Memorandum

April 15, 2021

Subject: Sutter Street Extension Project Alternative Descriptions

The following are Alternative Descriptions for each of the alternatives developed for the Sutter Street Extension Project to date.

All of the alternatives extend Sutter Street (St) from its existing terminus at Argonaut Drive (Dr) to Hoffman St. and realign Hoffman St. to connect to Sutter St. The new roadway will be two lanes and have bicycle lanes. The differences in the alternatives are intersection control type and the alignment of Sutter St. and Hoffman St.

Initially, the Technical Memorandum dated October 