)

The MIP is an accompaniment to the Development Agreement (DA). The MIP outlines the infrastructure responsibilities of the City and the Developer and defines the site and infrastructure improvements required to construct the project.

Master Utility Plans

Supplemental to the Master Infrastructure Plan, the developer shall submit a set of Master Utility Plans prior to the 60% Construction Document Submittal for *Phase 1 Public Improvement Plans*.

The Utility Master Plans will include the following:

- Infrastructure/Grading Master Phasing Plan
- PUC/PG&E Power System Description and Phasing Plan
- Potable Water Master Plan
- Auxiliary Water Supply System (AWSS) Plan
- Combined Sewer Master Plan
- Stormwater Management Master Plan
- Grading and Overland Release Master Plan

Development Phase Design Review Application

The Phase Application is intended to ensure that all buildings within a phase as well as new infrastructure, utilities, open space and all other improvements promote the purpose of the HOPE SF Program, Special Use District and meet the requirements of the Design Standards and Guidelines (DSG) and MIP documents.

Public Improvement Plans

Public improvement plans will be submitted for each phase in the form of Construction Documents. Document sets will be submitted at 30%, 60%, 95% and 100%.

13.2 Utility Master Plans

Following approval of the Master Infrastructure Plan but prior to the submittal of the 60% construction documents for Phase 1, the Developer shall submit Master Utility Plans to the SFPUC for review and

approval, as outlined below, that cover site wide infrastructure issues that were not detailed in the Master Infrastructure Plan. The Master Utility Plans shall generally include:

13.2.1 Infrastructure/Grading Phasing Plan

The Infrastructure/Grading Phasing Plan shall include conceptual grading and infrastructure utility maps for each phase showing how the proposed improvements will connect to existing and/or previous phase grades and utilities.

13.2.2 Power System Description and Phasing Plan

The descriptions shall include the following:

- Conceptual details showing all proposed points of connection with existing infrastructure as appropriate. Conceptual details showing proposed service connections to parcels.
- Written Description and figures showing any proposed underground structures in parcels or in the public ROW that were not covered in the approved infrastructure plan.
- Updated description and figures showing all proposed easements for future public infrastructure that were not covered in the approved infrastructure Plan.
- Updated description and figures showing project phasing.

13.2.3 Potable Water Master Plan

The descriptions shall include the following:

- Written description and figures showing the proposed pipe layout, sizes, materials, velocities and slopes that were not covered in the Infrastructure Master Plan
- Written description and figures showing all proposed pressure reducers or other nonpipe infrastructure assets or facilities proposed as part of the project.
- Conceptual details showing all proposed points of connection with existing infrastructure as appropriate. Conceptual details showing proposed service connections to parcels.
- Written Description and figures showing any proposed underground structures in parcels or in the public ROW that were not covered in the approved infrastructure plan.
- Updated description and figures showing all proposed easements for future public infrastructure that were not covered in the approved infrastructure Plan.
- Updated description and figures showing project phasing.
- Calculations that support the adequacy of the proposed pipe network.

13.2.4 AWSS Plan

The descriptions shall include the following:

- Written description and figures showing the proposed pipe layout, sizes, and materials that were not covered in the Infrastructure Master Plan
- Conceptual details showing all proposed points of connection with existing and proposed infrastructure as appropriate.
- Written Description and figures showing any proposed cisterns in parcels or in the public ROW that was not covered in the approved infrastructure plan.

- Updated description and figures showing project phasing.

13.2.5 The Combined Sewer Master Plan

The Master Plan shall include the following:

- A written description and figures demonstrating that a functioning wastewater infrastructure system is in place at all times and complies with all City laws, codes and regulations at all phases of development prior to full build out of the Project.
- Capacity Analysis for entire development including modeling (SWMM or equivalent) to demonstrate that the Project will provide adequate collection system capacity. The Analysis shall include detailed sanitary sewer and stormwater flows based on anticipated building usage and development plan, analyzing the impact of the project on downstream infrastructure, localized wet weather flooding; and combined sewer system surcharges into streets at full build out. The analysis shall include a detailed description of all assumptions and calculation methods used, including explanation and reference for selected peaking factors.
- A description of the methods used to estimate sewer flows for the project.
- A written description and figures outlining any proposals for variances to the SFPUC standards for the combined sewer location within the street section for review and approval of the SFPUC on a case-by-case basis.

13.2.6 Stormwater Management Master Plan

The Master Plan shall include the following:

- A table stipulating the Stormwater Management responsibility of each block. The table will show the area of each block and the Stormwater Management area for the block, which will include adjacent streets or common parcels as applicable.
- Conceptual details showing any proposed stormwater management controls, as appropriate.
- A project wide Maintenance Assessment of the maintenance required for the proposed Stormwater Controls as well as a description of the funding mechanism that will be in place to perform that maintenance.

13.2.7 Grading and Overland Release Master Plan

The Master Plan shall include the following:

- Written description and figures generally showing the overland flow path 100-year storm, outlet location and drainage boundaries that was not covered in the Conceptual Infrastructure Report.
- A hydrologic/hydraulic modeling analysis to demonstrate overland flow will be contained at full project build out as required in applicable codes and regulations. The analysis shall include all proposed surface improvements in the development phase that could impede overland flow paths in the ROW such as raised intersections, raised cross walks, curbsless street designs, bulb-outs, etc. If site designs cannot meet the SFPUC requirements for overland drainage release, alternative solutions will be developed during the master plan approval process that may include crossings at the street pavement level.

- A final geotechnical investigation that covers development of the public street rights-of-ways and parks for the entire project and demonstrate to the SFPUC that appropriate mitigations measures such as soil and foundation improvements will be constructed by the Developer to minimize differential settlement across the building parcel.

13.3 Public Improvement Plans/Construction Documents

Public Improvement Plans shall be submitted to the DPW Infrastructure Task Force for review.

Construction Documents will be submitted at 30%, 60%, 95% and 100% completion.

Construction Document Permit Applications shall include then following:

- The first set of improvement plans shall be submitted with Standard specifications for use with all subsequent improvement plan submittals. Subsequent improvement plans will comply with the approved project specifications and submit project specific specifications as needed to supplement the standard specifications.
- Proof of conformance with all infrastructure requirements outlined in the applicable City regulations, the MIP, MUP's or the phase applications.
- Proof of conformance with any mitigations identified in the phase application to alleviate any impact of the development project on downstream infrastructure, minimize localized wet weather flooding, minimize combined sewer system surcharges into streets, and safely contain overland flow.
- Proof of conformance with the stormwater management requirements applicable to the project at the time of submission including:
- Preliminary Stormwater Control Plan at conceptual design first construction document (60% construction document)
- Final Stormwater Control Plan at detailed design (95% construction documents)
- Proof of conformance with, the City's construction site runoff requirements including a Storm Water Pollution Prevention Plan/Erosion and Sediment Control Plan
- Details of the connection to existing, off-site infrastructure.

APPENDIX

Appendix A – Intersection Turning Radius Compliance

Appendix A illustrates the WB-40 Turning Template at all street intersections.

Appendix B – Existing Utilities (Full Size)

Appendix C – Vertical Clearance Diagrams

Appendix D – 11 x 17 Plan Figures

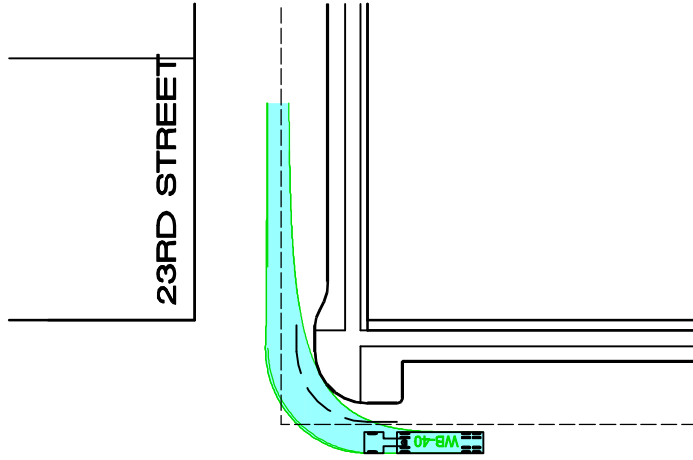
APPENDIX

Appendix A – Intersection Turning Radius Compliance

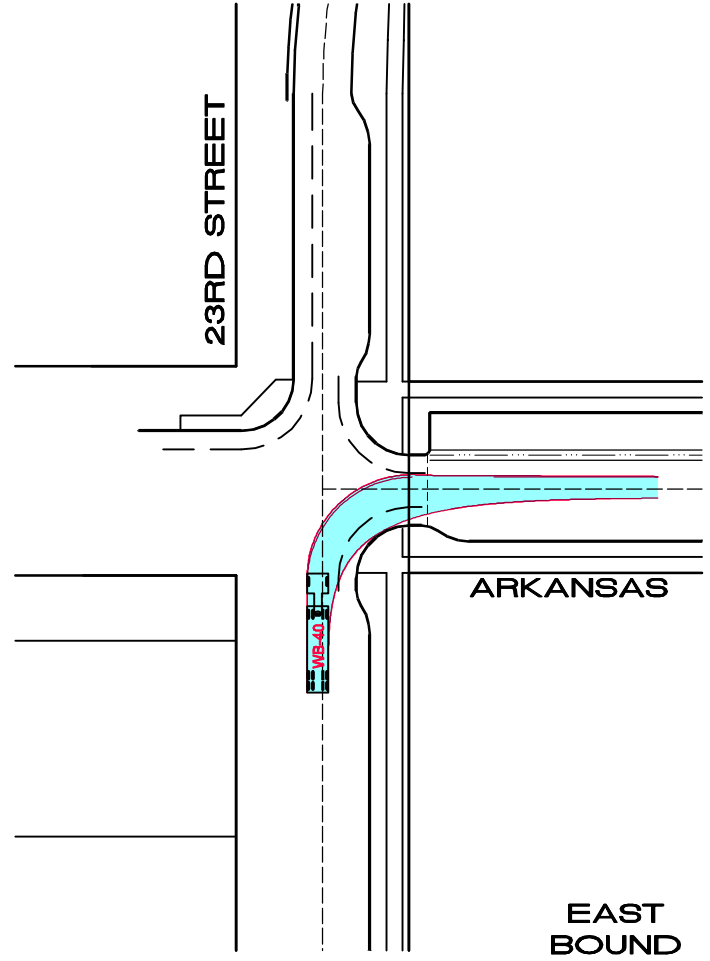
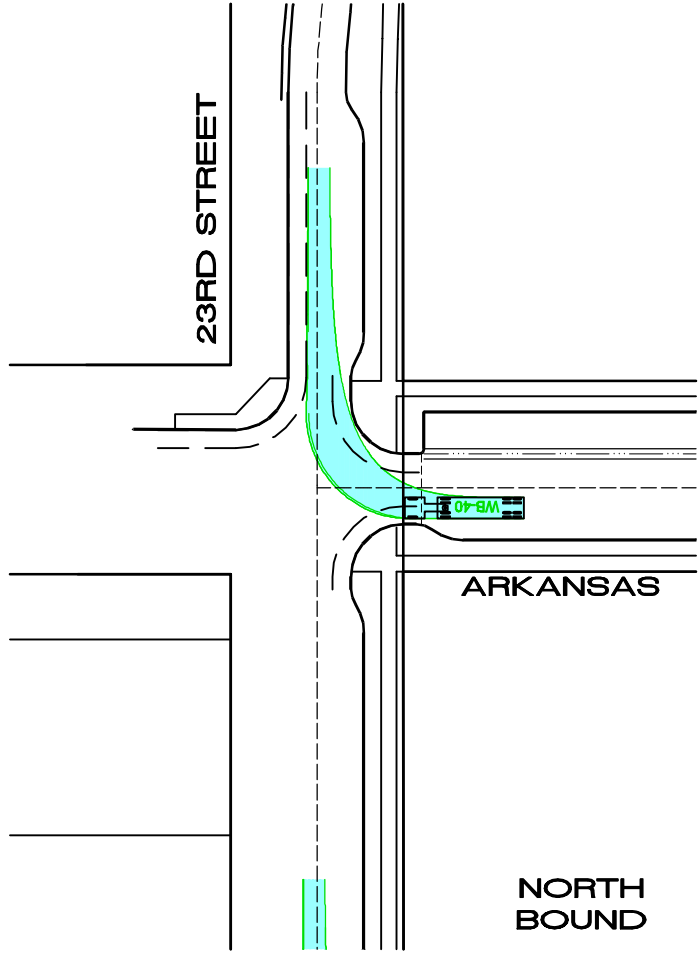
Appendix A illustrates the WB-40 Turning Template at all street intersections.

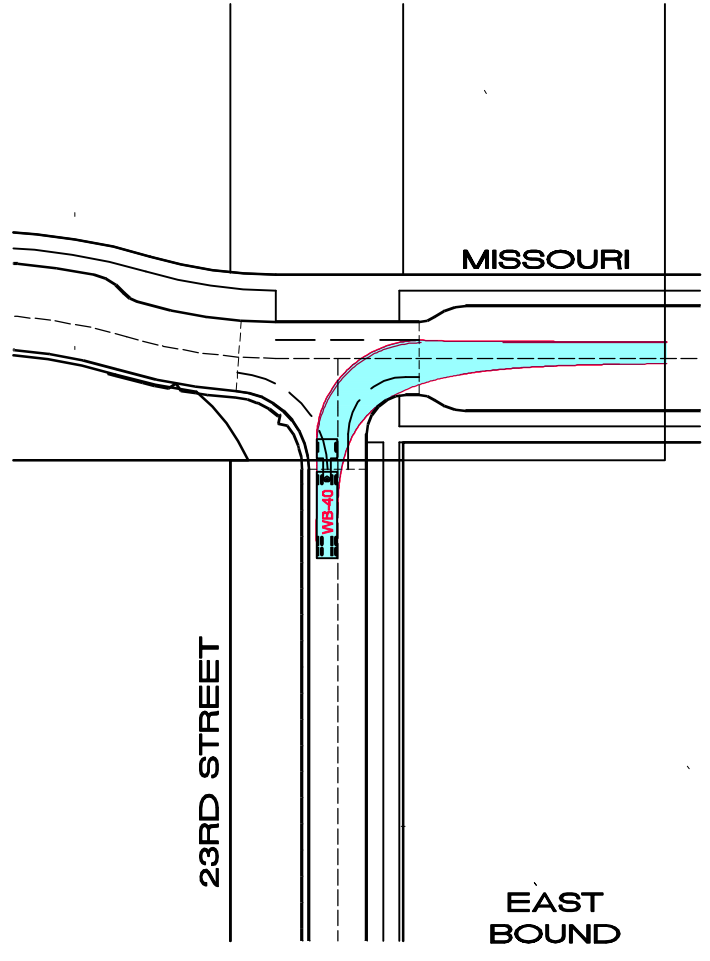
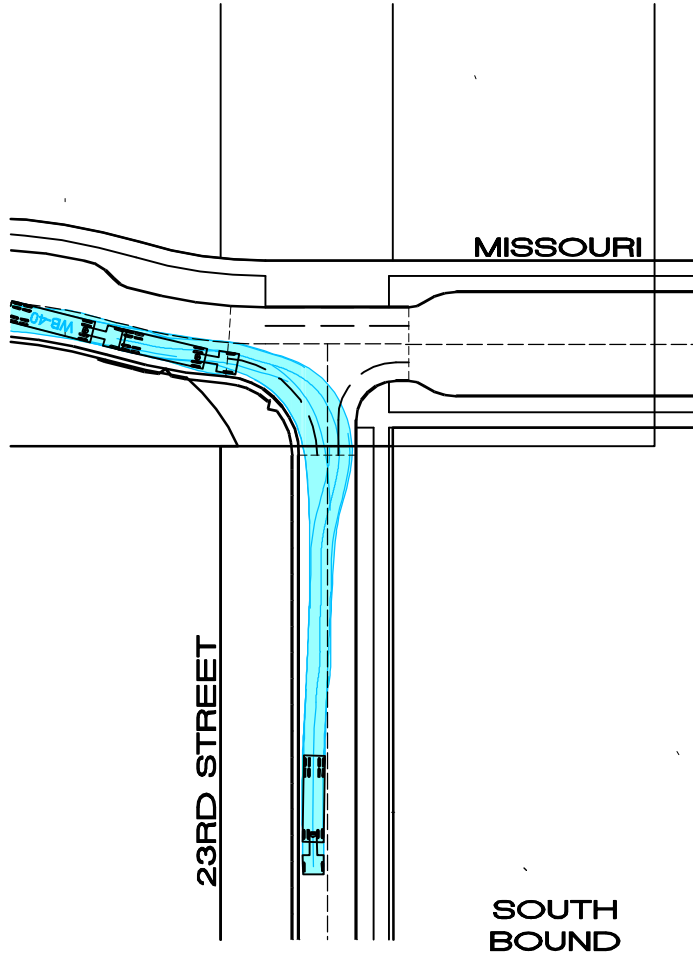
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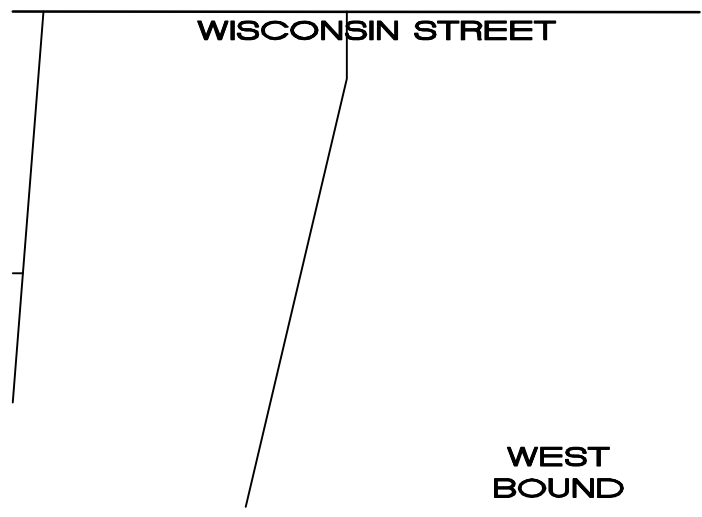
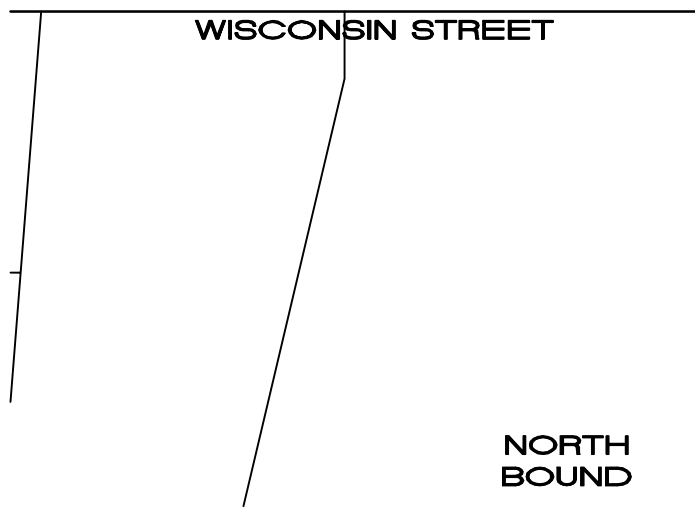
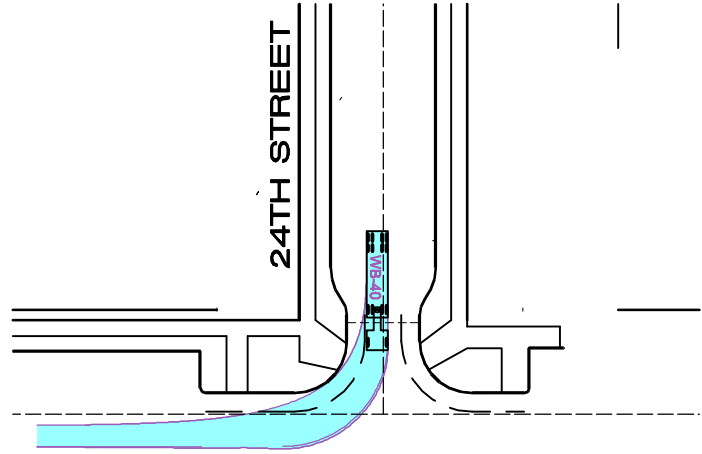
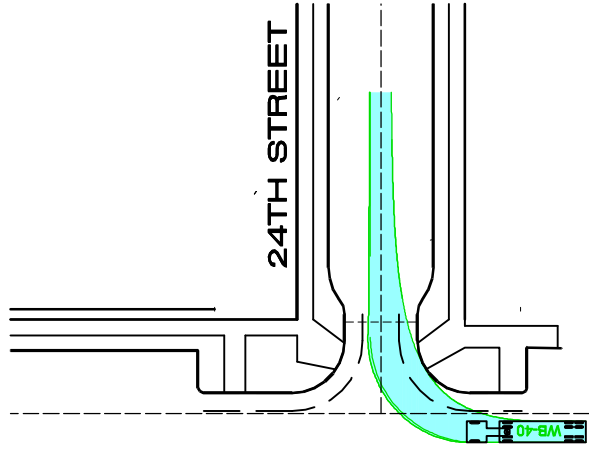
WB-40 TURNING TEMPLATES

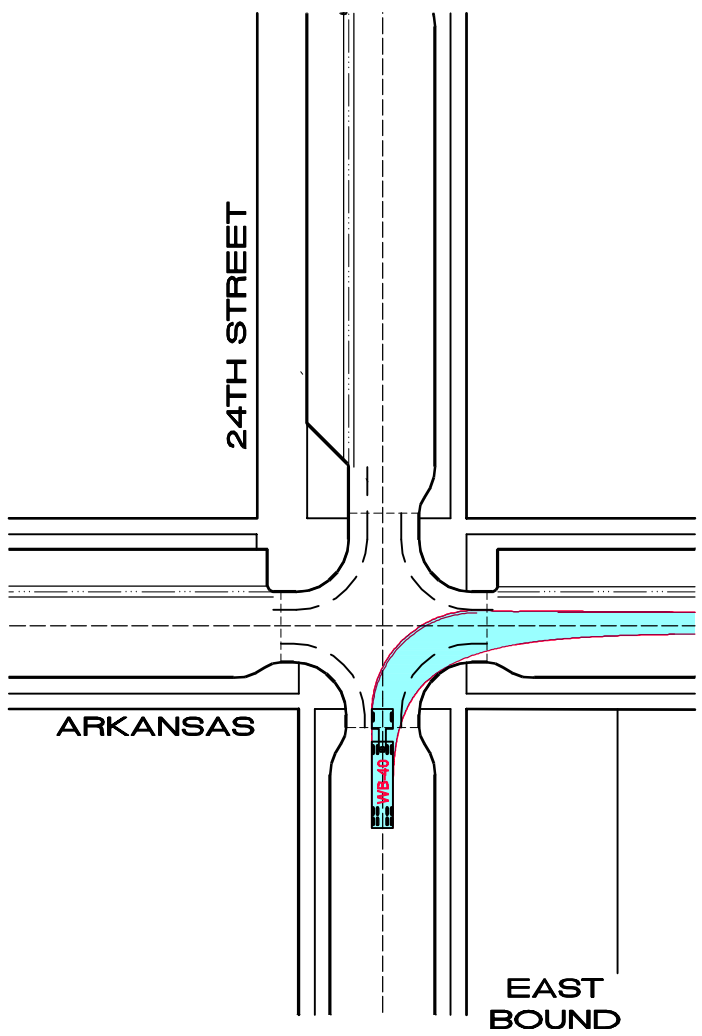
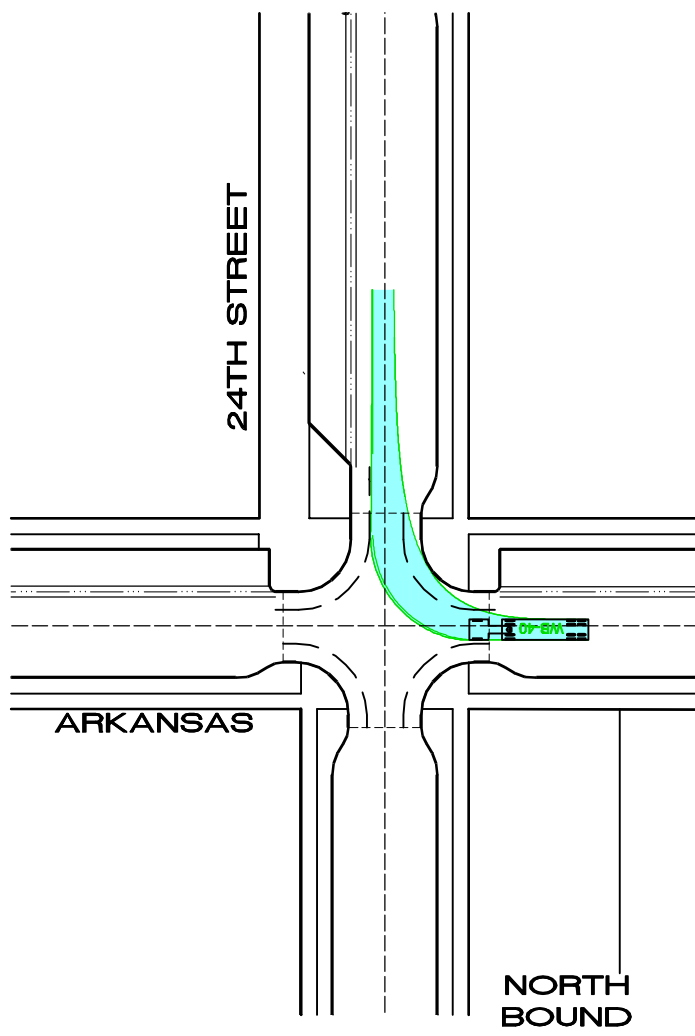
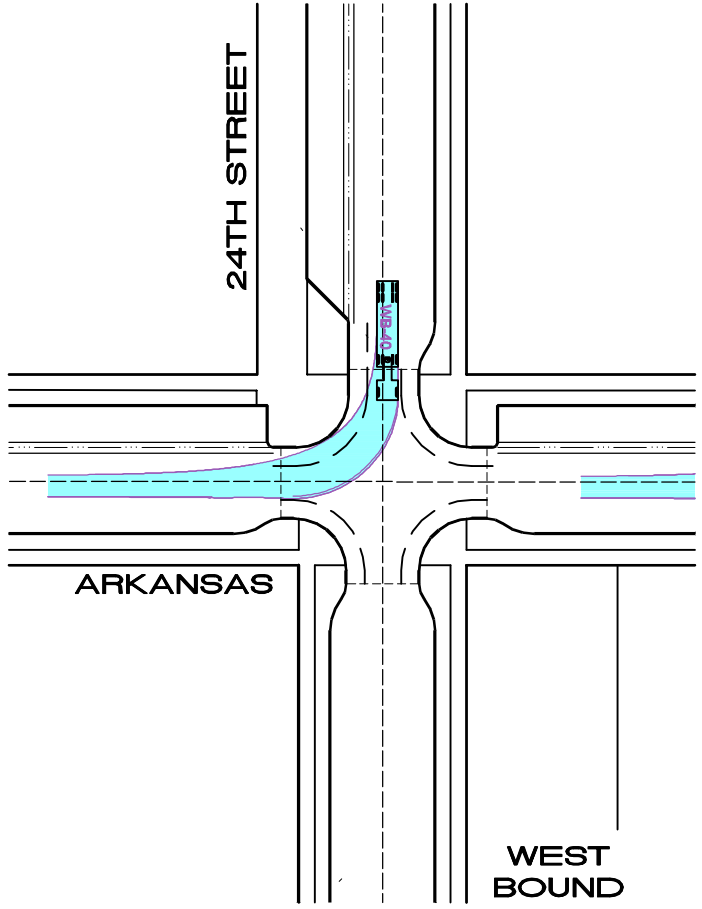
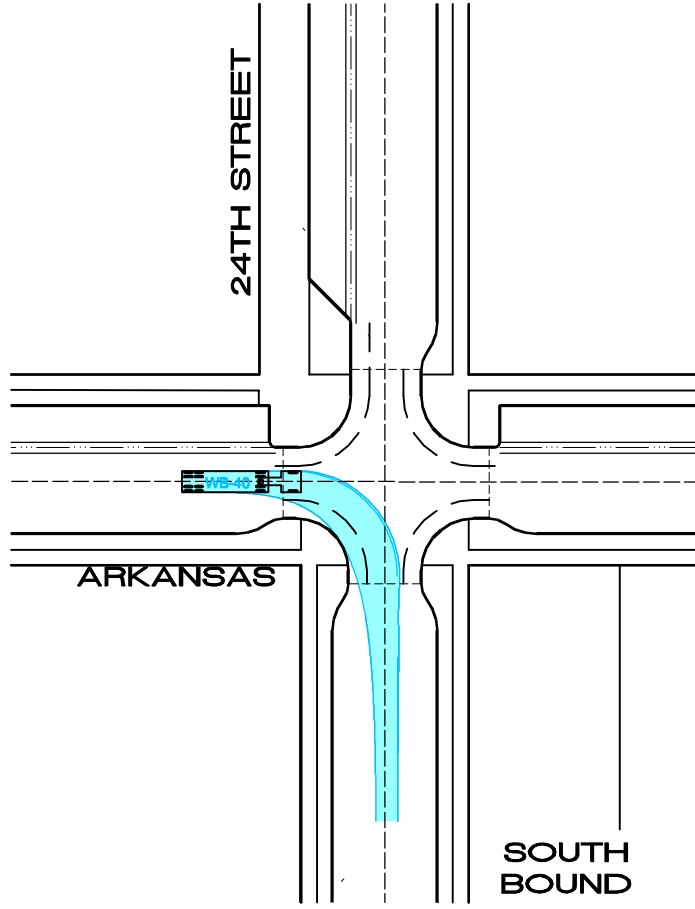


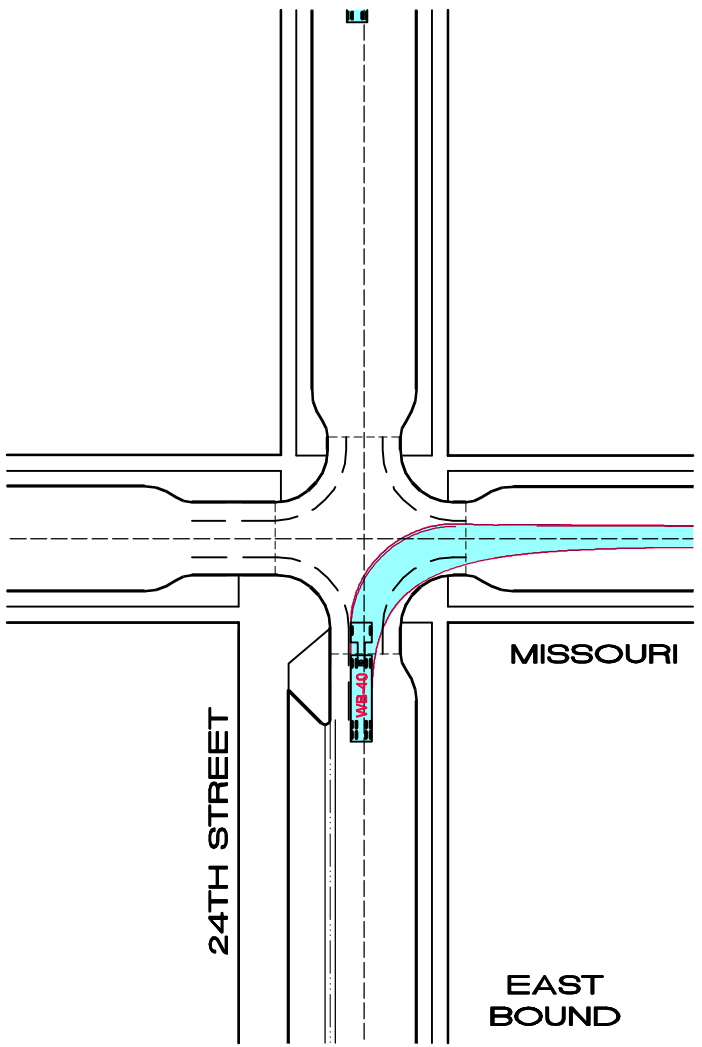
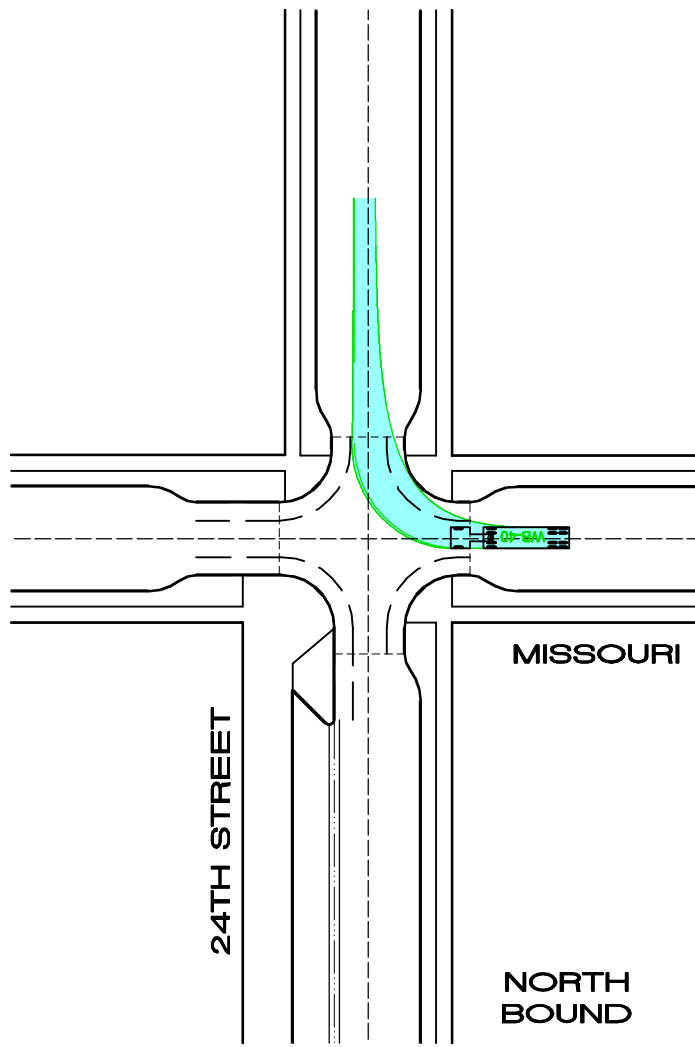
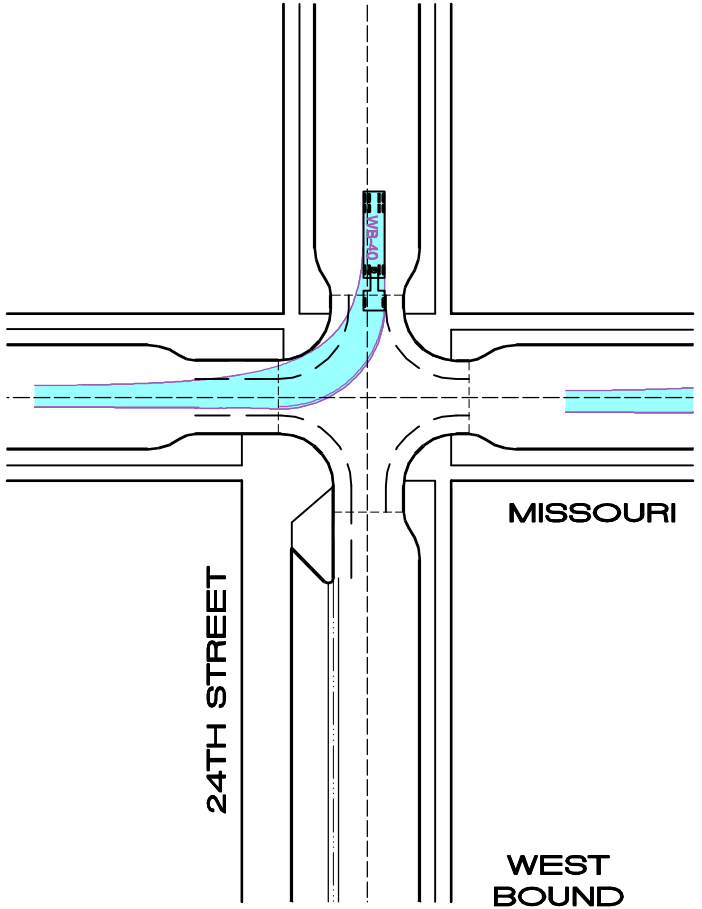
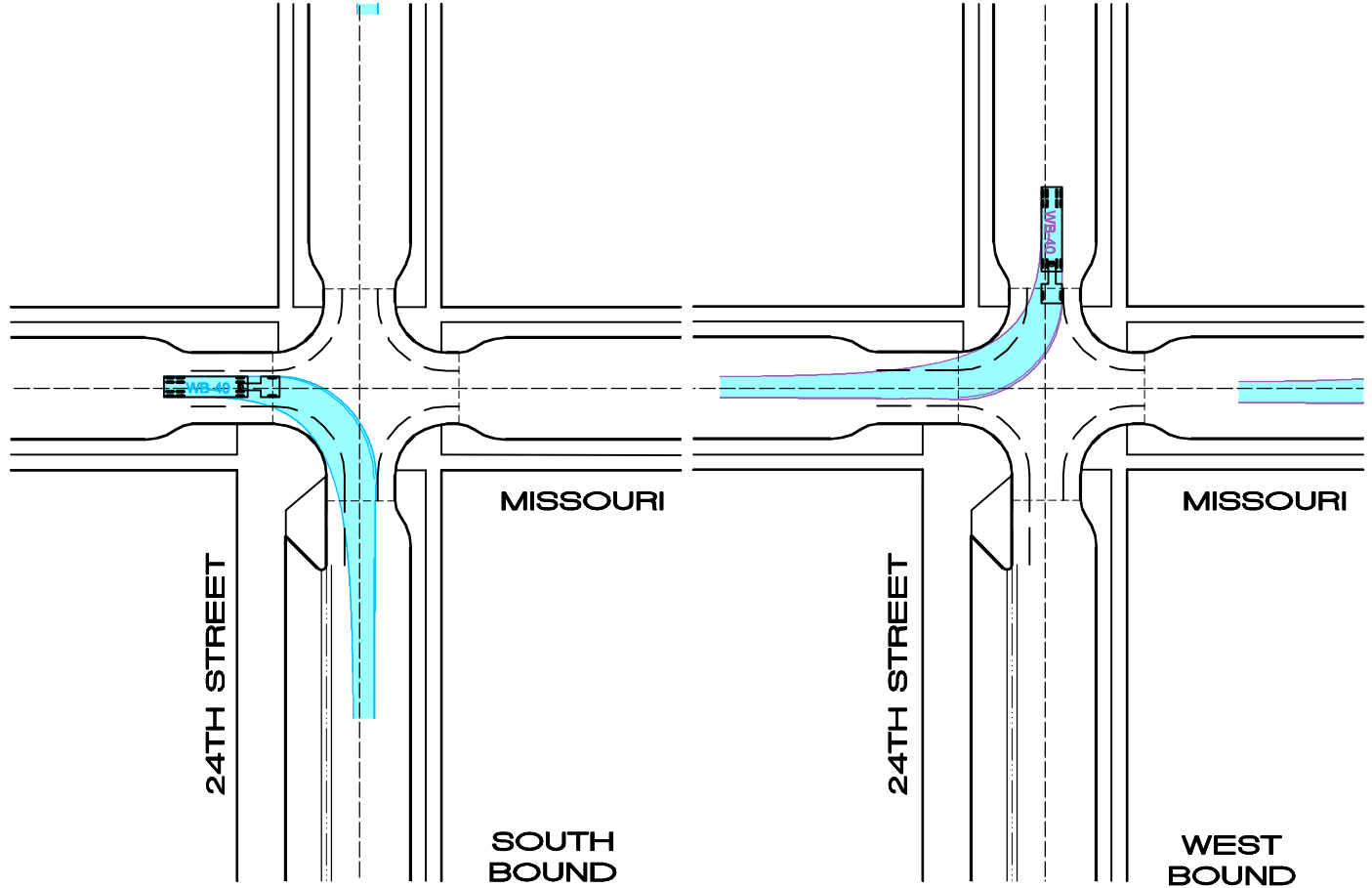
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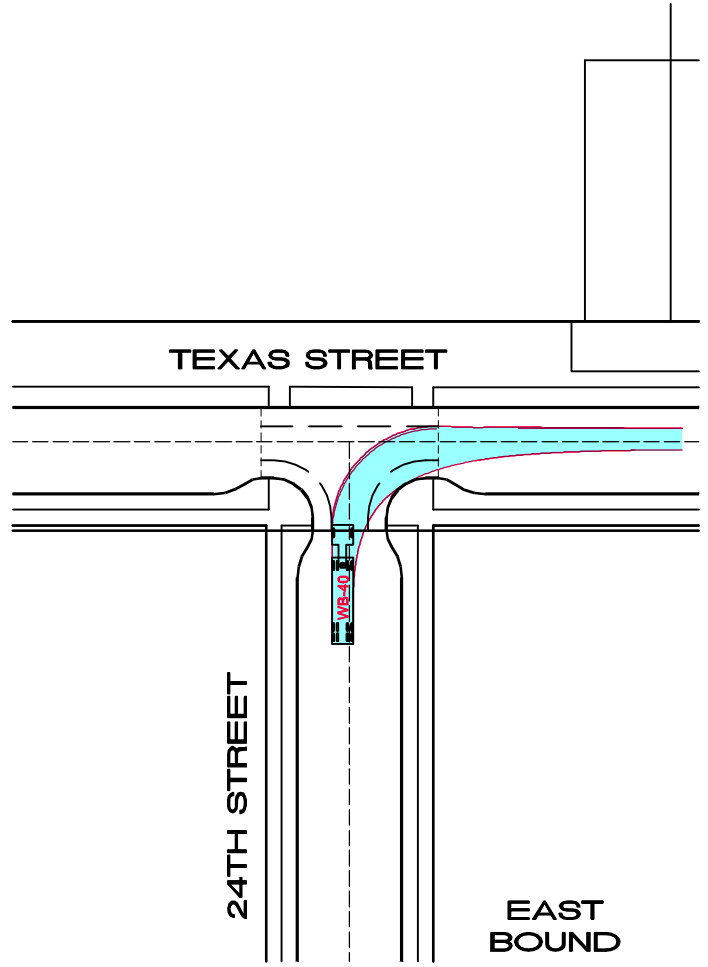
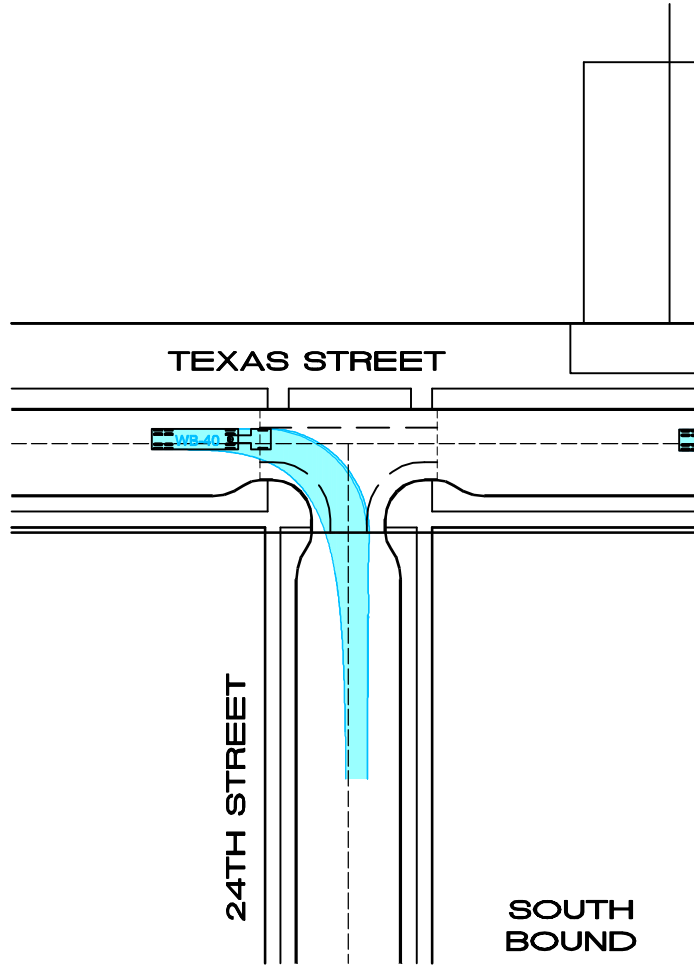


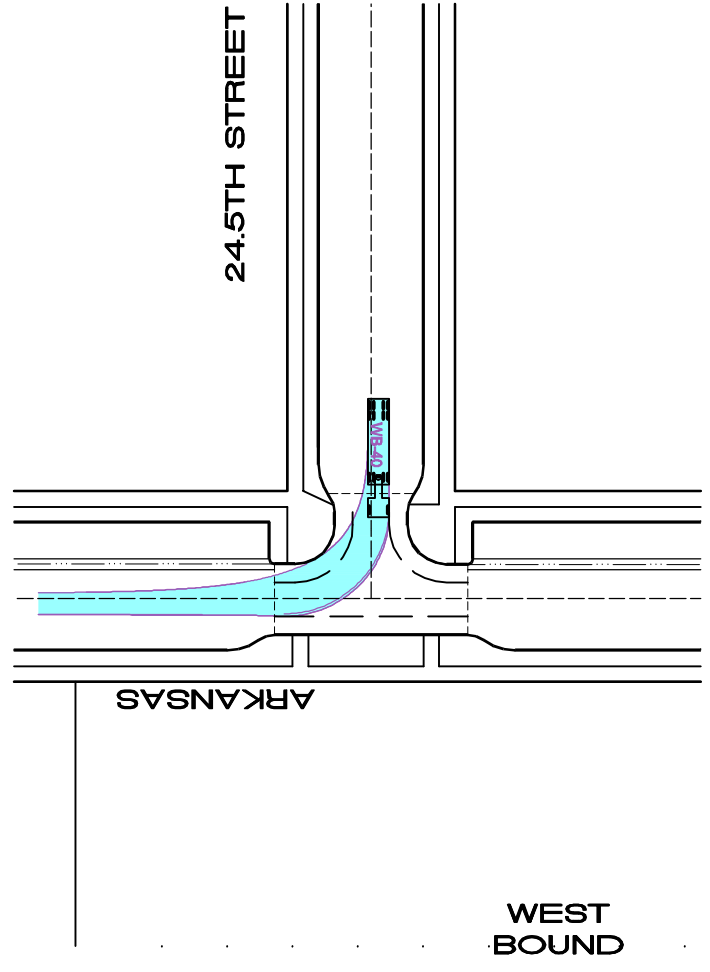
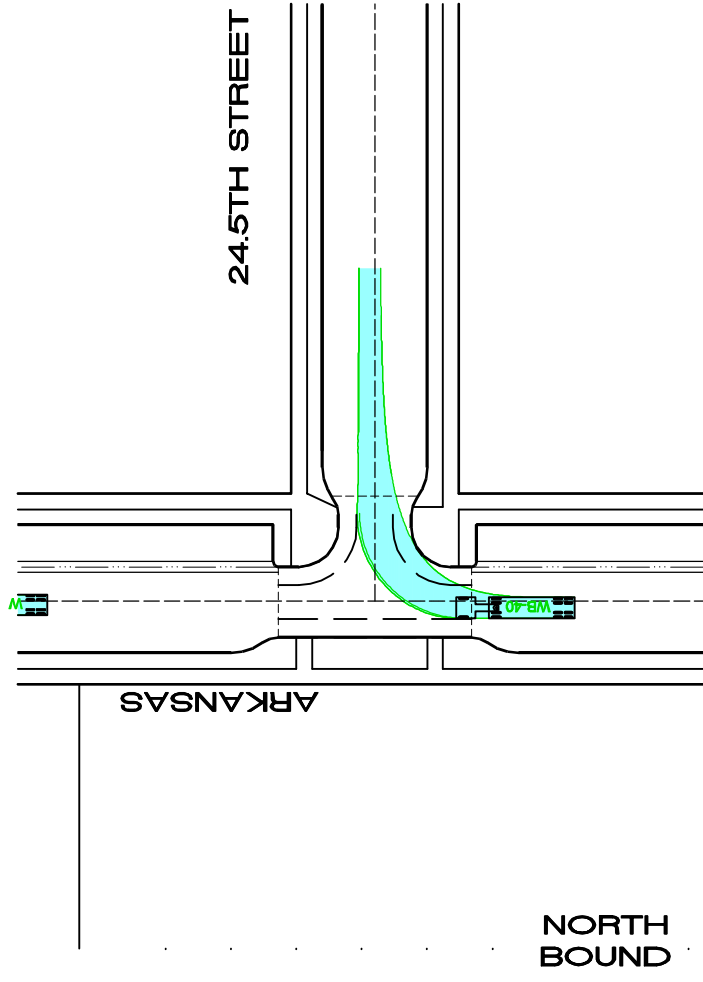


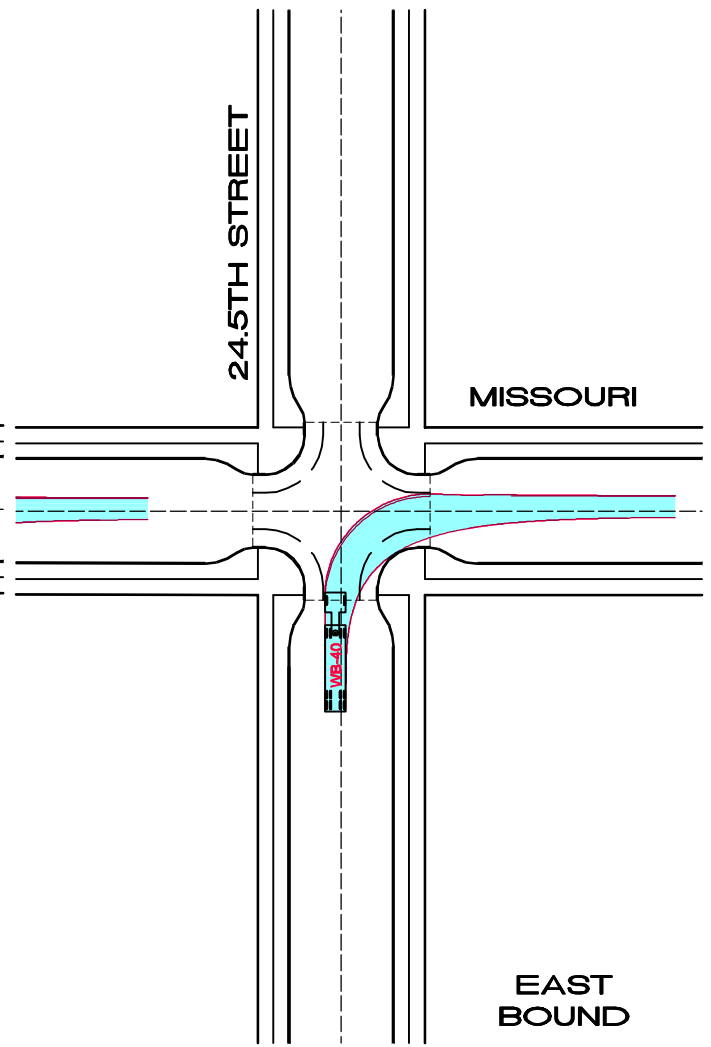
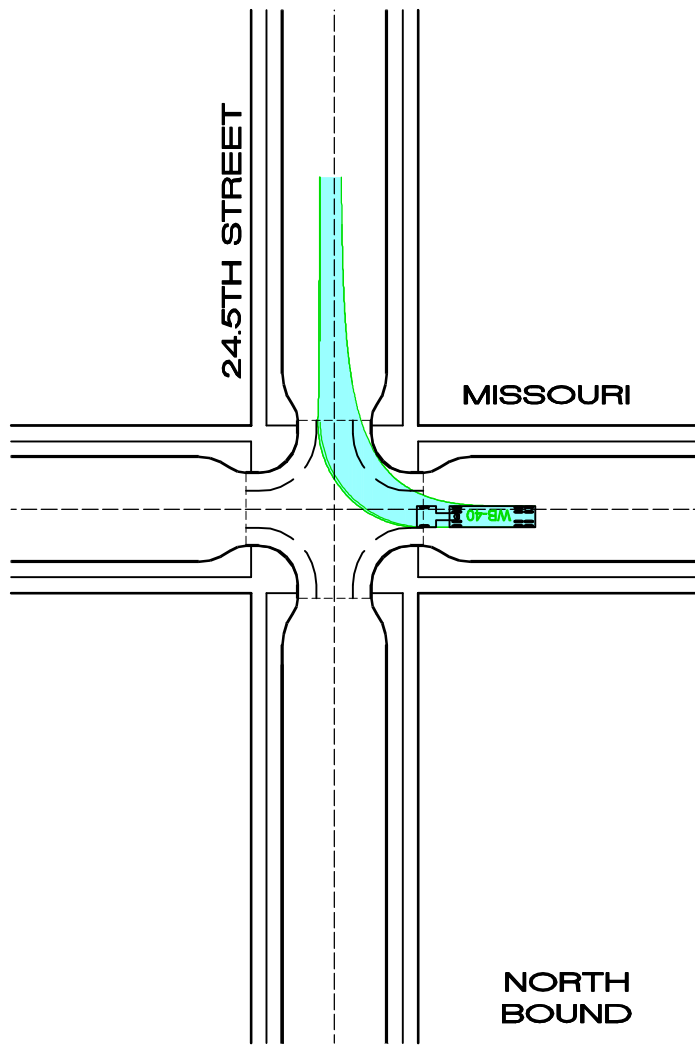
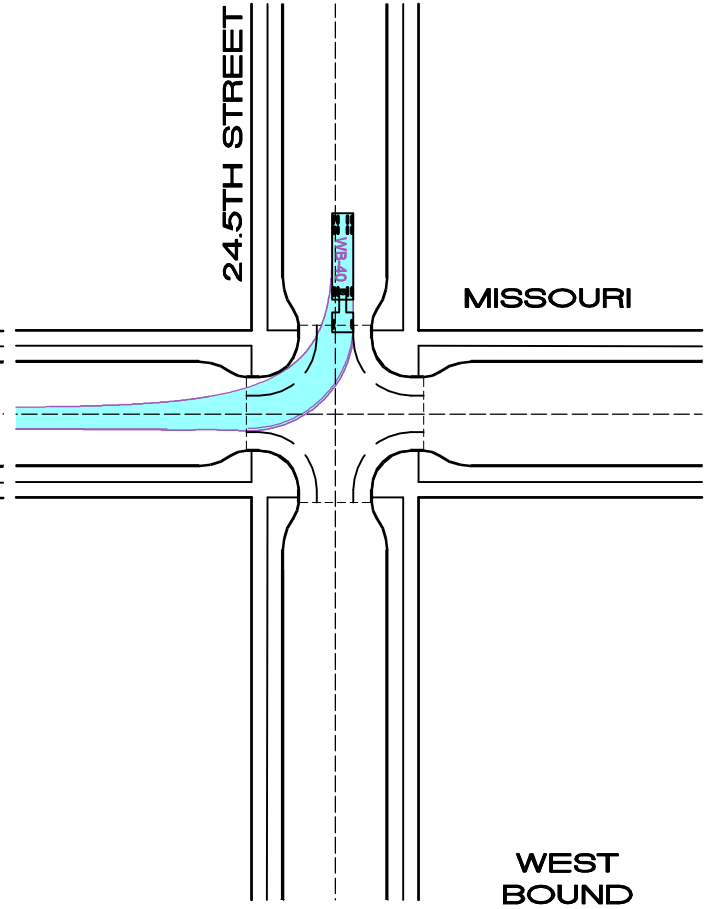
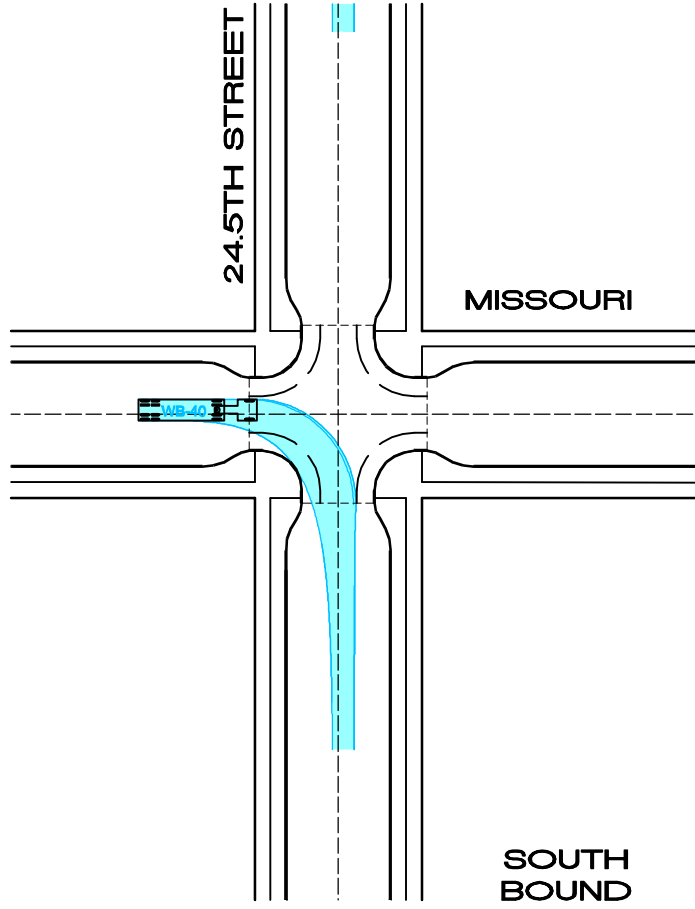


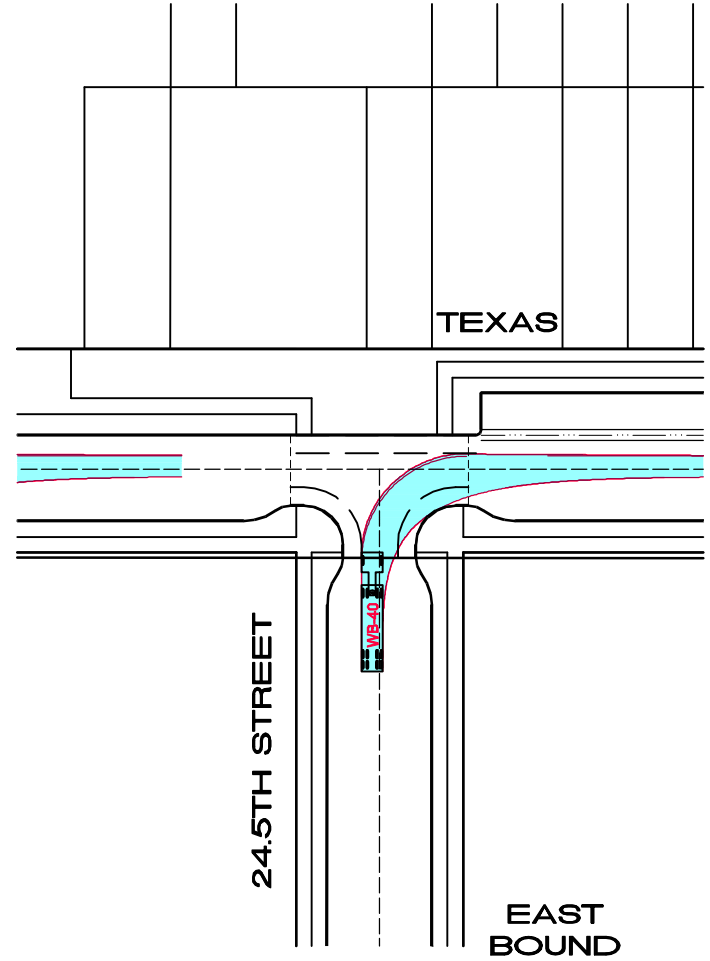
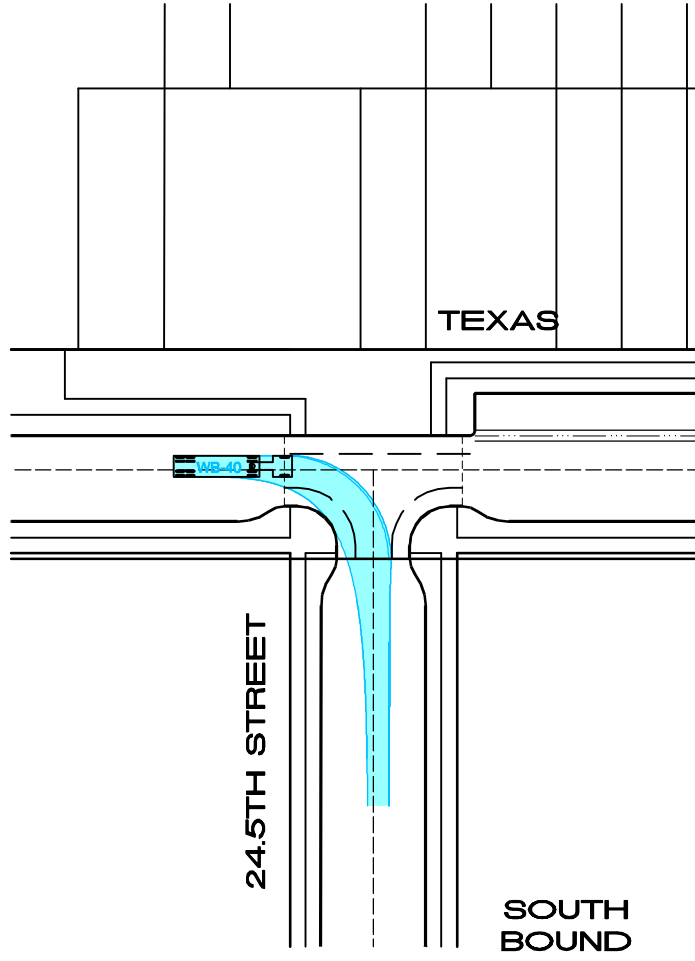


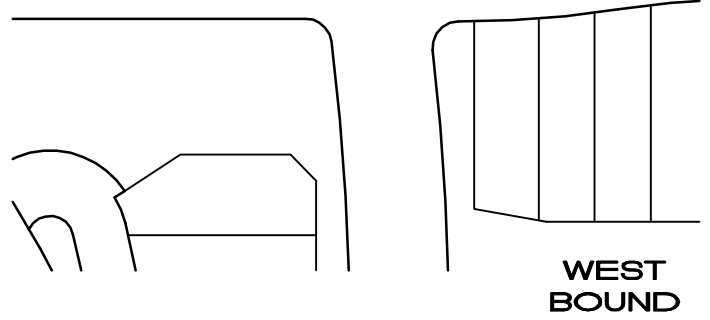
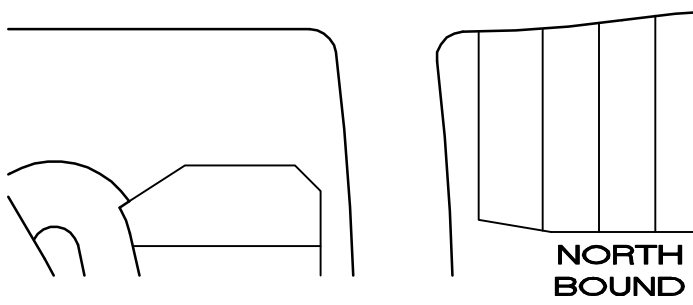
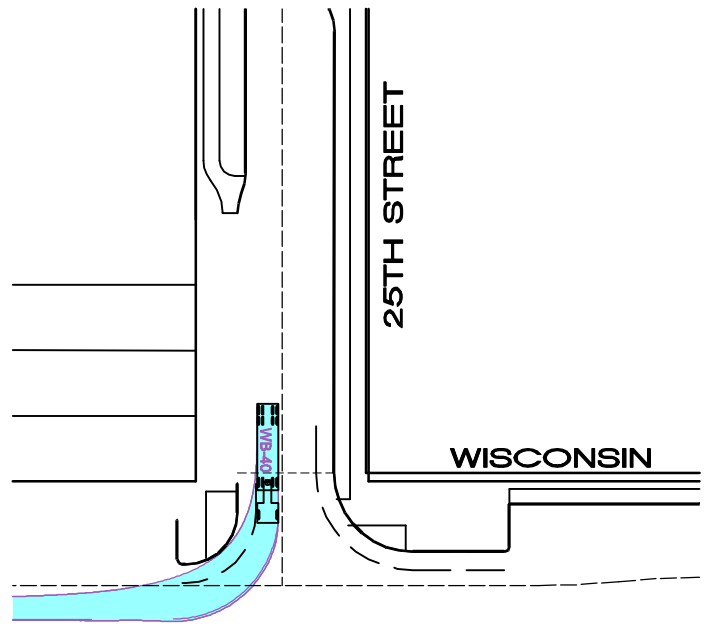
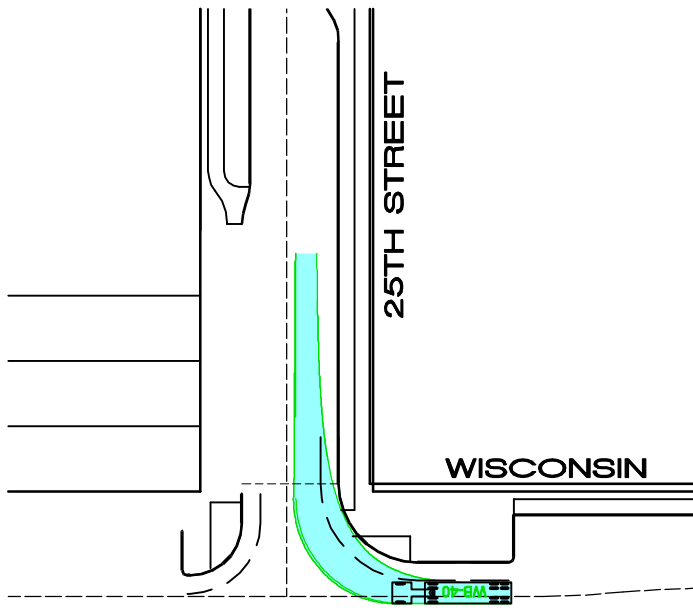


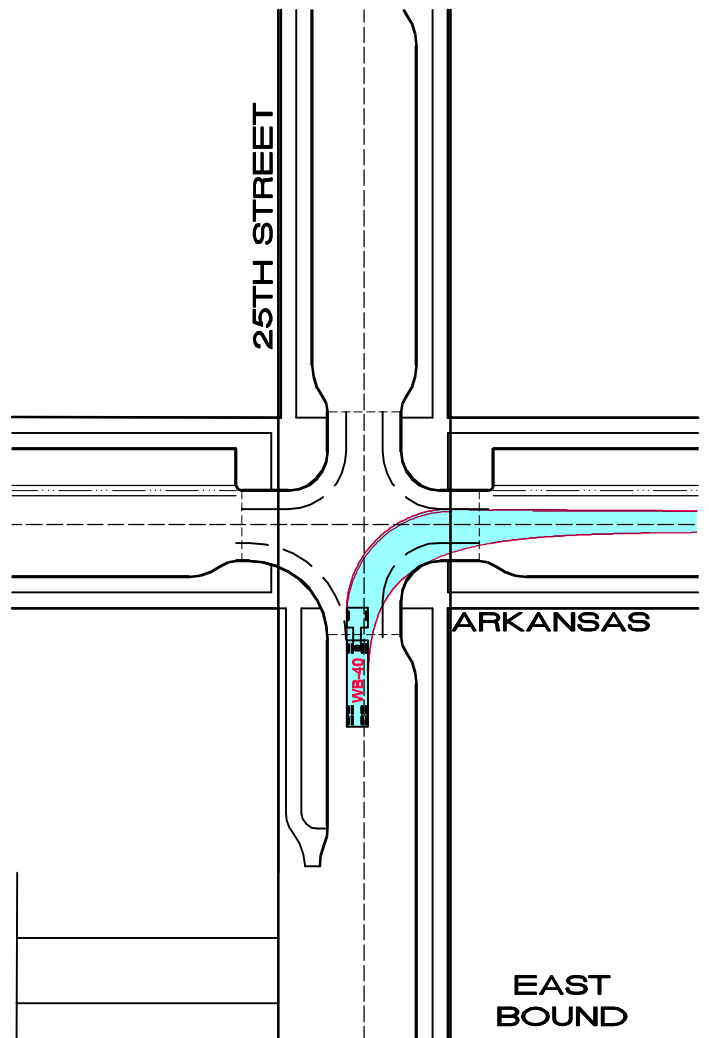
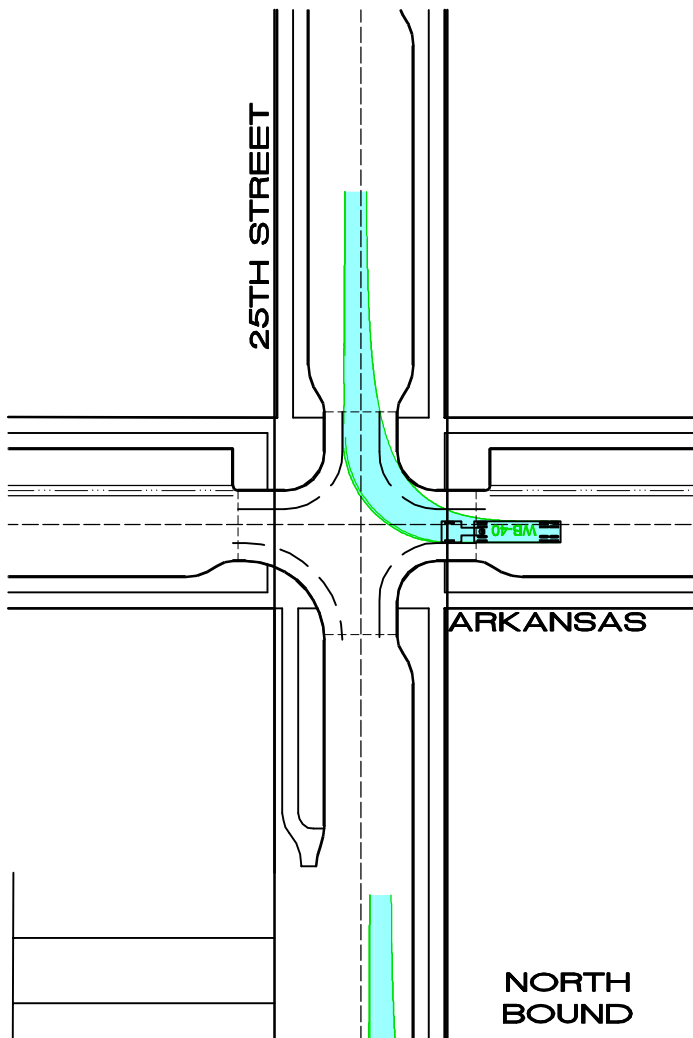
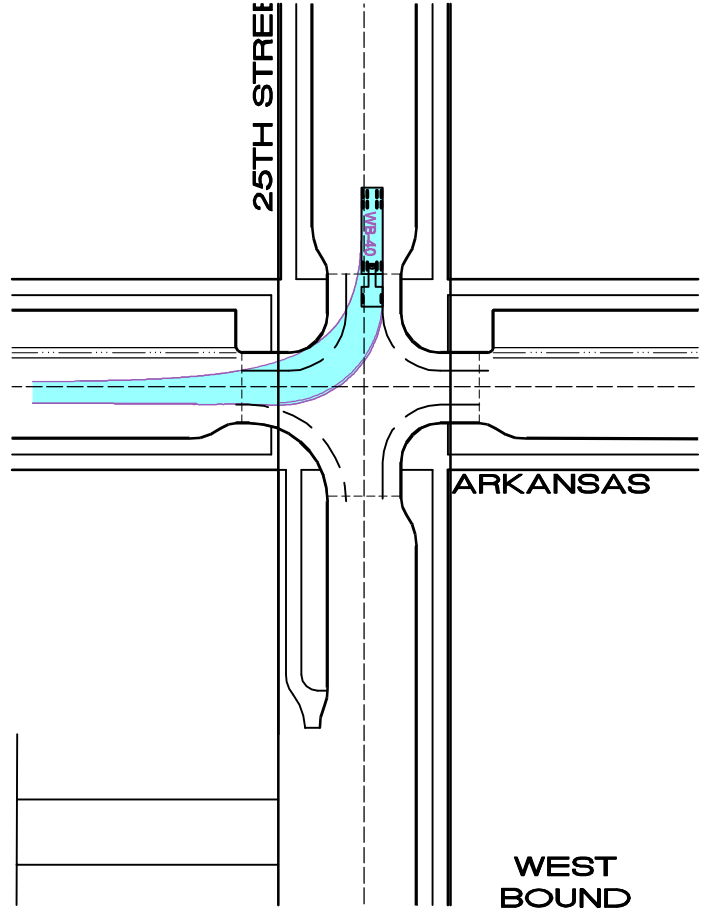
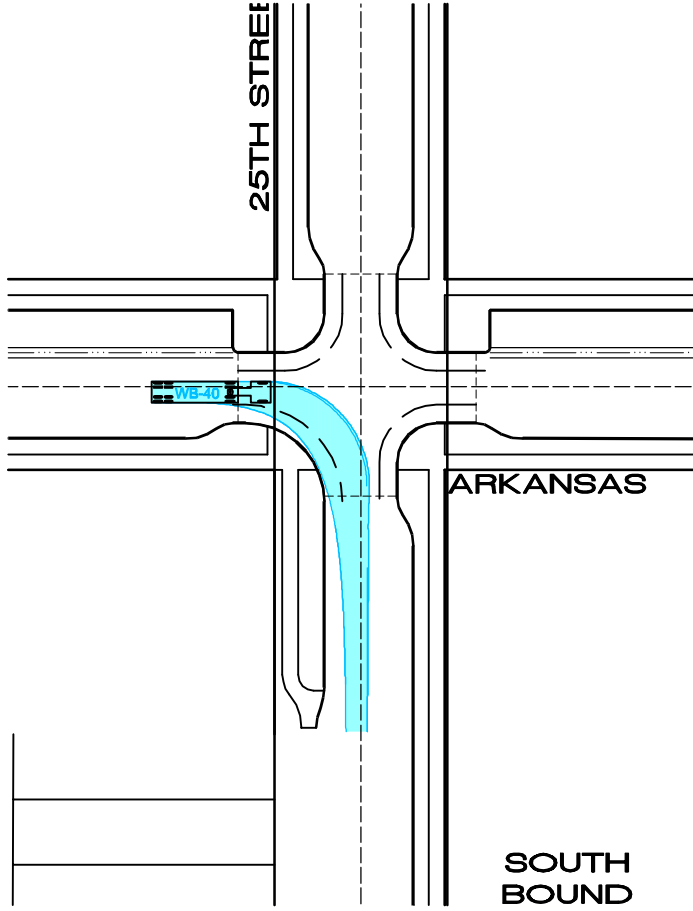


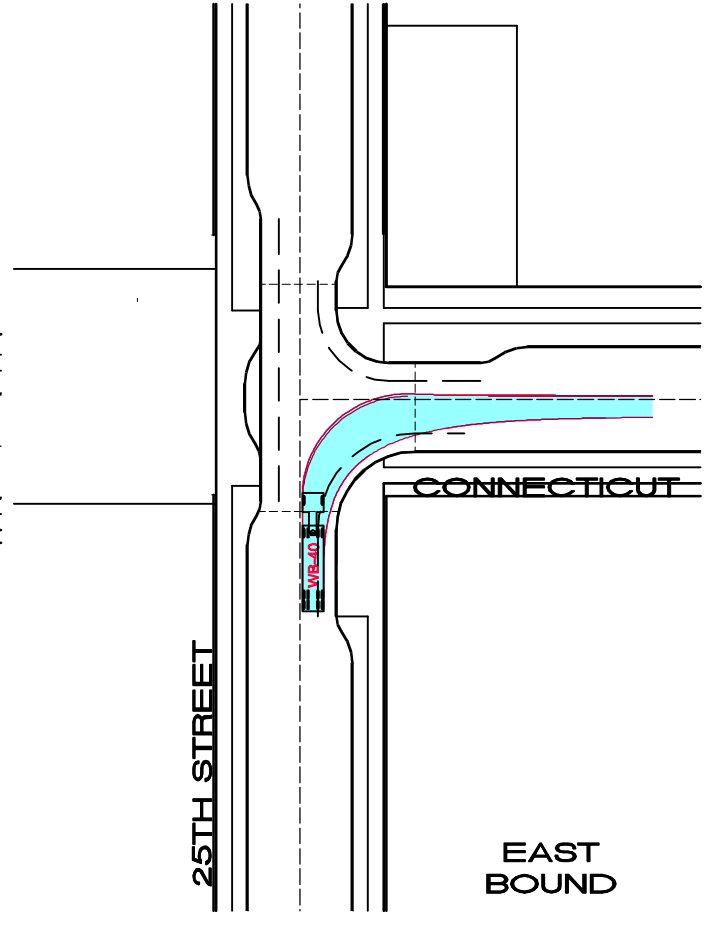
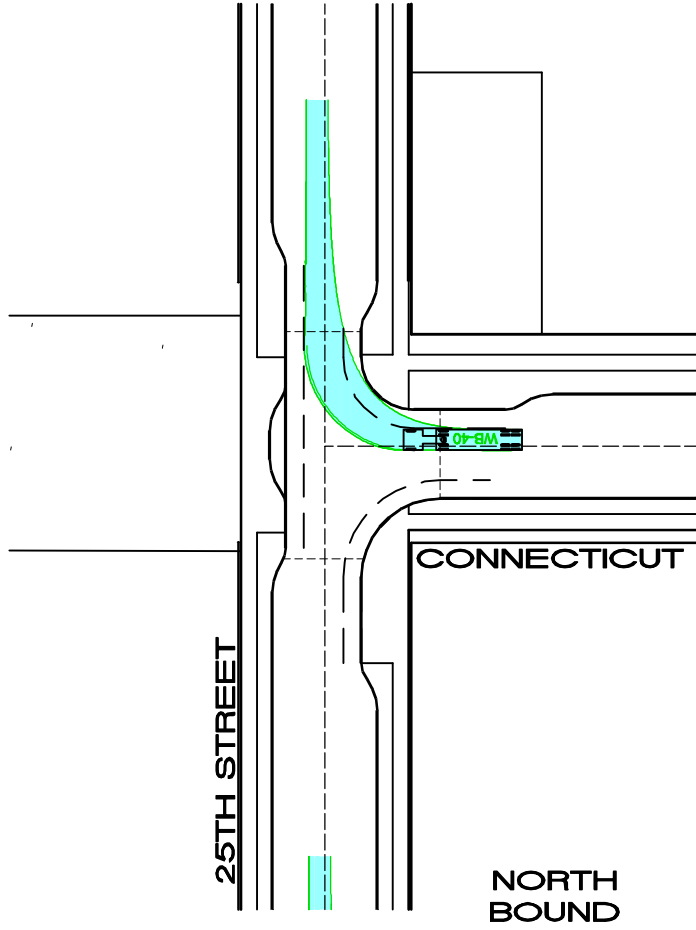


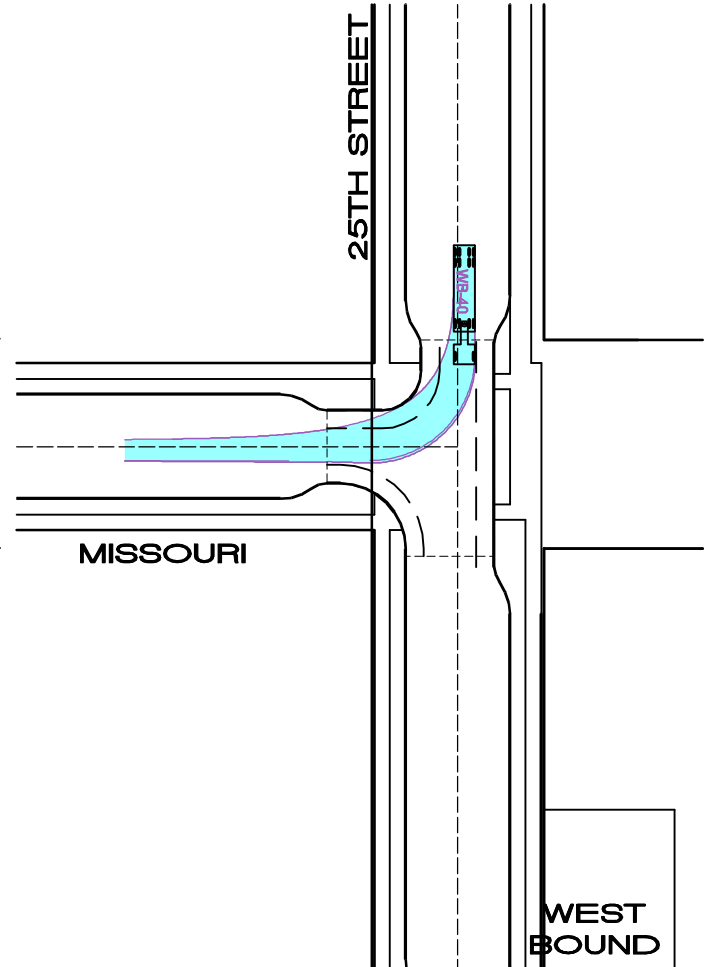
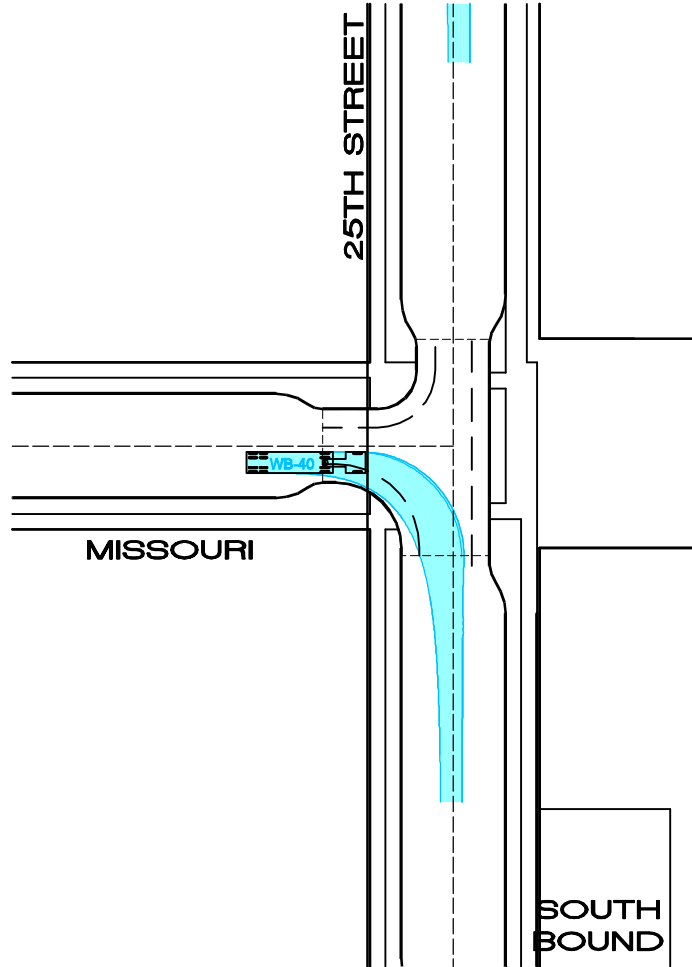


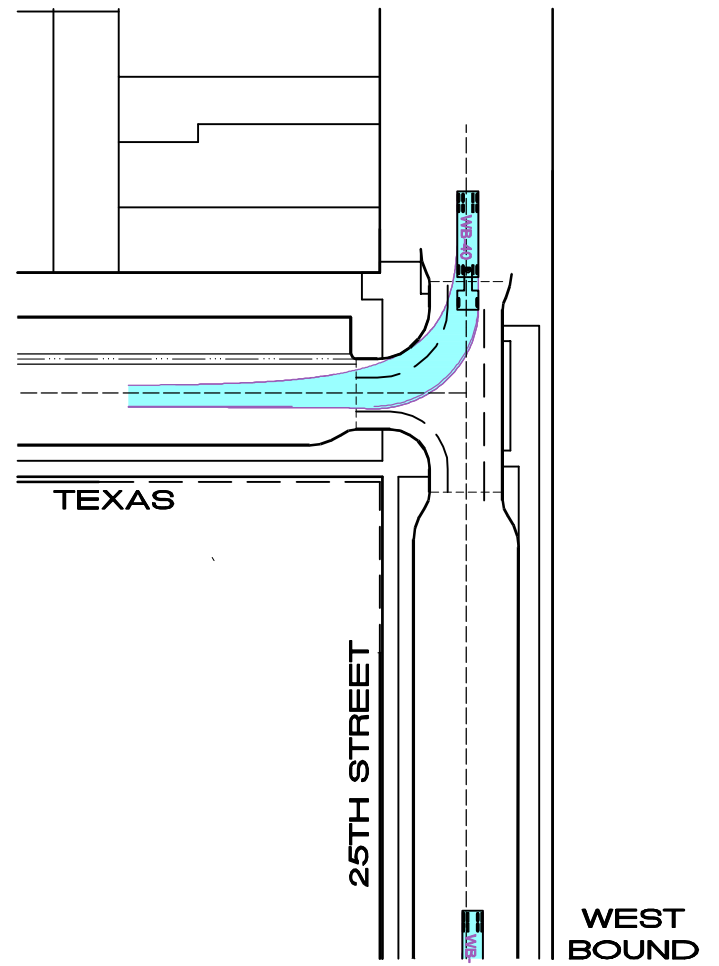
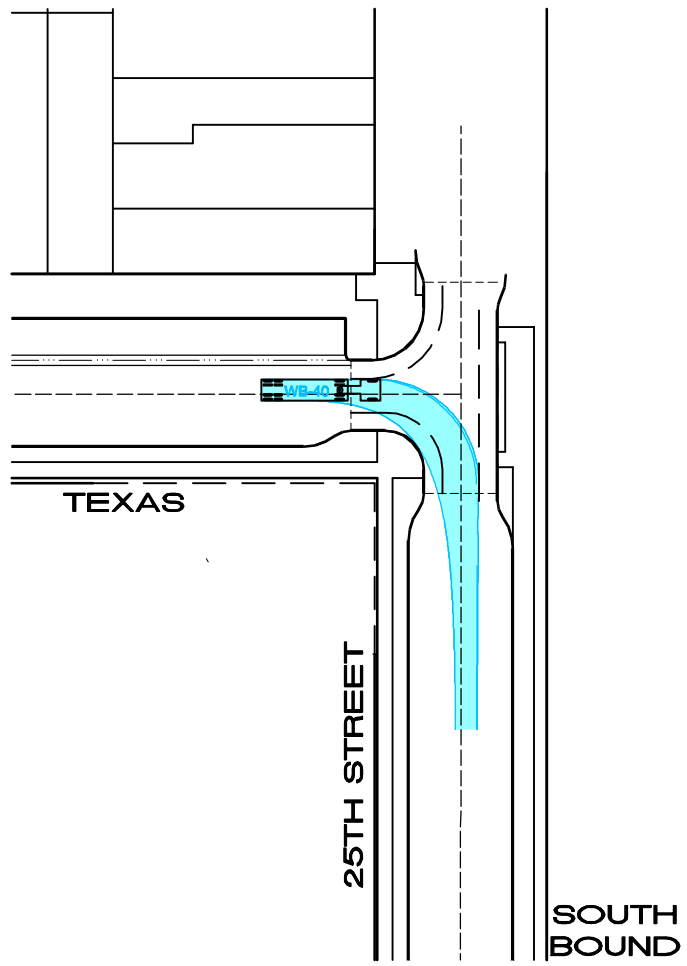


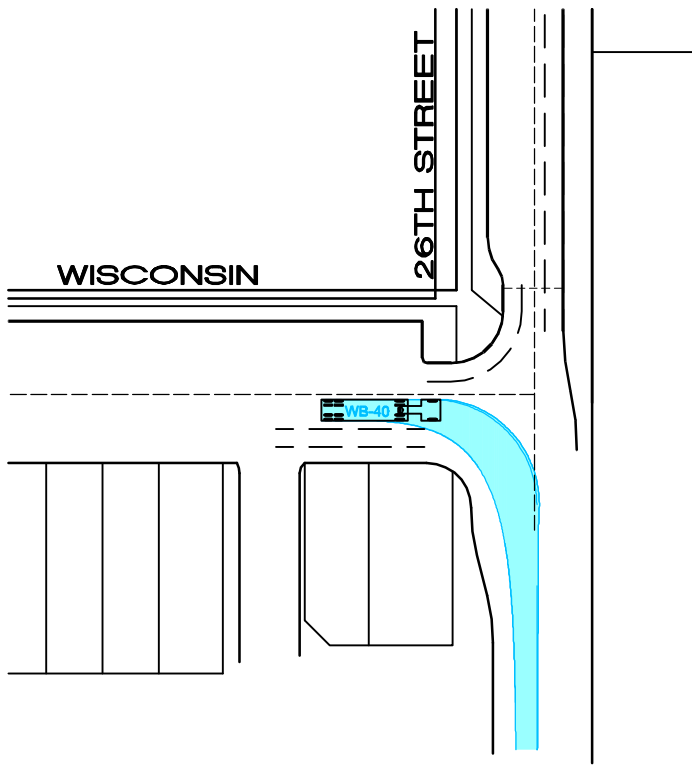




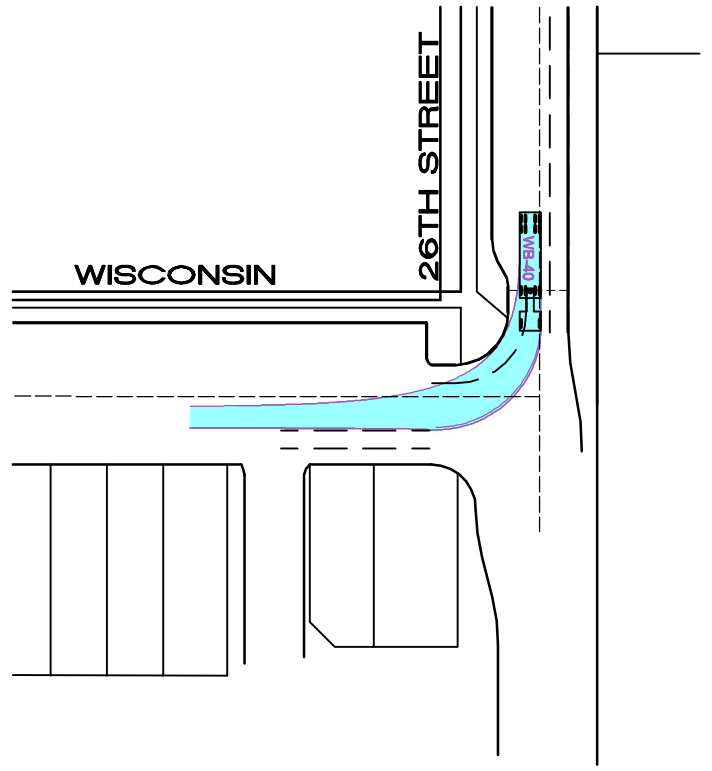




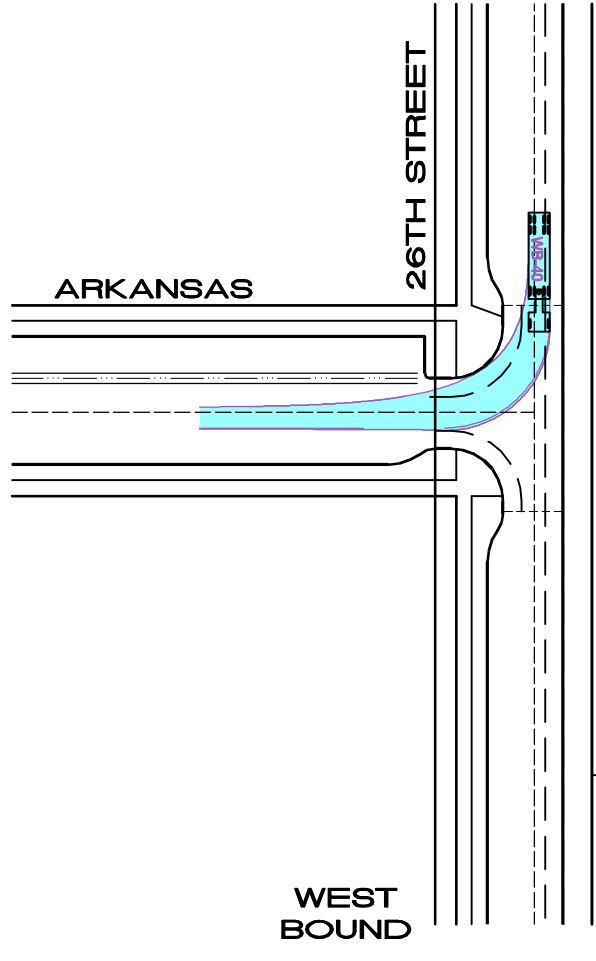
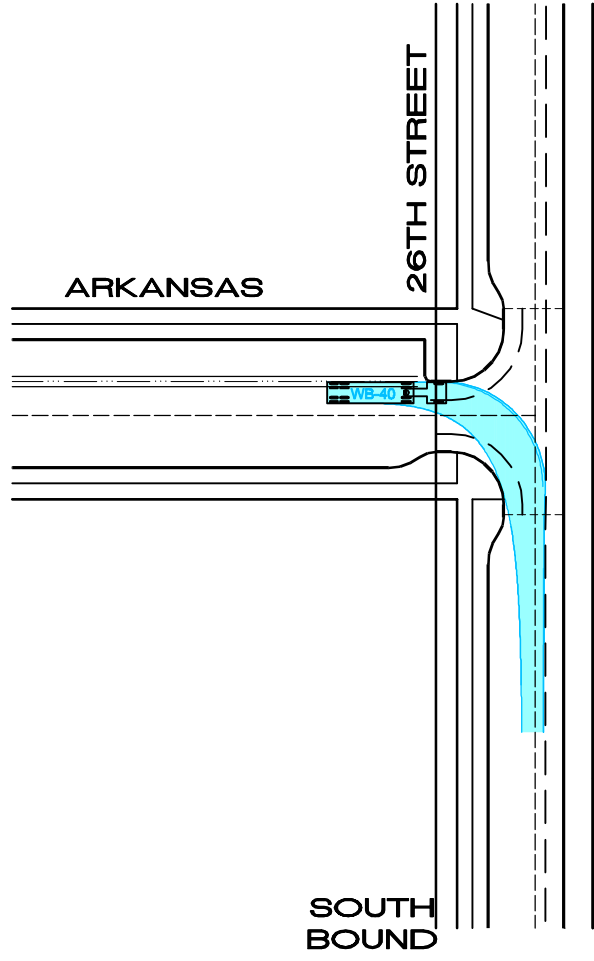


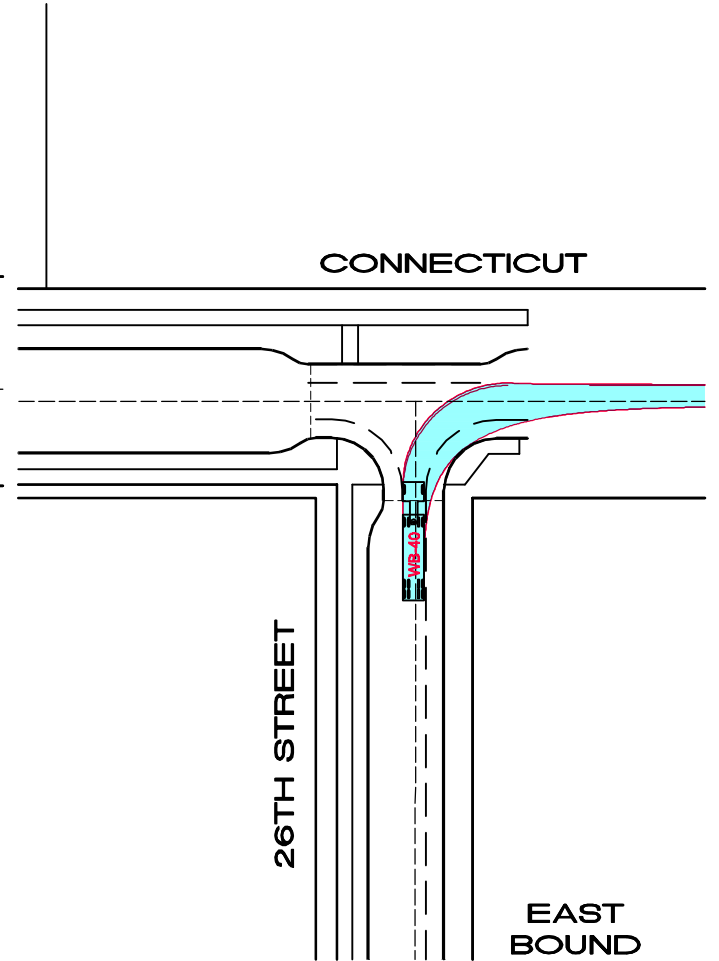
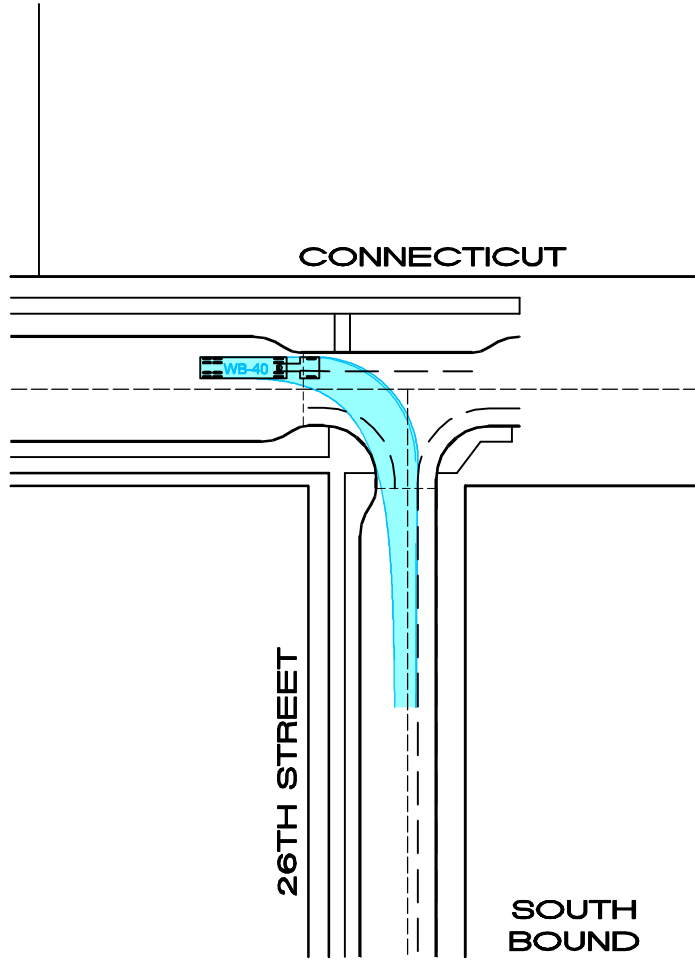


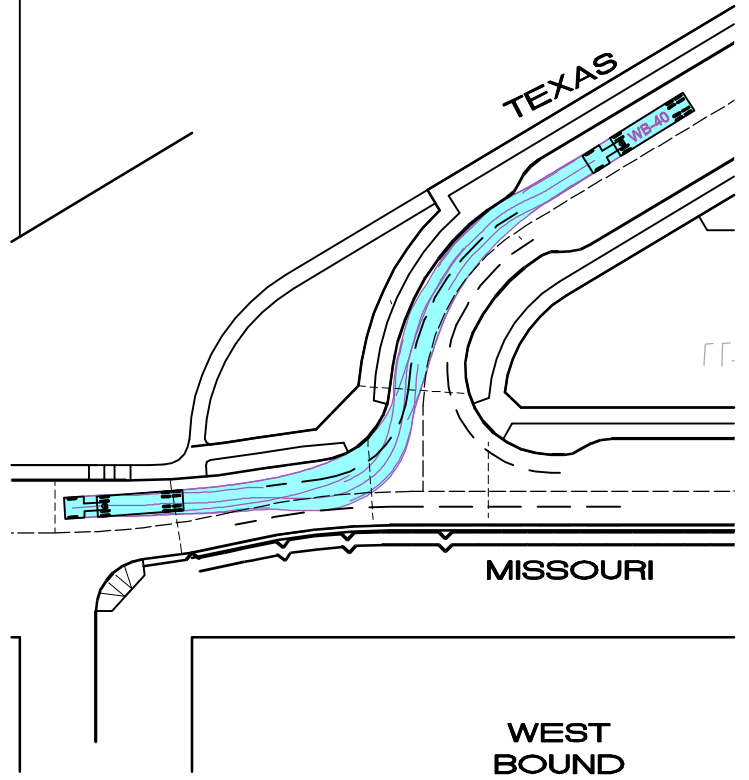
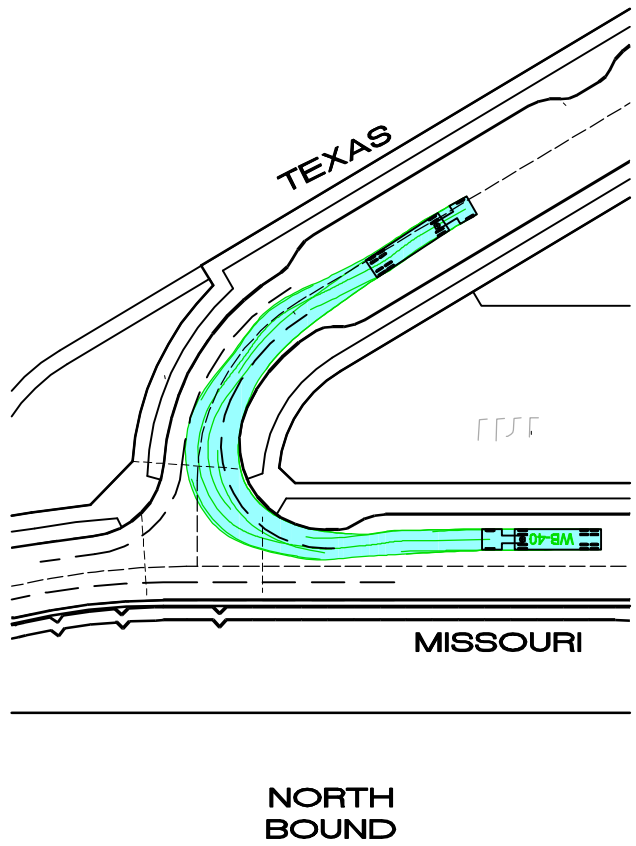
SOUTH
BOUND



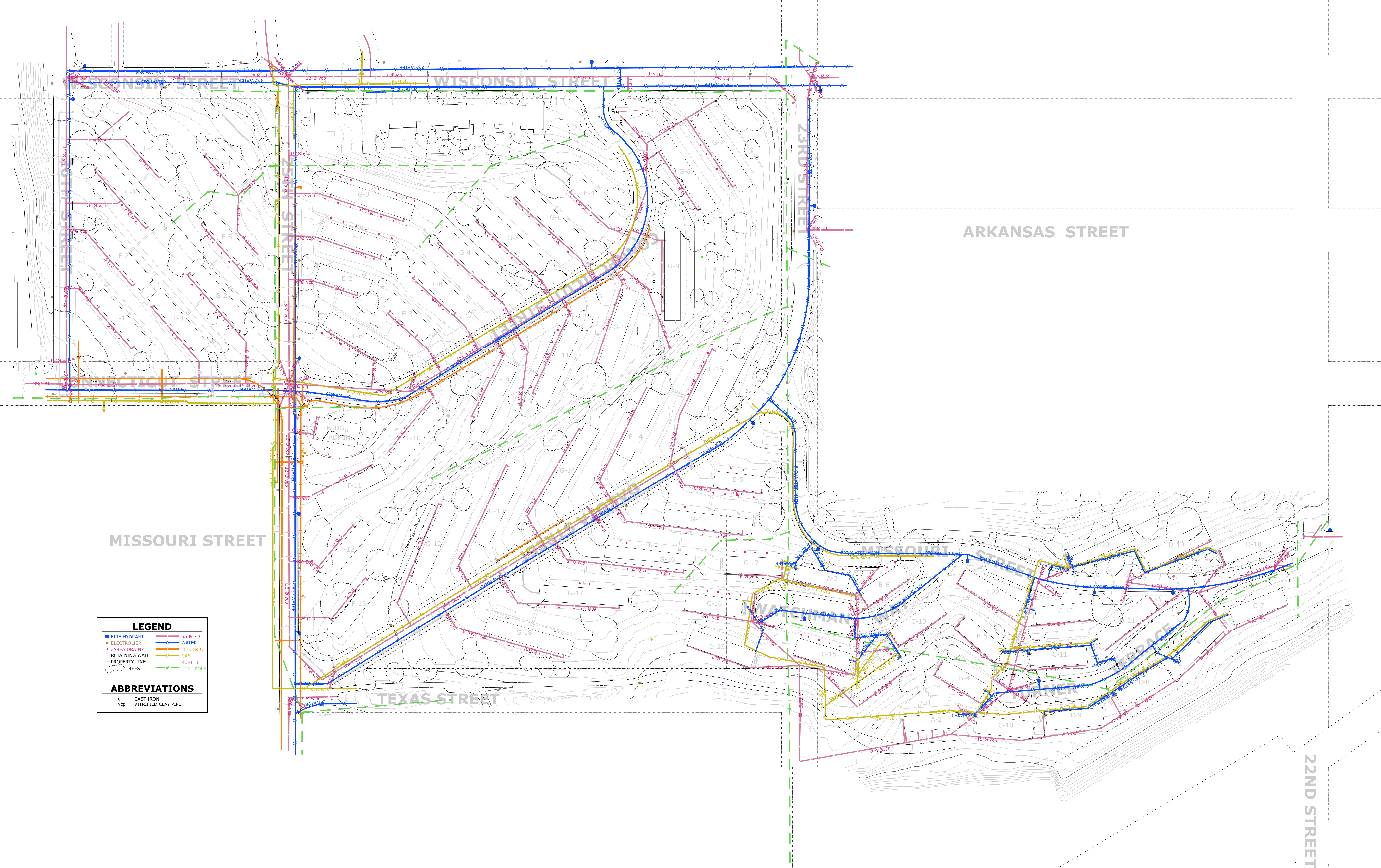
WEST
BOUND







Appendix B – Existing Utilities (Full Size)

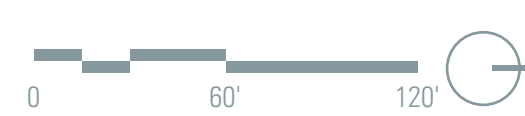


LEGEND

- FIRE HYDRANT
- ELECTROLIER
- AREA DRAIN
- ▬ RETAINING WALL
- ▬ PROPERTY LINE
- TREES
- ▬ SS & SD
- ▬ WATER
- ▬ ELECTRIC
- ▬ GAS
- ▬ RUNLET
- ▬ UTIL. POLE

ABBREVIATIONS

- ci CAST IRON
- vcp VITRIFIED CLAY PIPE



APPROXIMATE EXISTING CONDITIONS TO BE
 VERIFIED THROUGH FULL UTILITY SURVEY

Appendix C – Vertical Clearance Diagrams

30' VERTICAL CURVE CHECK

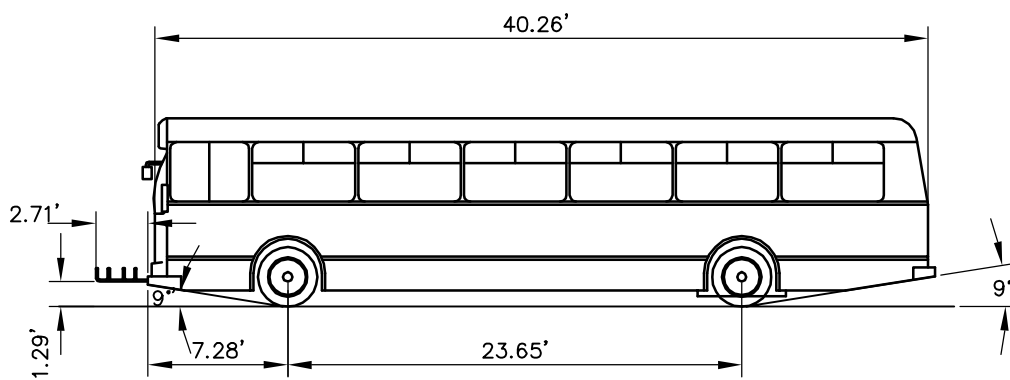
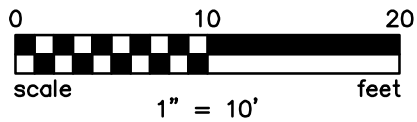
EXCELSIOR
NEW FLYER

POTRERO

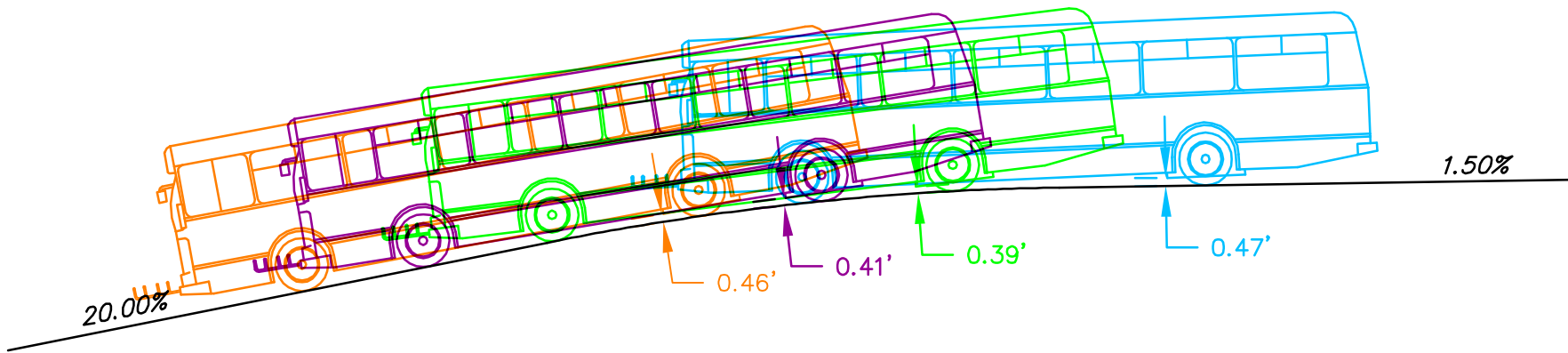
SAN FRANCISCO, CALIFORNIA

JUNE 2016

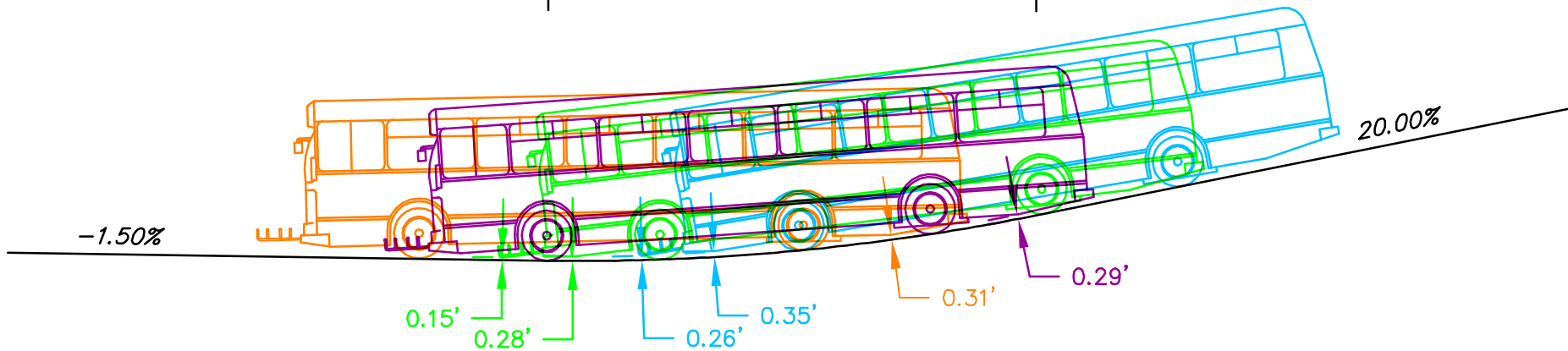
PROJECT No. 2009013.00



30.00' VERT CURVE



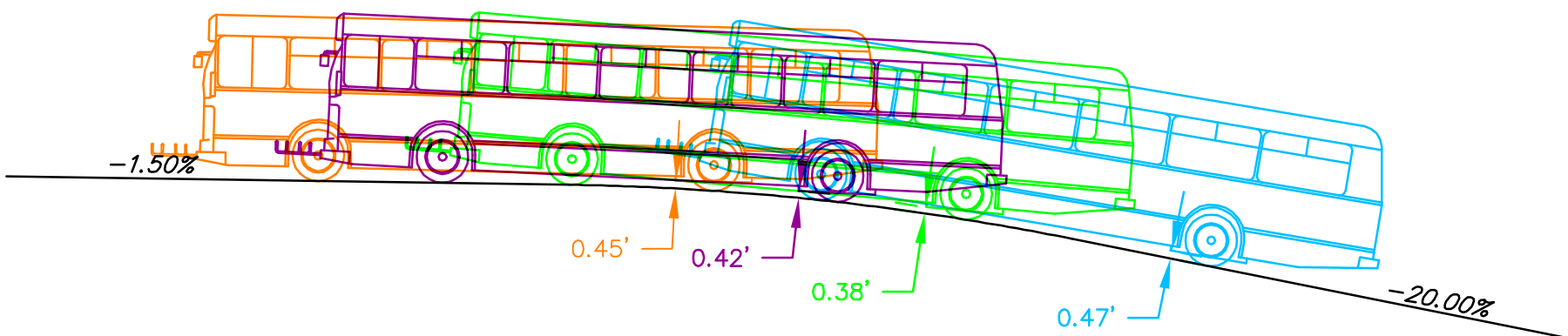
30.00' VERT CURVE



30.00' VERT CURVE

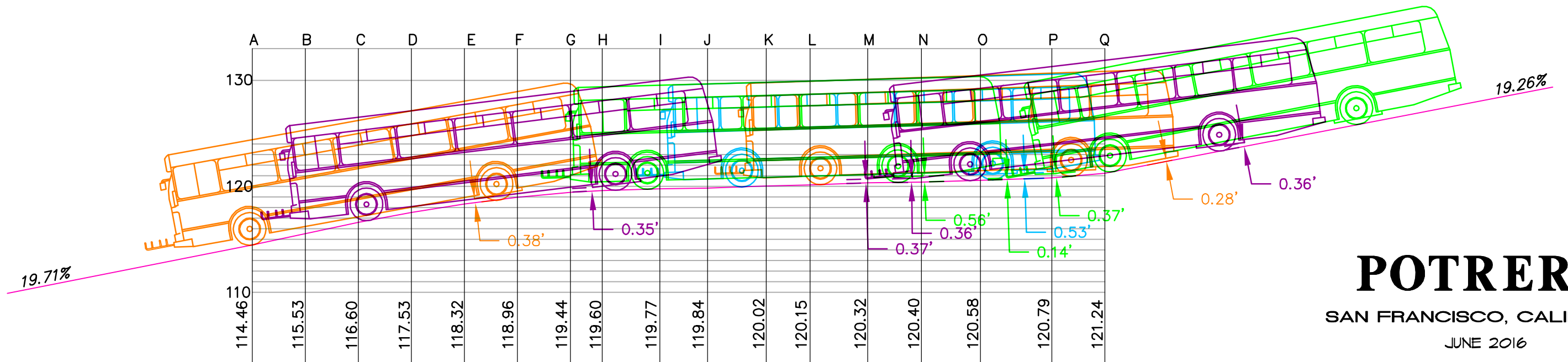
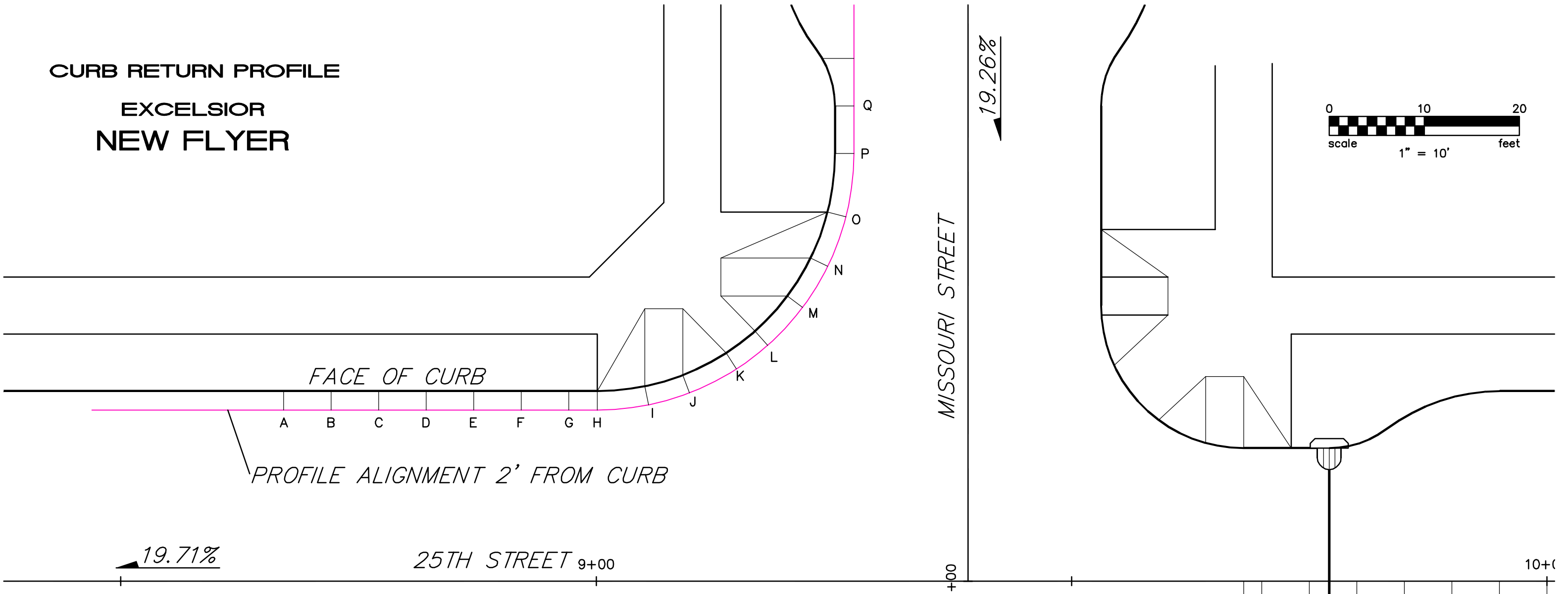


30.00' VERT CURVE



CURB RETURN PROFILE

**EXCELSIOR
NEW FLYER**



POTRERO

SAN FRANCISCO, CALIFORNIA

JUNE 2016

PROJECT No. 2009013.00

30' VERTICAL CURVE CHECK

SFFD - AERIAL TRUCK

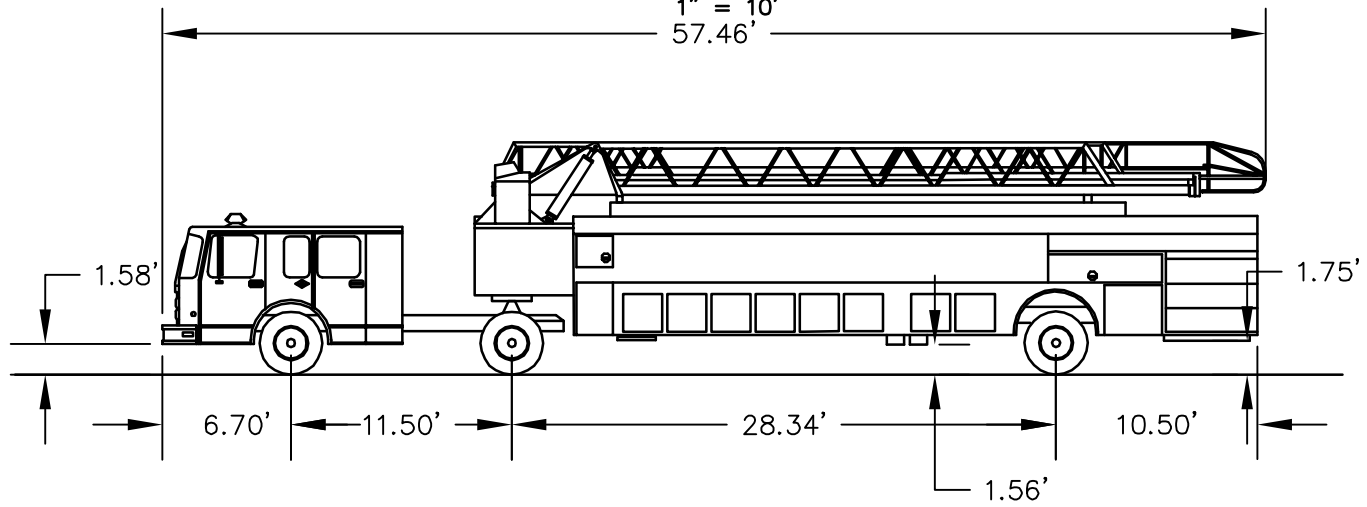
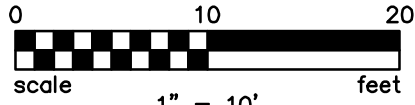
POTRERO

SAN FRANCISCO, CALIFORNIA

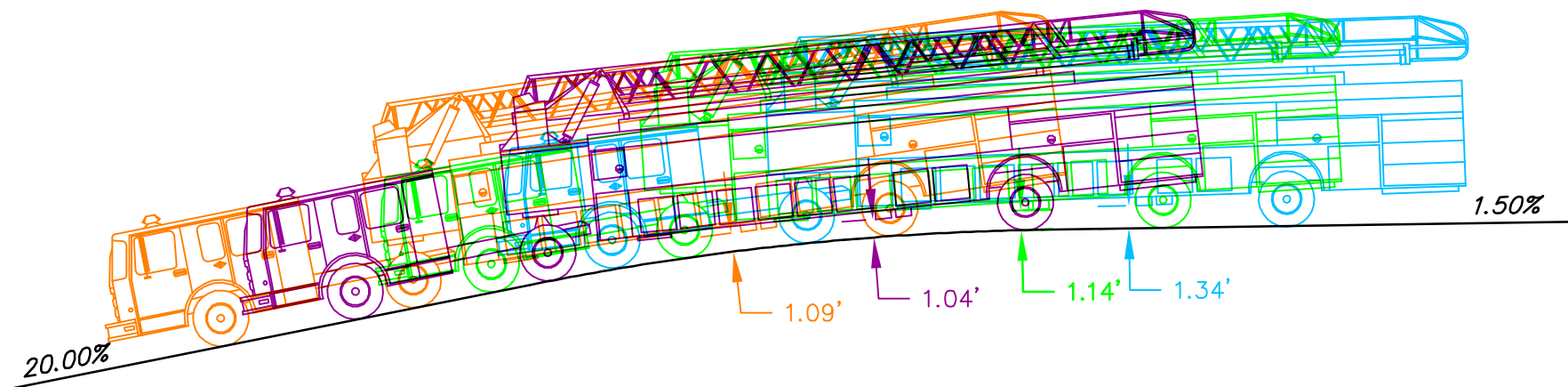
APRIL 2016

PROJECT No. 2009013.00

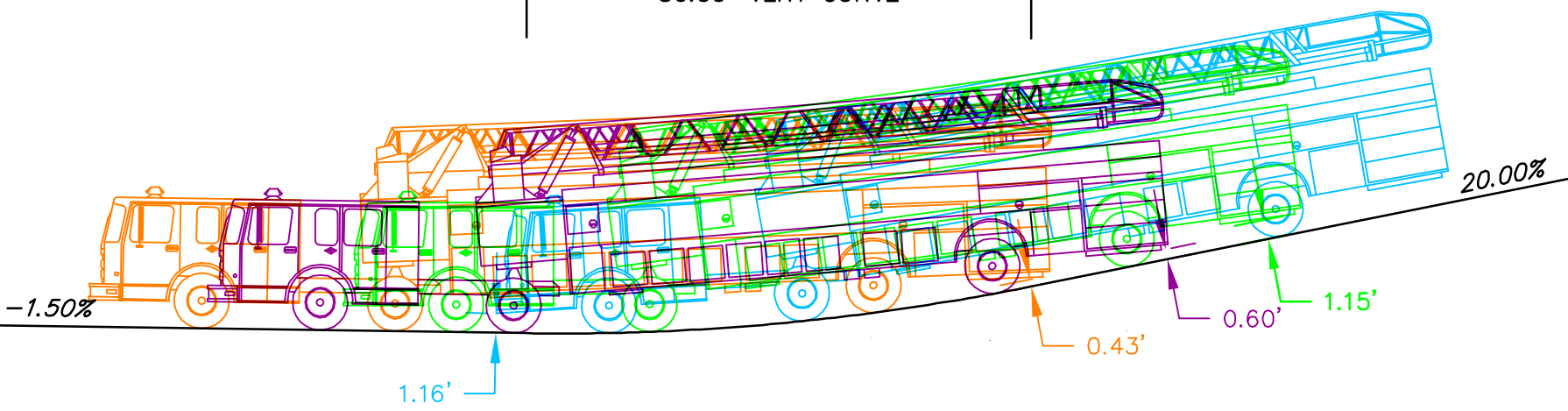
HUNTERS VIEW



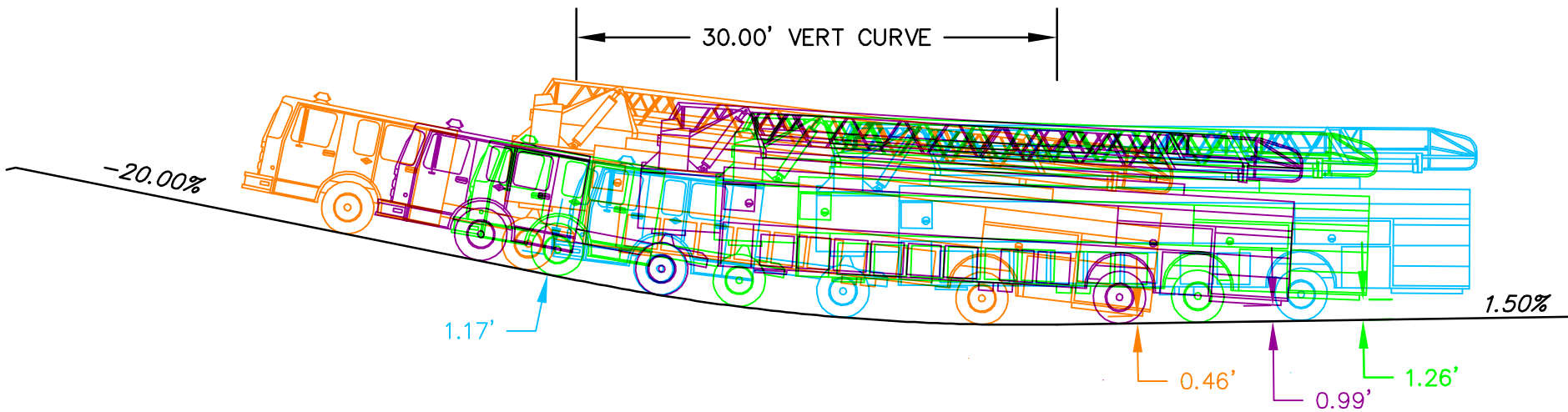
30.00' VERT CURVE



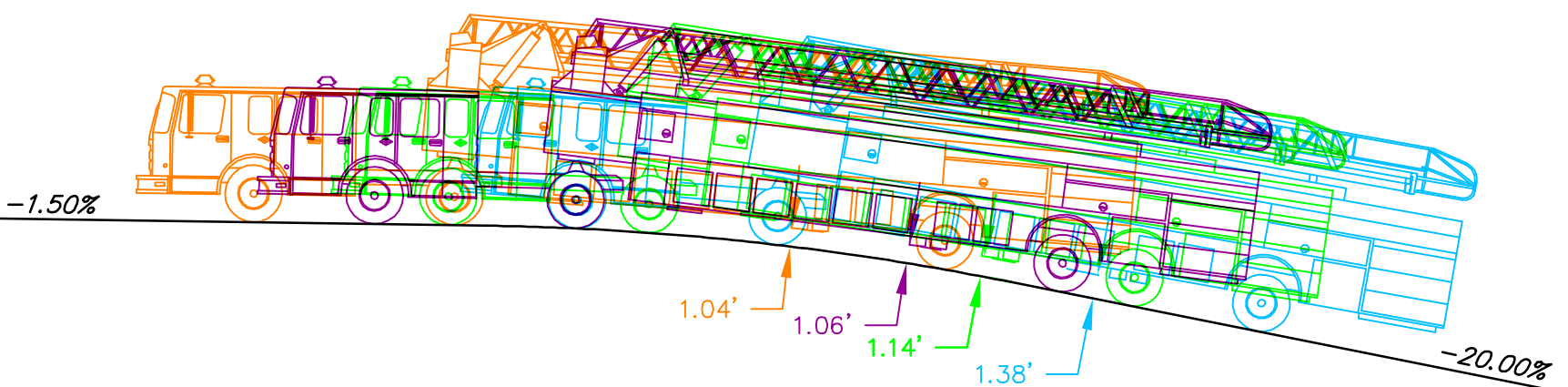
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



30' VERTICAL CURVE CHECK

SFFD - AERIAL TRUCK

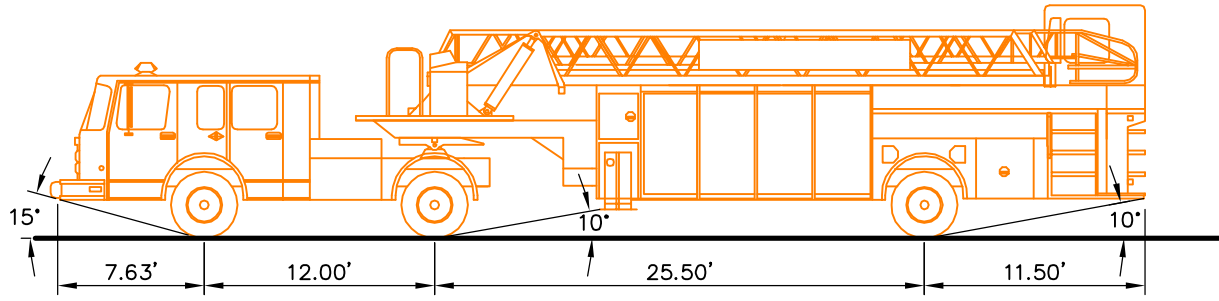
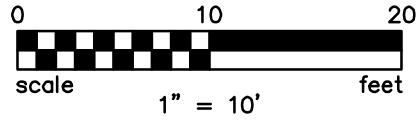
MTA MODEL

POTRERO

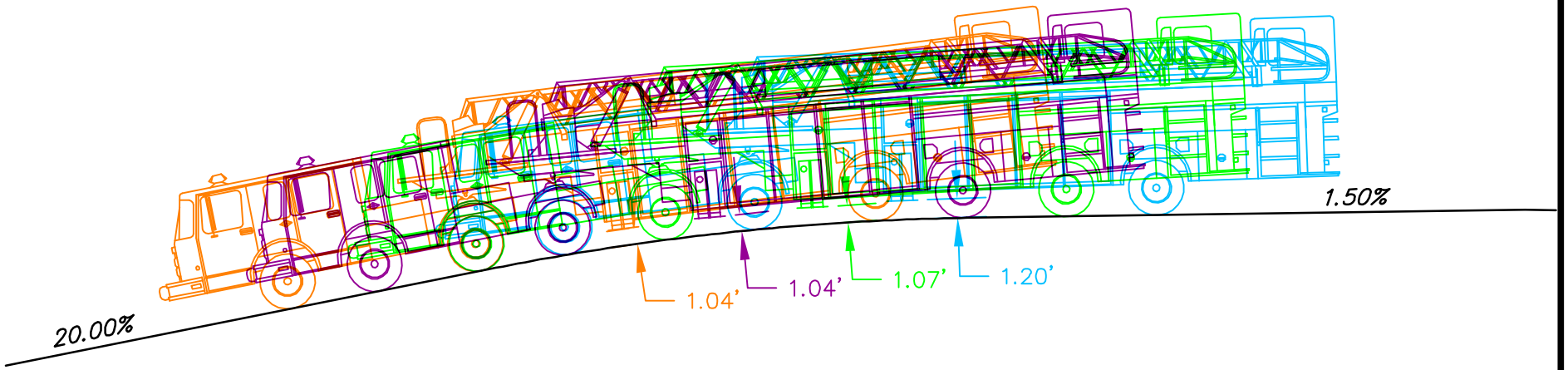
SAN FRANCISCO, CALIFORNIA

APRIL 2016

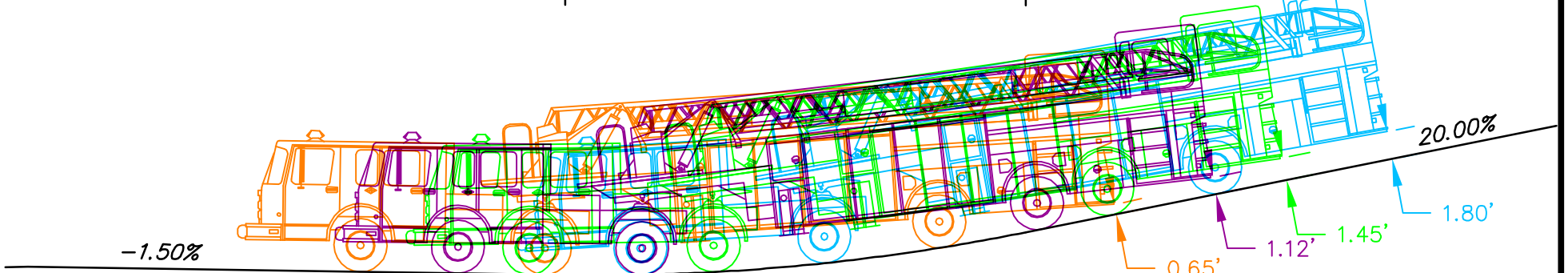
PROJECT No. 2009013.00



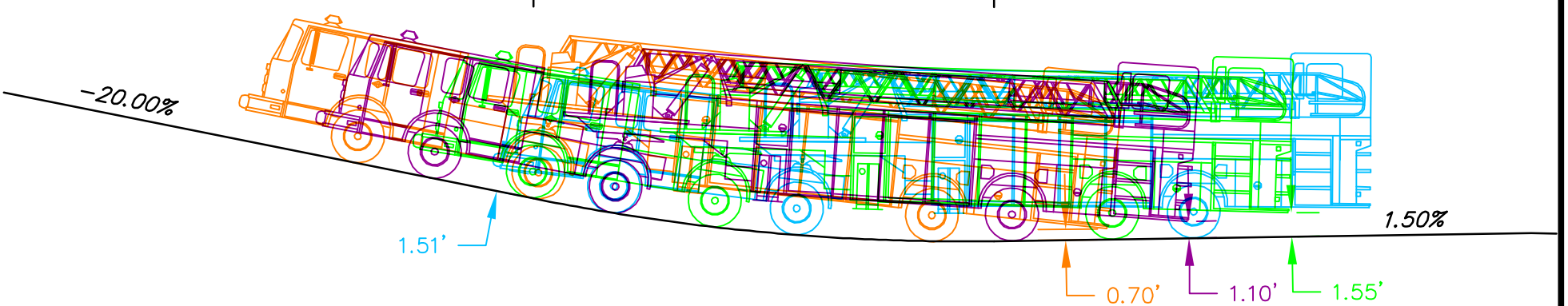
30.00' VERT CURVE



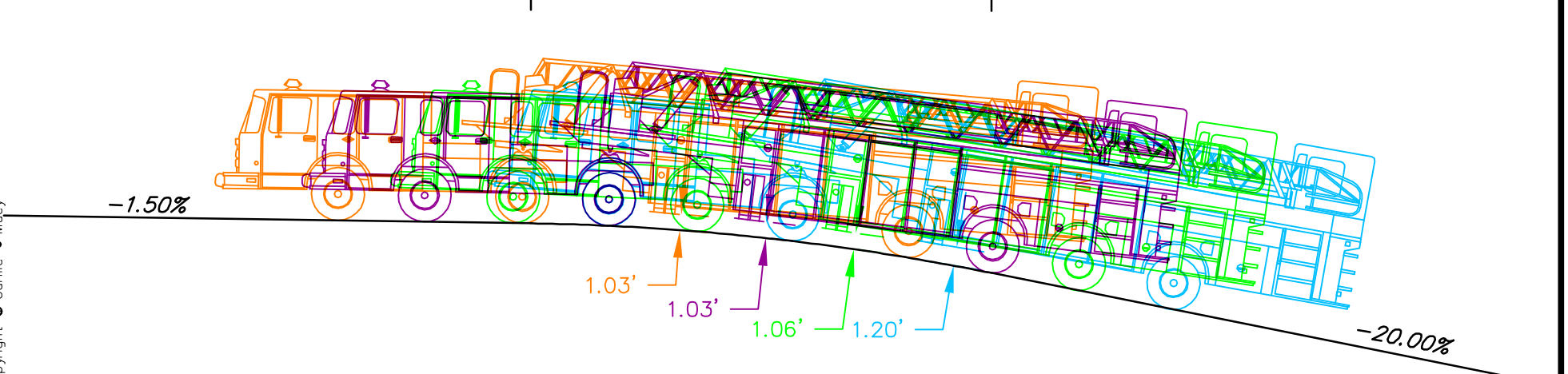
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



[AutoCAD file name: 09013-EXH-201t_vert_curve.dwg] [Xref files: 09013-BA1] Copyright © Carrille • Macey

30' VERTICAL CURVE CHECK

SFFD - AERIAL TRUCK

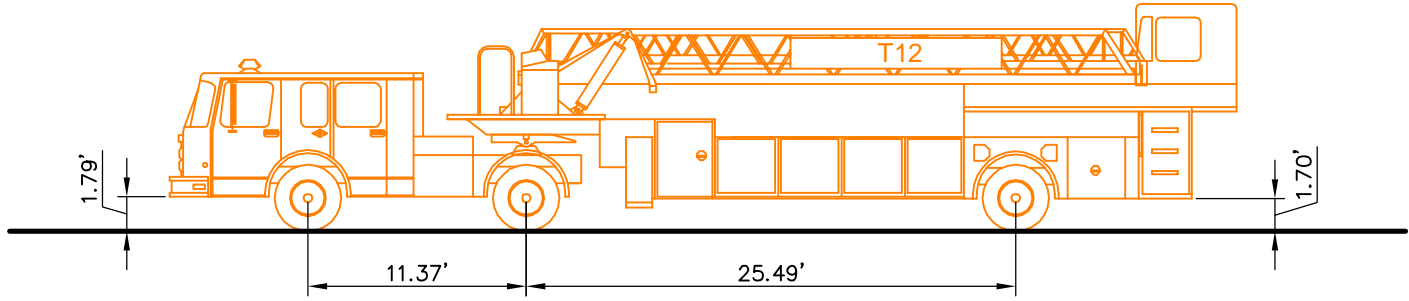
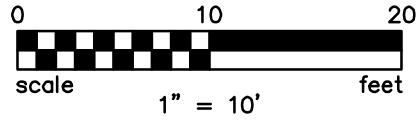
ENGINE T12

POTRERO

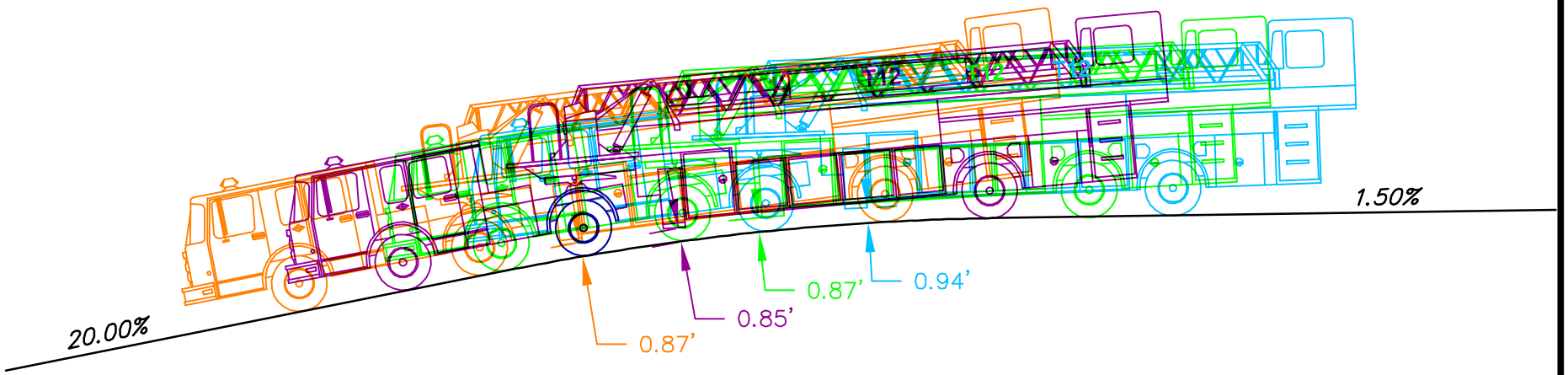
SAN FRANCISCO, CALIFORNIA

APRIL 2016

PROJECT No. 2009013.00



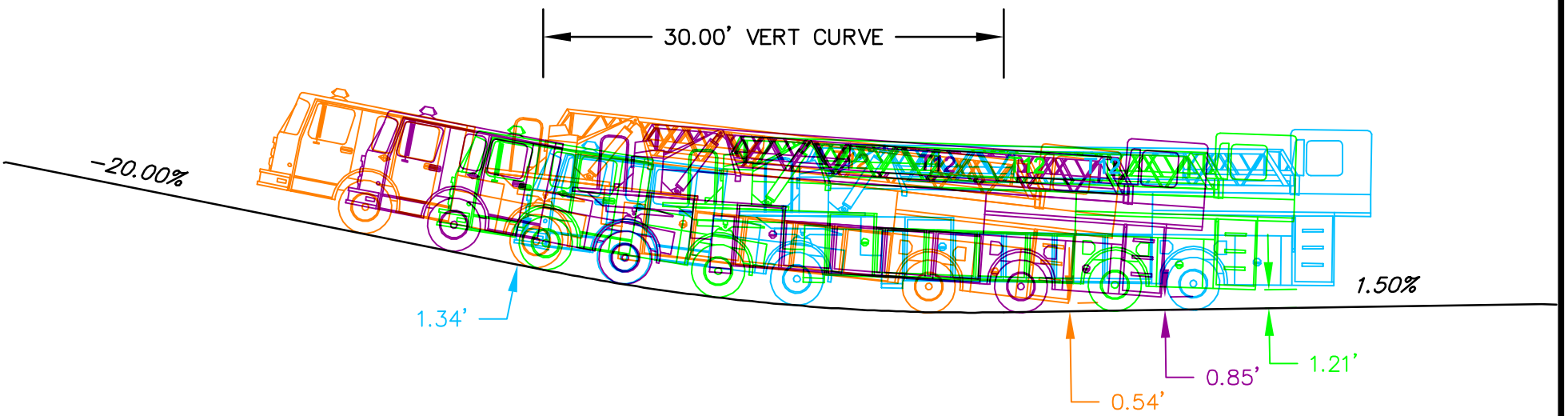
30.00' VERT CURVE



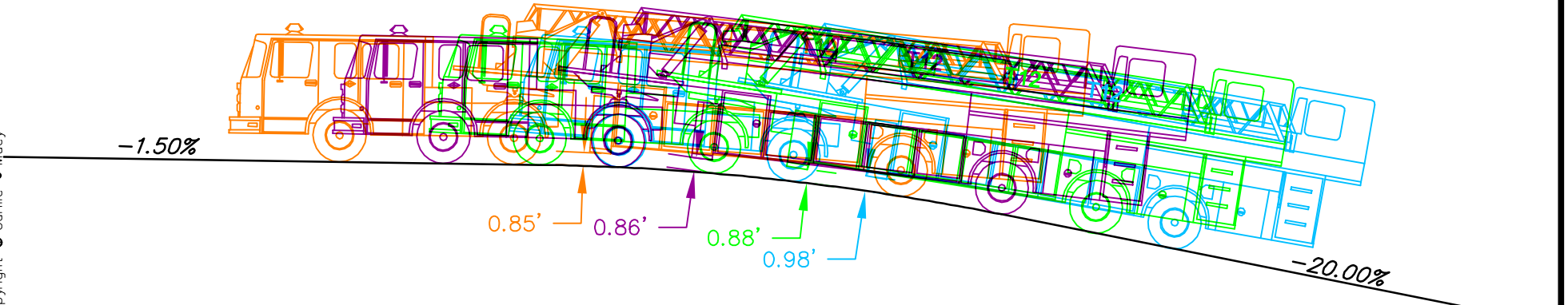
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



[AutoCAD file name: 09013-EXH-201t_vert_curve.dwg] [Xref files: 09013-BA1]
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30' VERTICAL CURVE CHECK

SFFD - AERIAL TRUCK

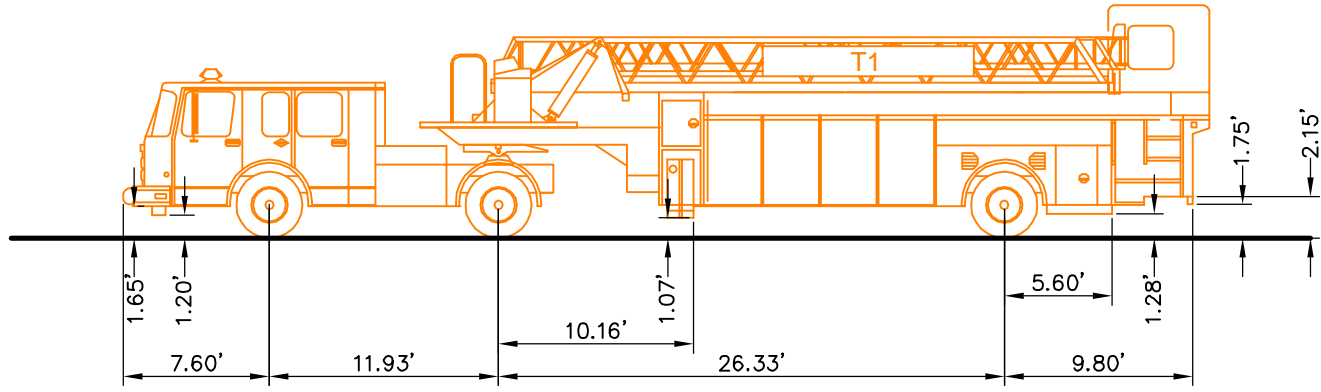
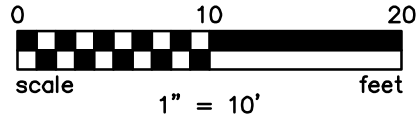
ENGINE T1

POTRERO

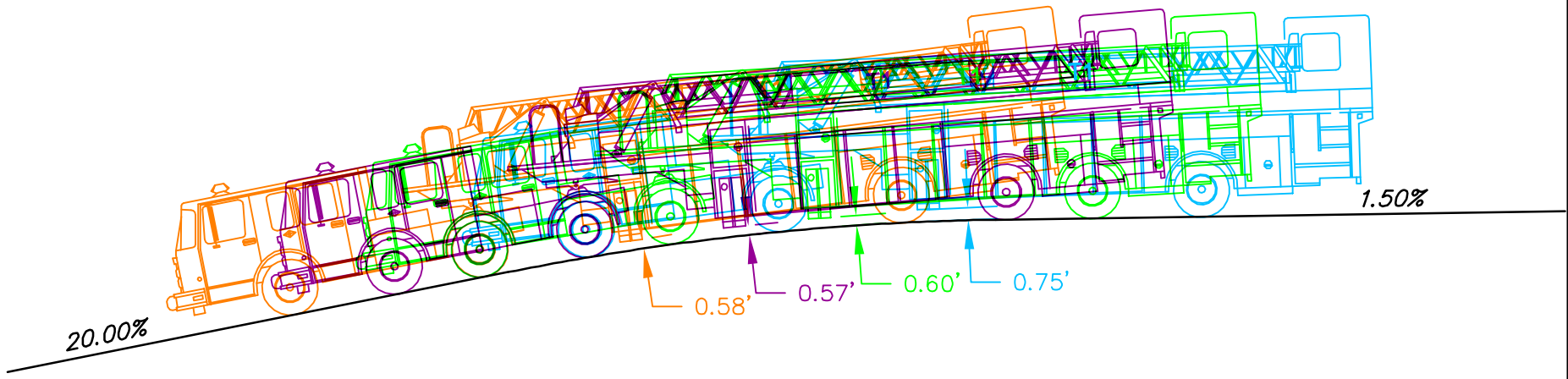
SAN FRANCISCO, CALIFORNIA

APRIL 2016

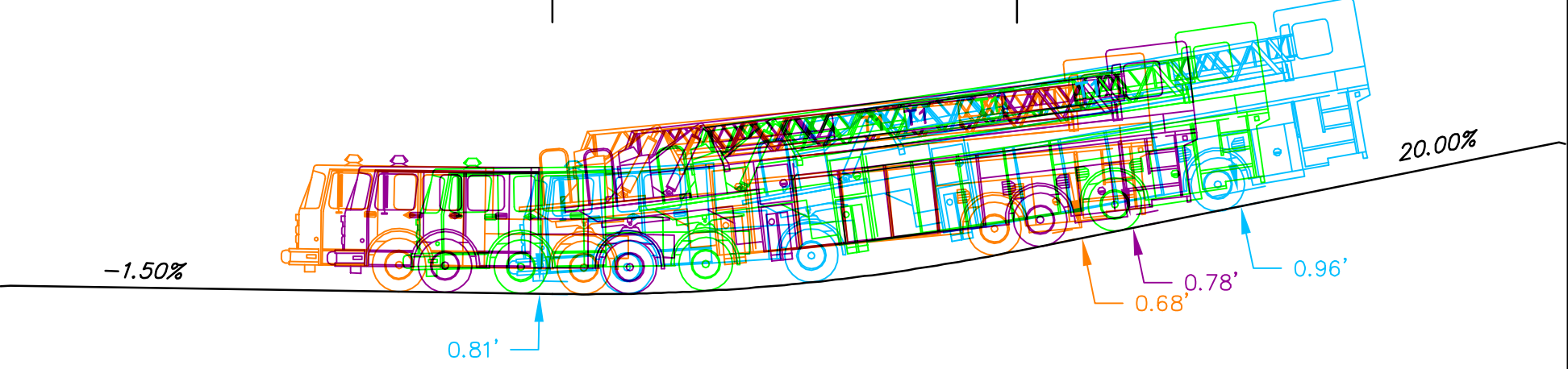
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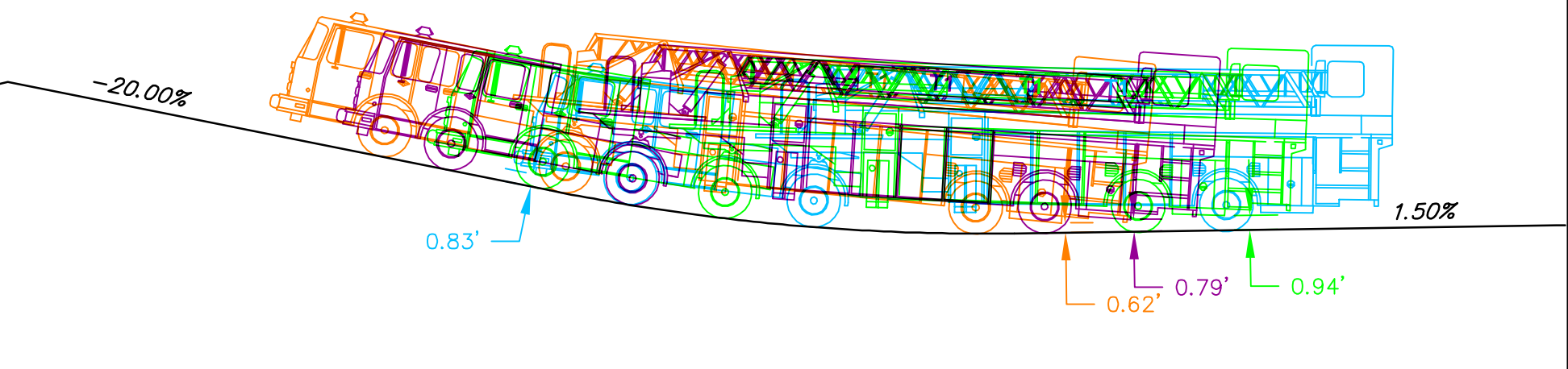
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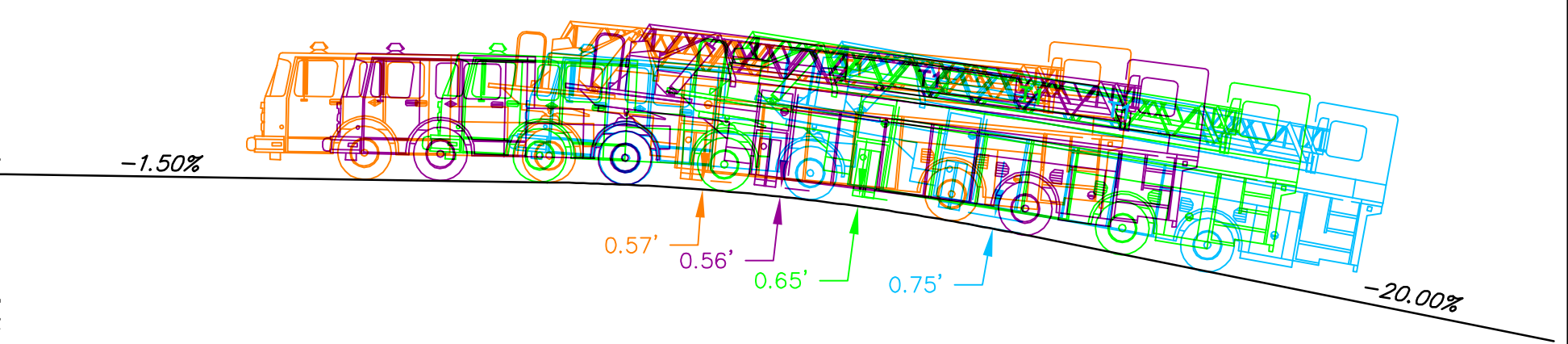
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



[AutoCAD file name: 09013-EXH-201t_vert_curve.dwg] [Xref files: 09013-BA1] Copyright © Carrille • Macey

30' VERTICAL CURVE CHECK

SFFD - ENGINE

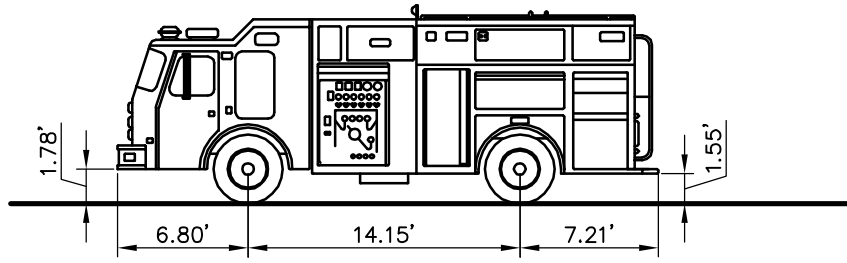
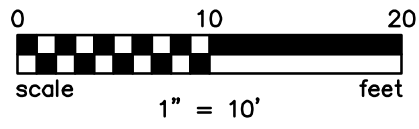
ENGINE 14

POTRERO

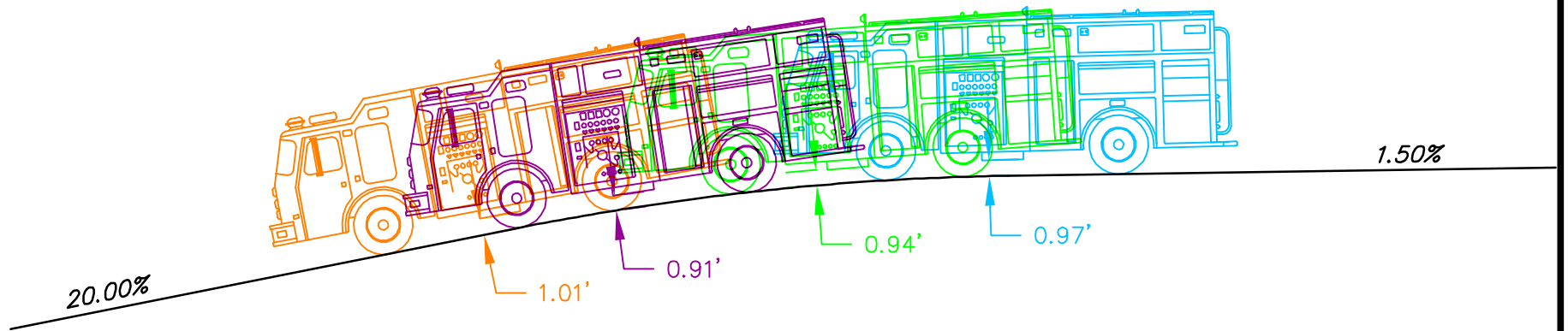
SAN FRANCISCO, CALIFORNIA

APRIL 2016

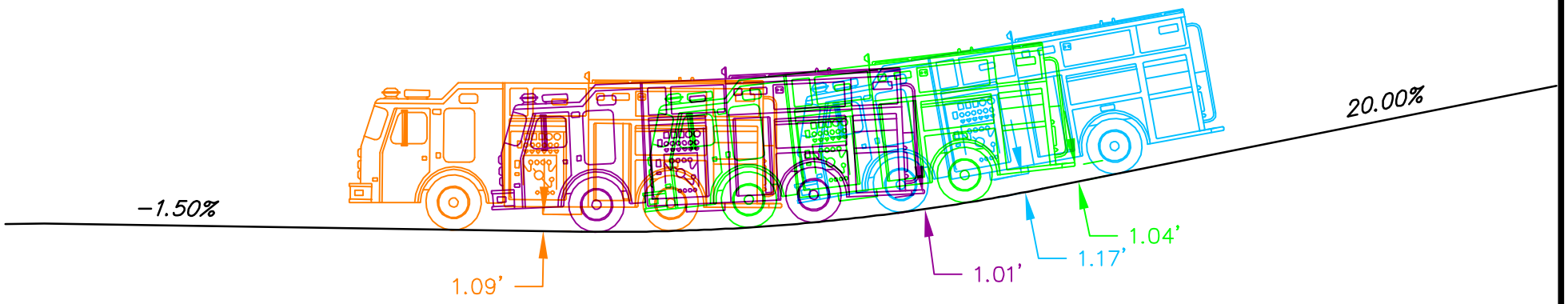
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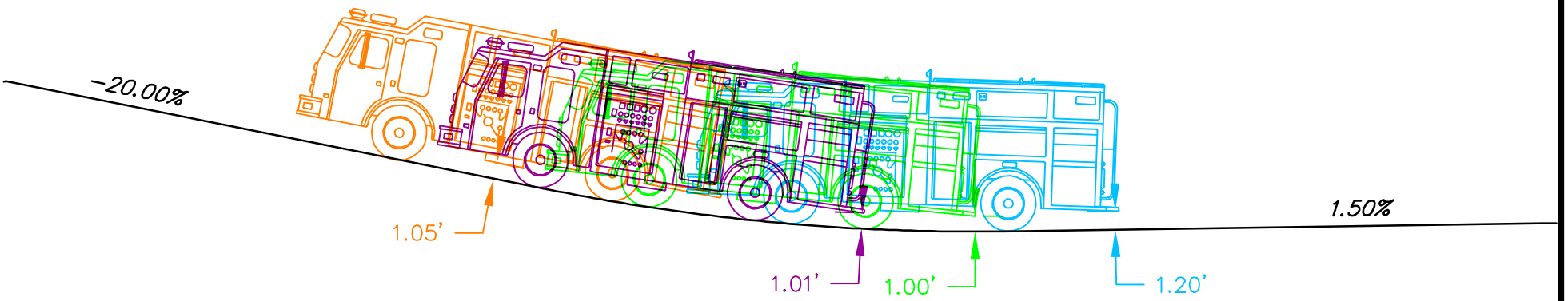
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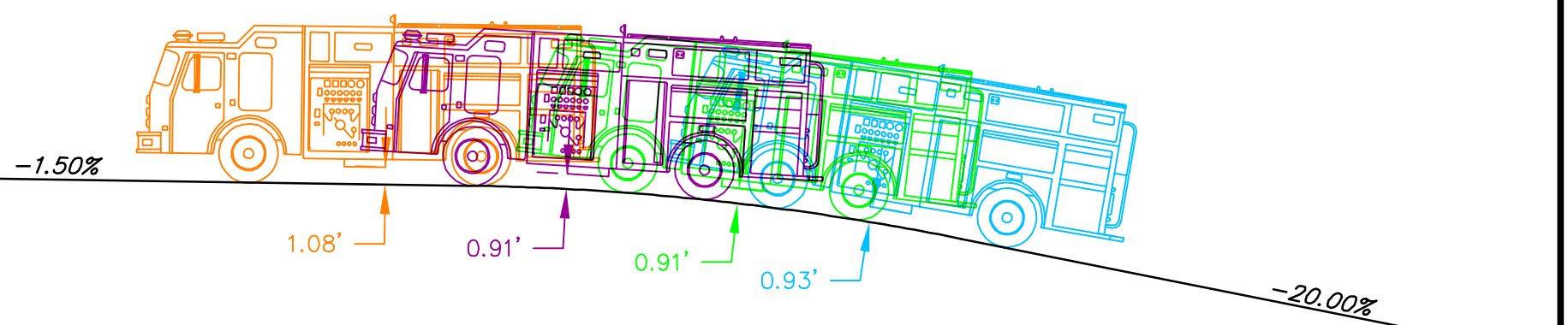
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30.00' VERT CURVE



30.00' VERT CURVE



[AutoCAD file name: 09013-EKH-2016-vert_curve.dwg] [Xref files: 09013-BA1]
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30' VERTICAL CURVE CHECK

SFFD - RESCUE TRUCK

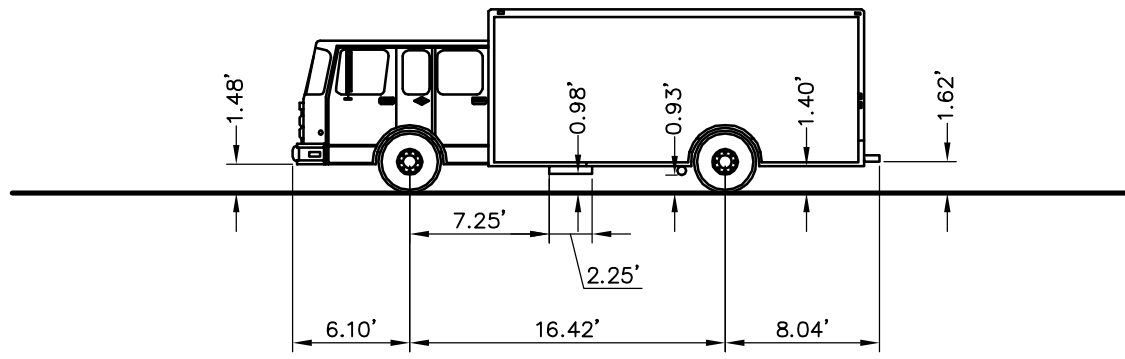
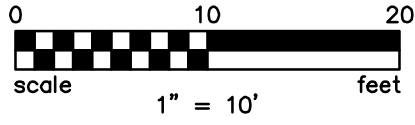
TRUCK R2

POTRERO

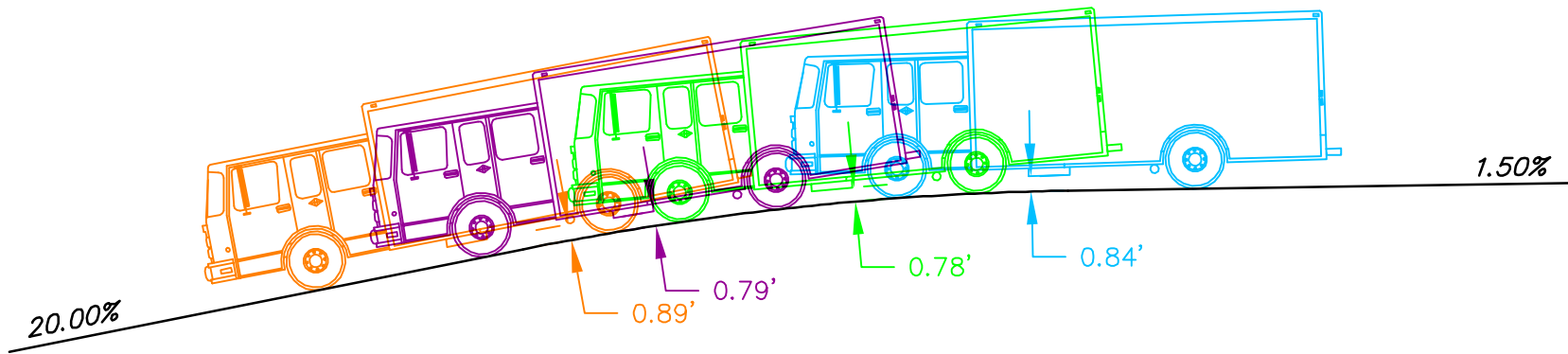
SAN FRANCISCO, CALIFORNIA

APRIL 2016

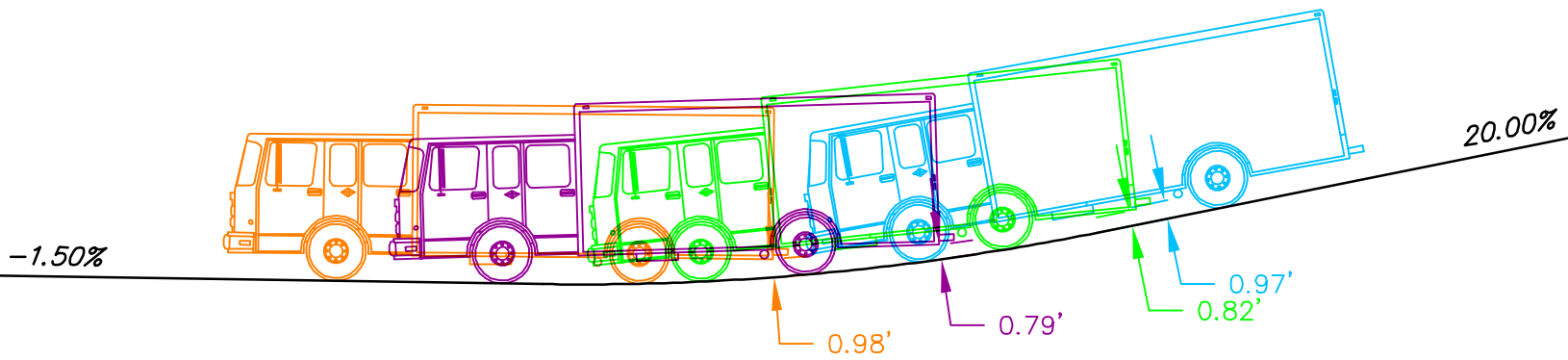
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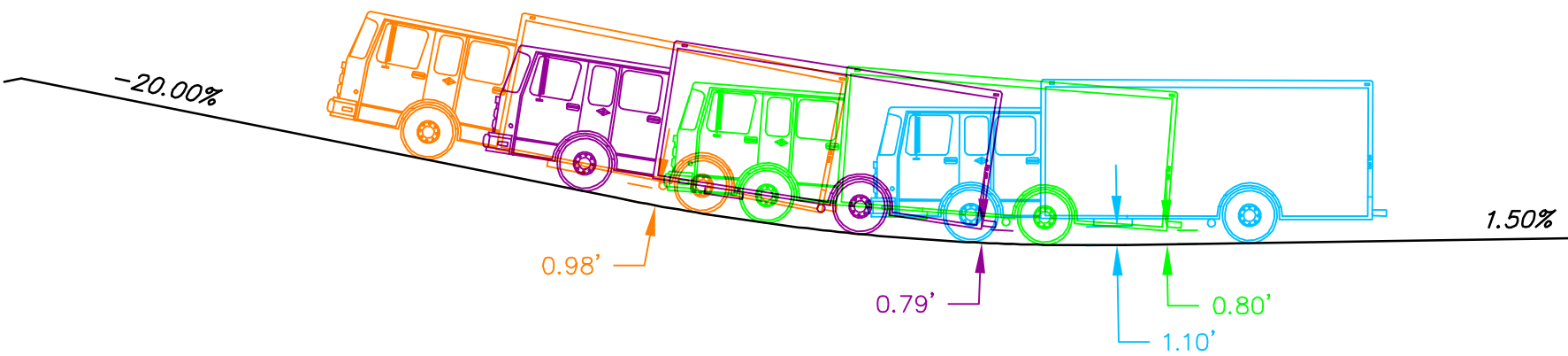
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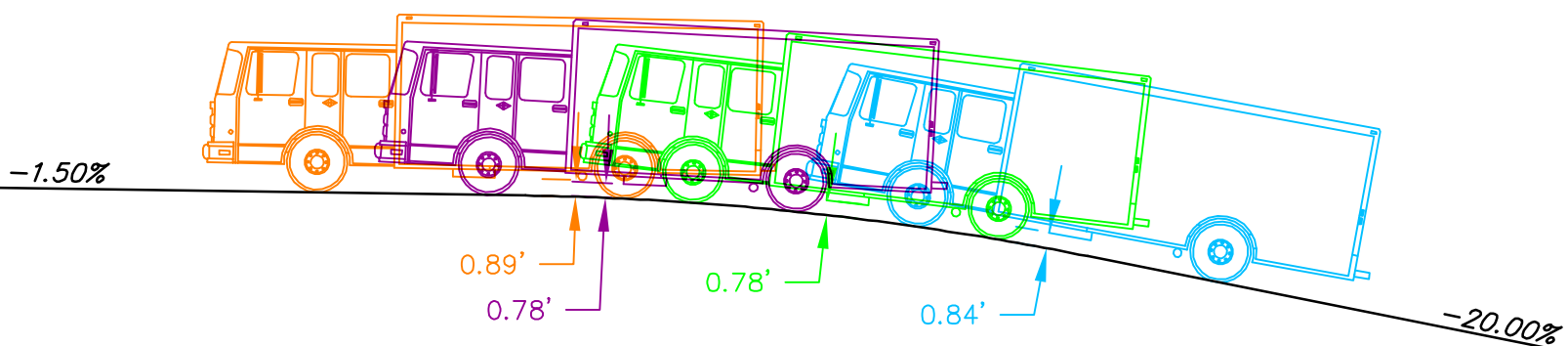
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



30' VERTICAL CURVE CHECK

SFFD - AMBULANCE

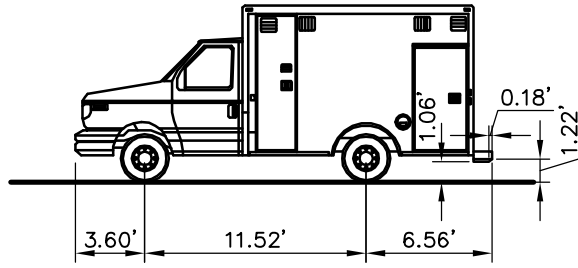
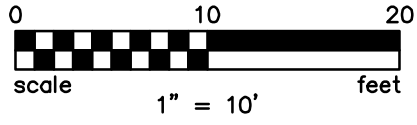
AMBULANCE 763

POTRERO

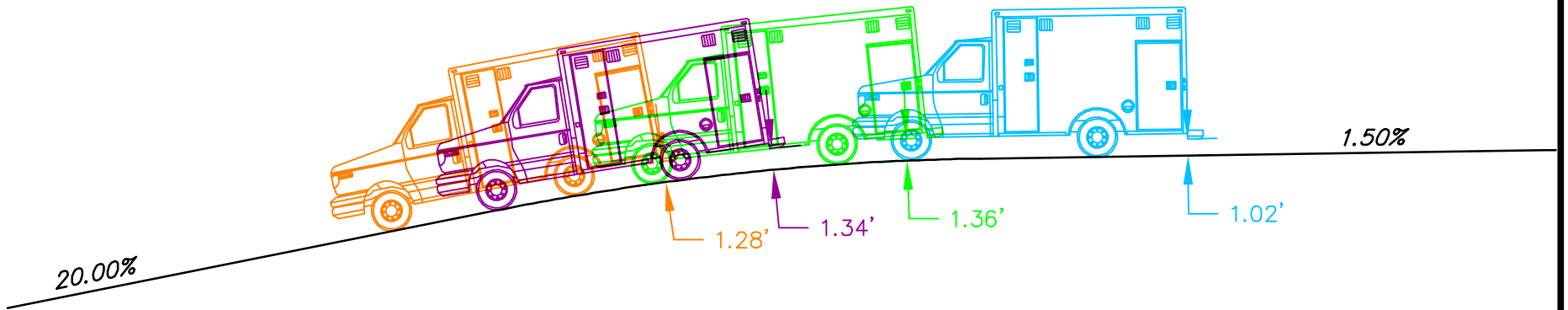
SAN FRANCISCO, CALIFORNIA

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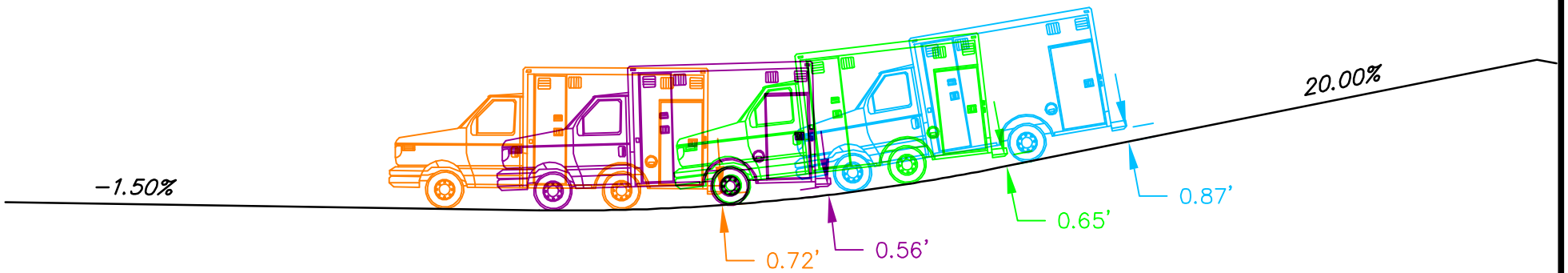
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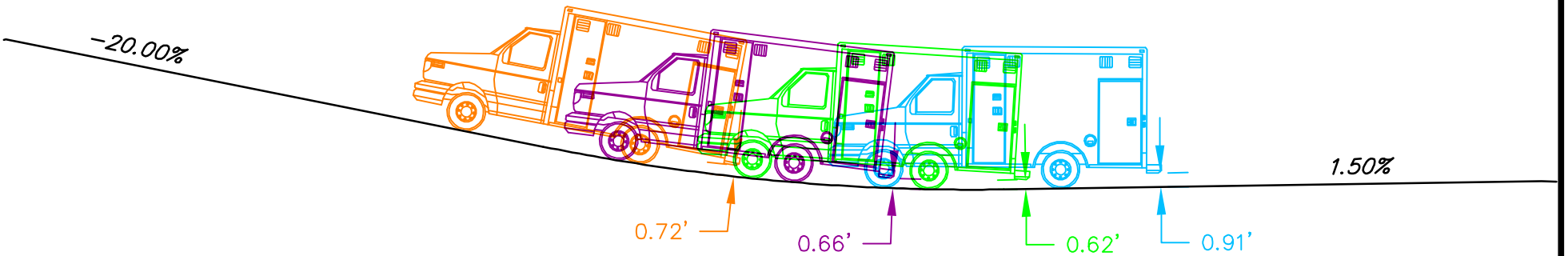
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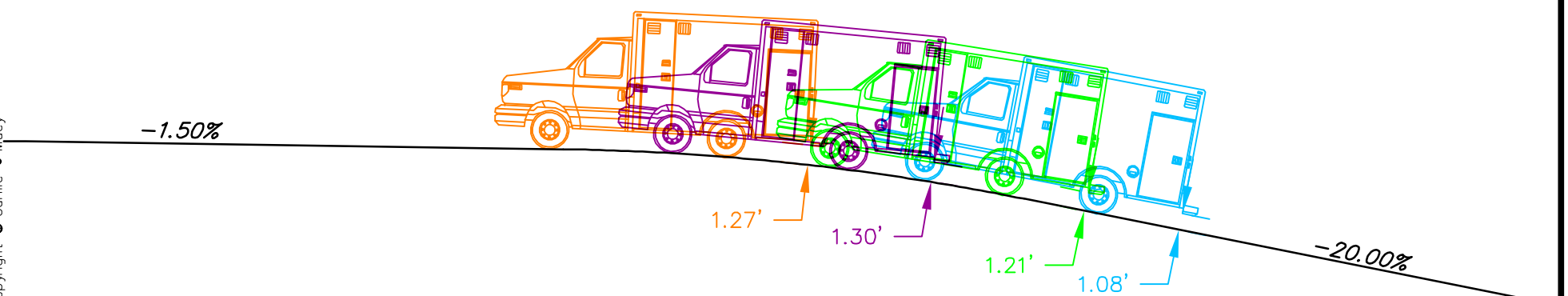
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



30' VERTICAL CURVE CHECK

SFFD - AMBULANCE

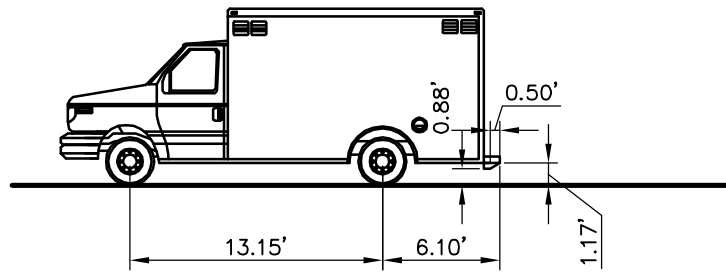
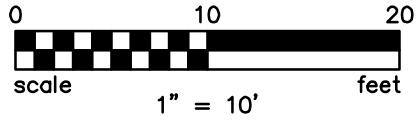
AMBULANCE 749

POTRERO

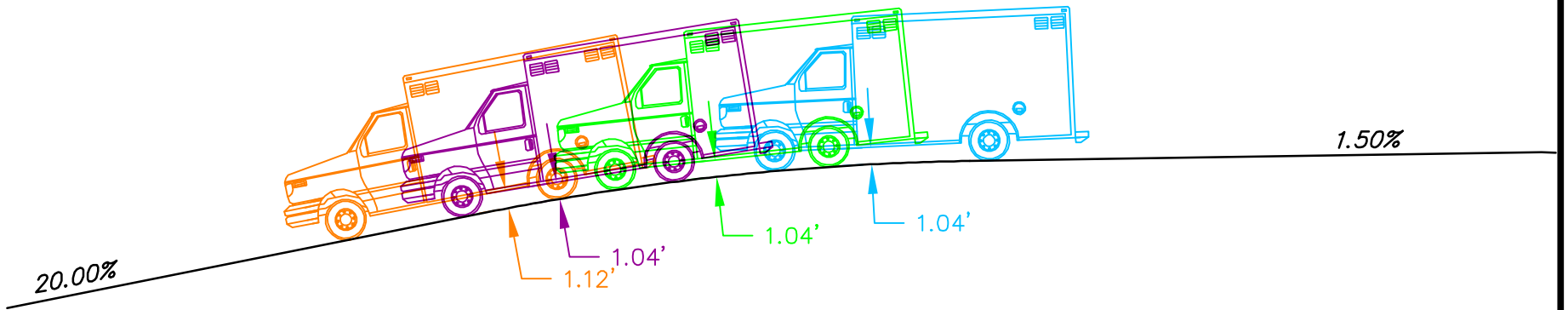
SAN FRANCISCO, CALIFORNIA

APRIL 2016

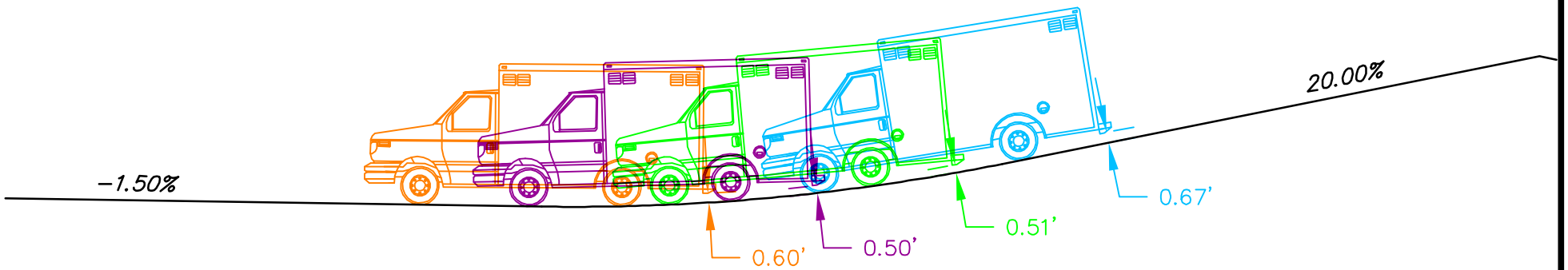
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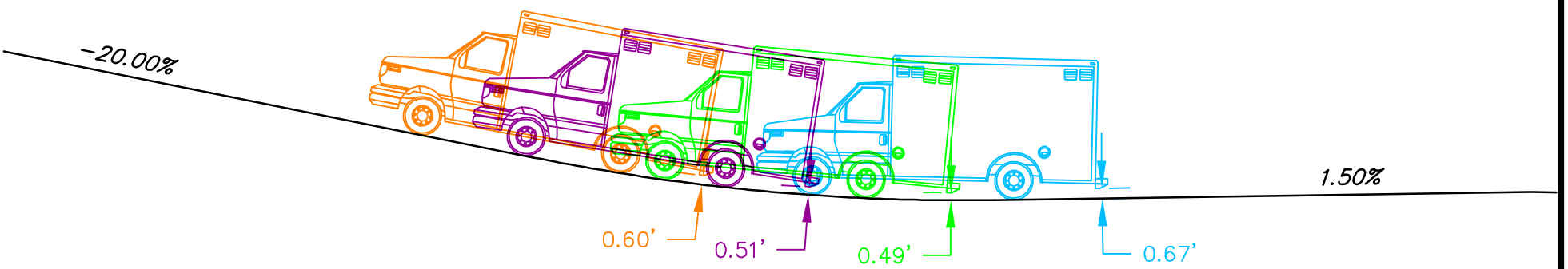
30.00' VERT CURVE



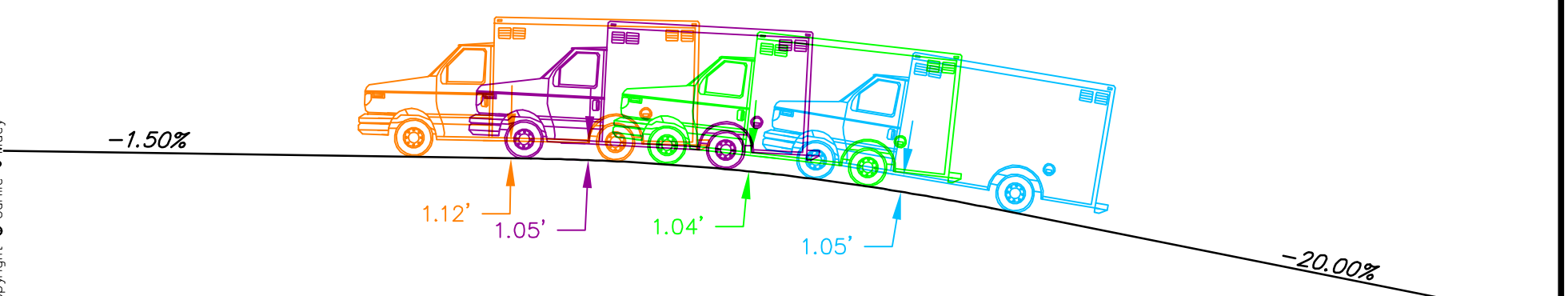
30.00' VERT CURVE



30.00' VERT CURVE



30.00' VERT CURVE



[AutoCAD file name: 09013-EKH-201t_vert_curve.dwg] [Xref files: 09013-BA1] Copyright © Carille • Macy

Appendix D – 11 x 17 Plan Figures

FIGURE I.5 EXISTING UTILITIES

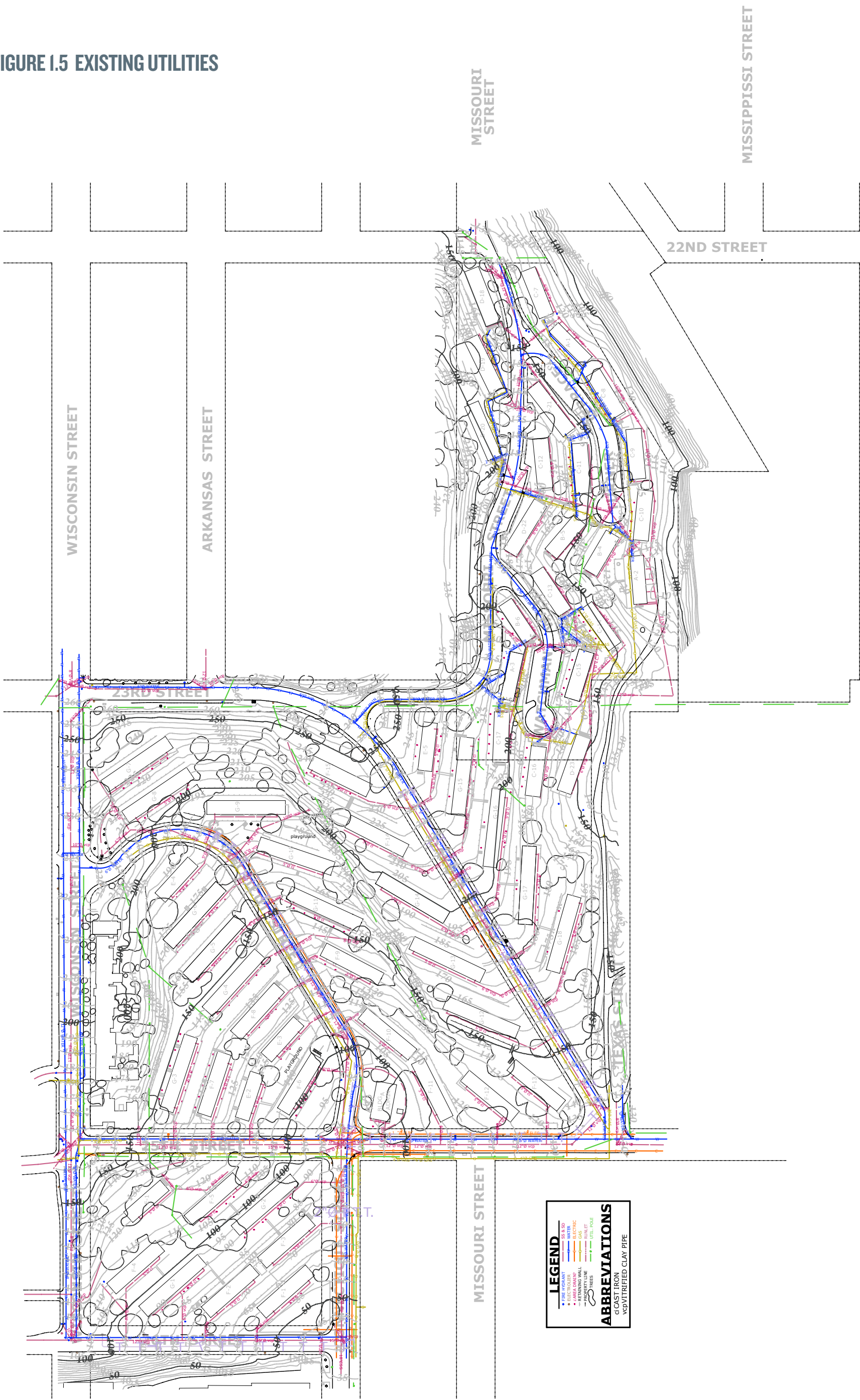


FIGURE 5.1 CONCEPTUAL GRADING PLAN

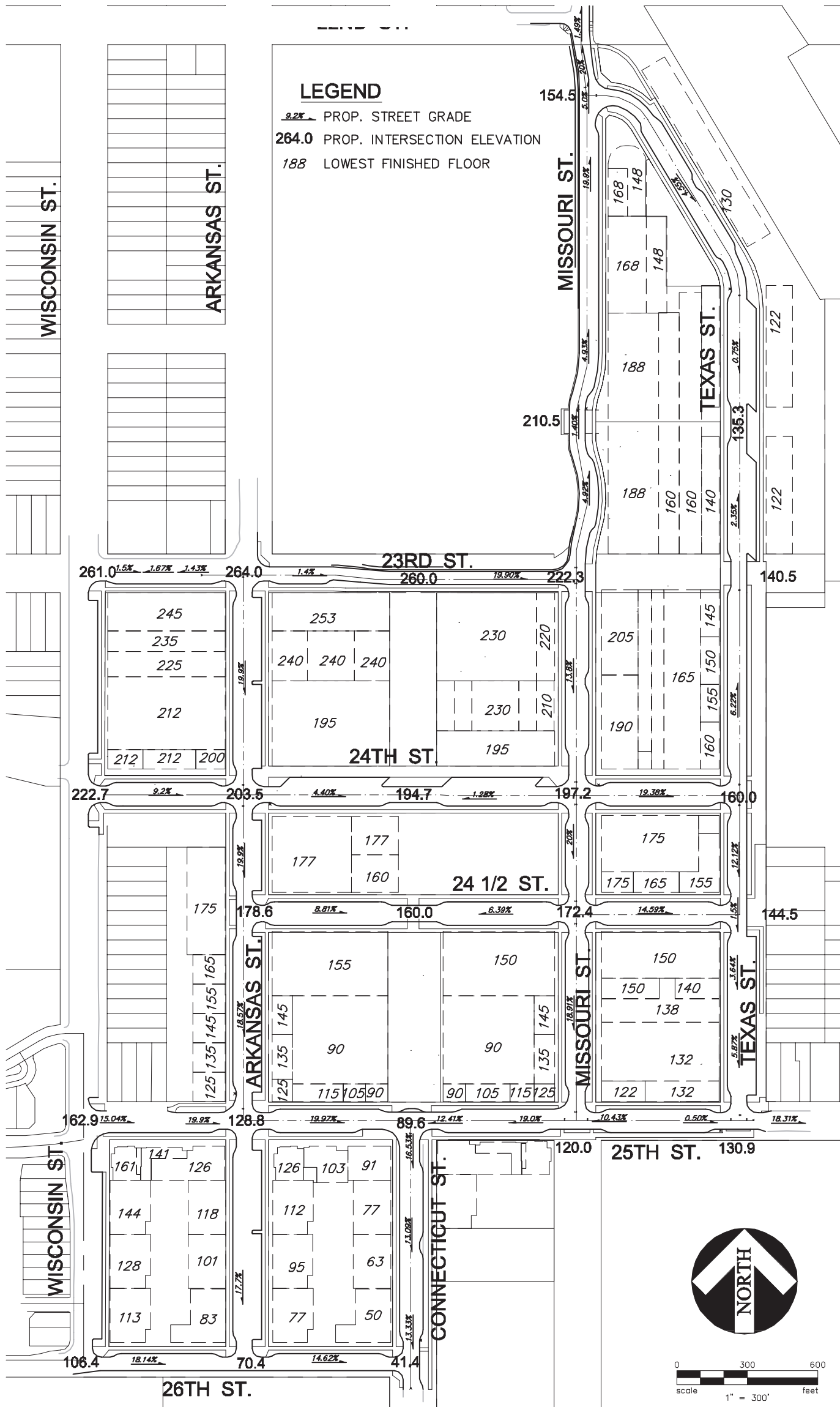


FIGURE 8.2 TYPICAL UTILITY SECTIONS WITHIN PUBLIC STREETS

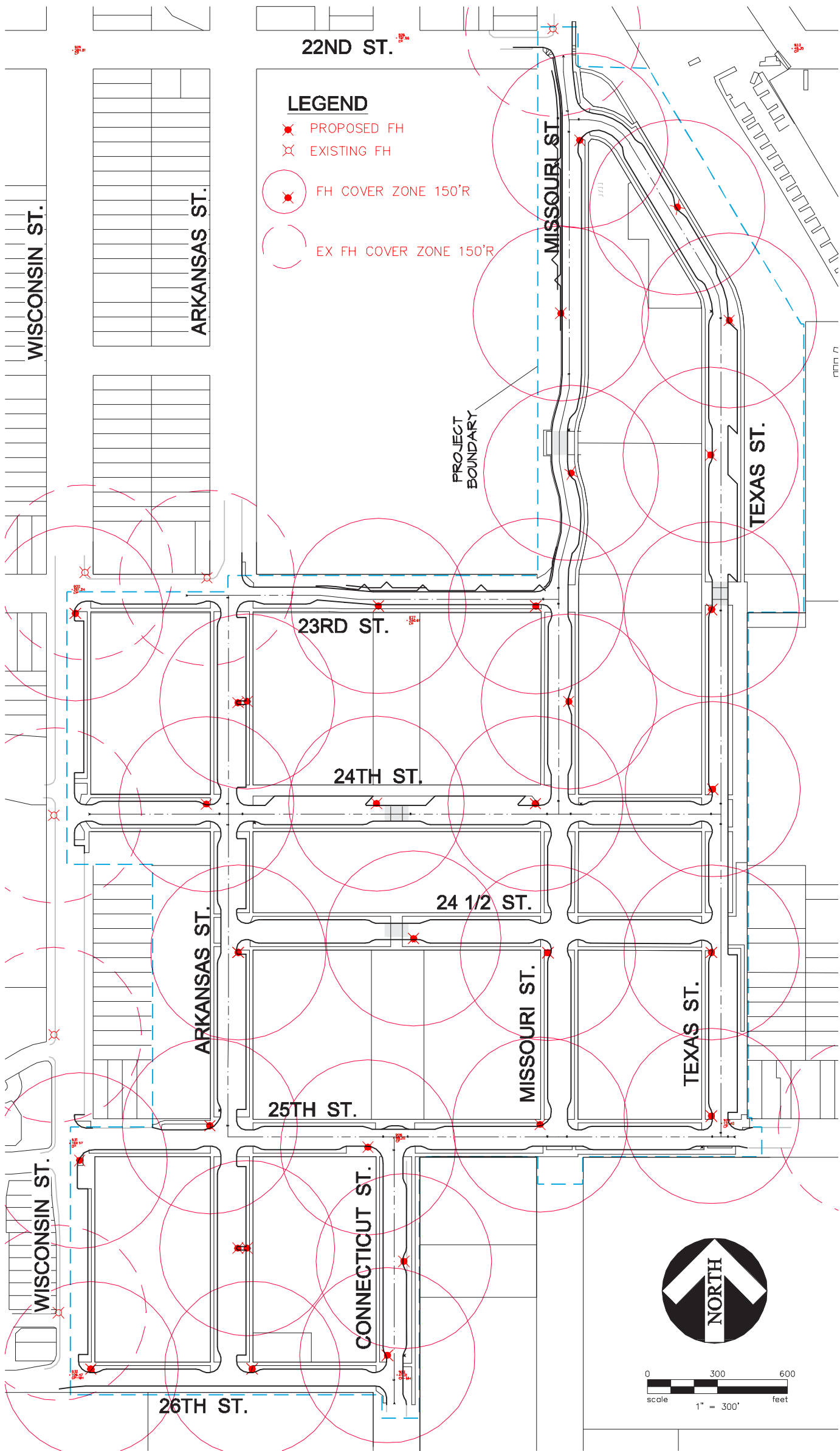


FIGURE 9.1 CONCEPTUAL COMBINED SEWER SYSTEM

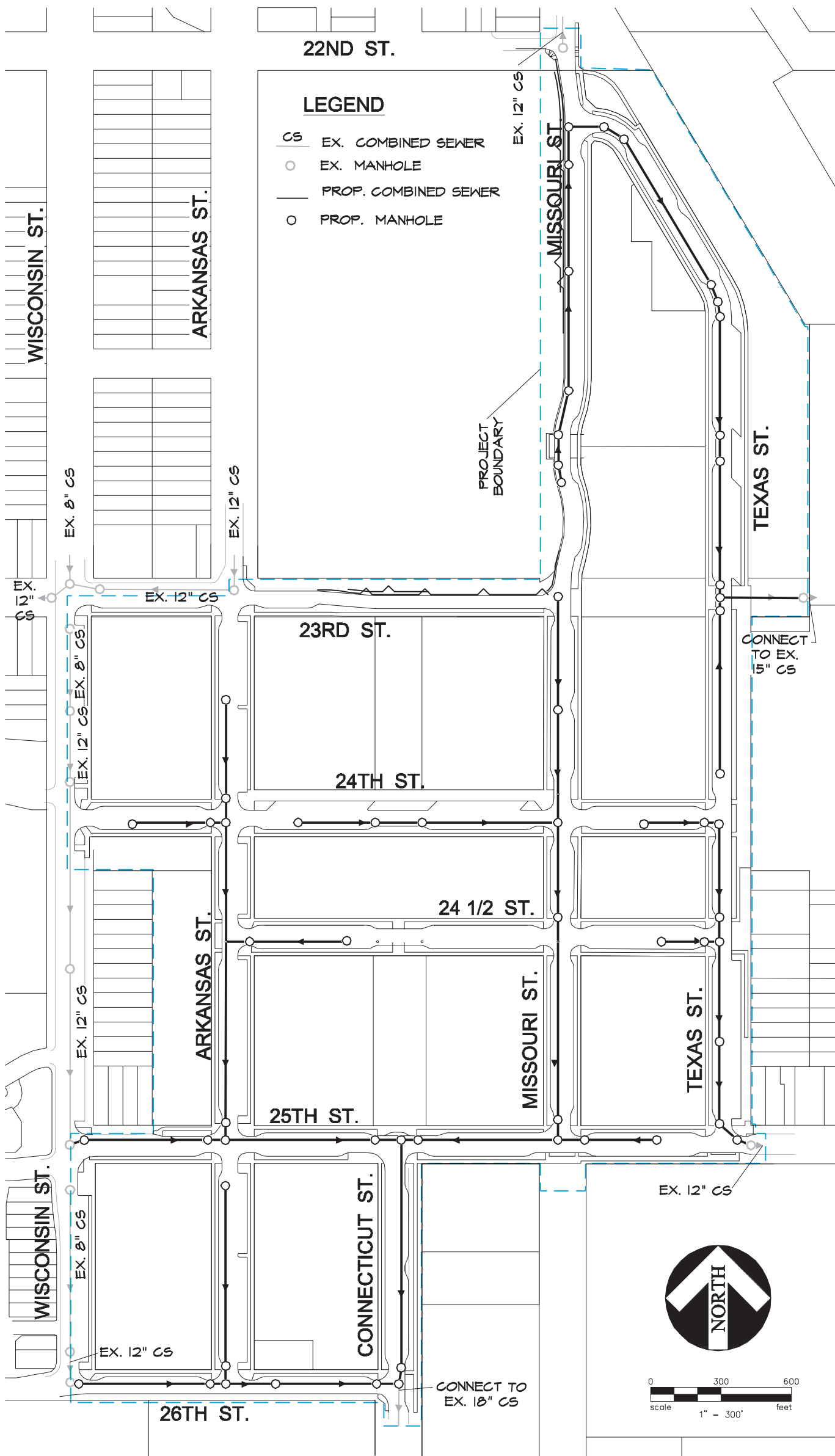


FIGURE 10.1 CONCEPTUAL AWSS SYSTEM DIAGRAM

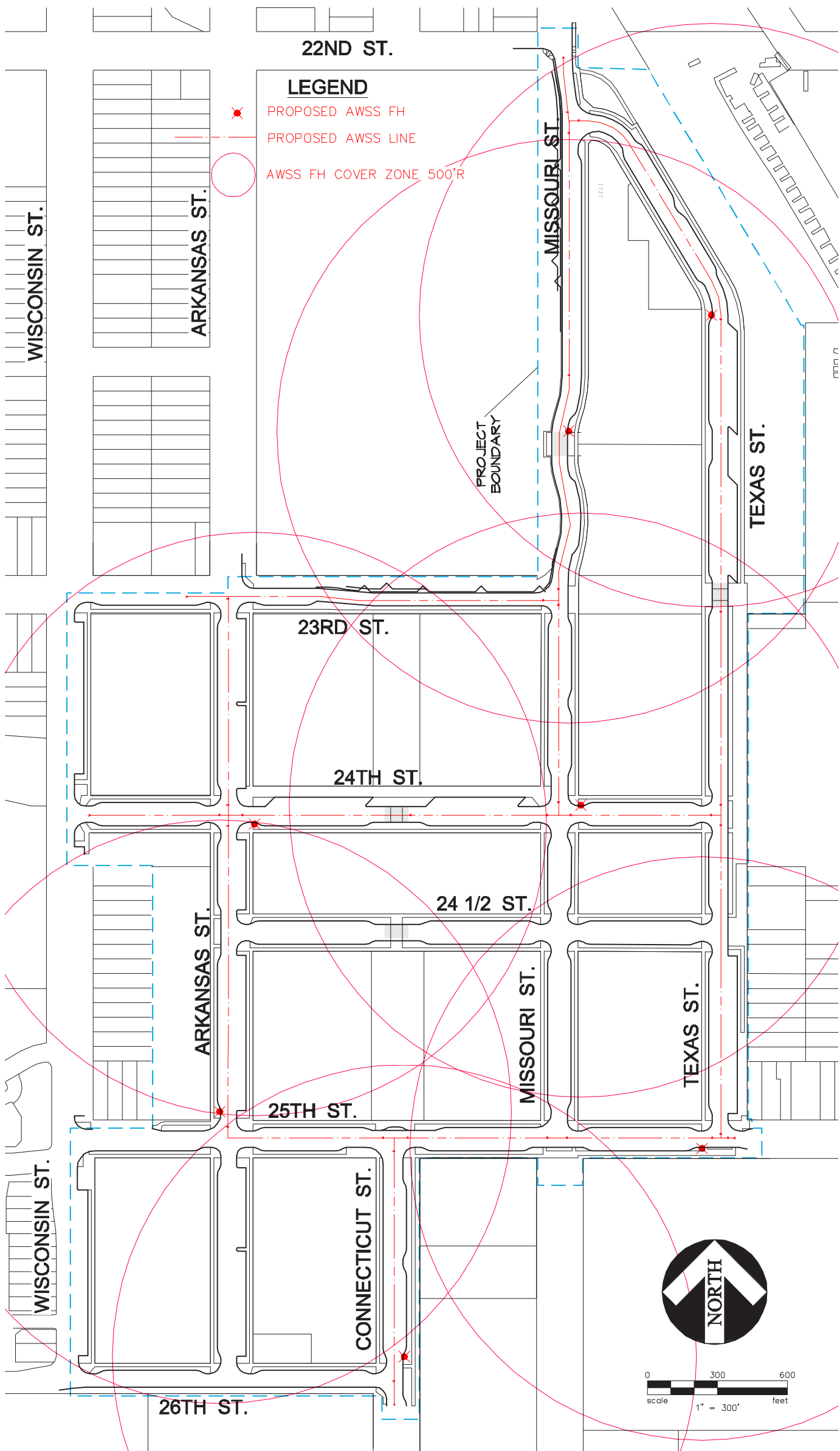


FIGURE II.1 CONCEPTUAL STORMWATER MASTER PLAN

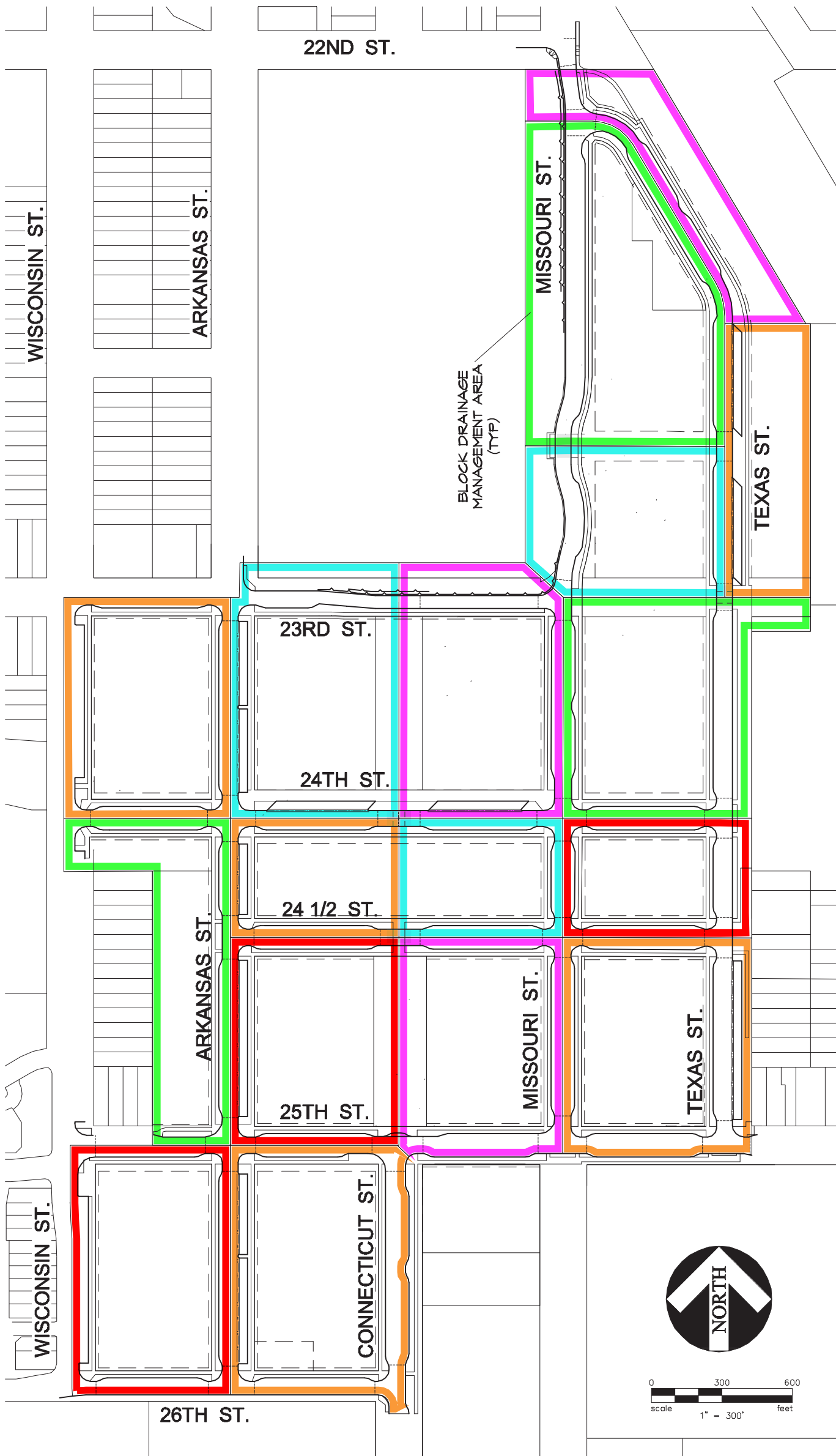


FIGURE 12.1 CONCEPTUAL JOINT TRENCH PLAN

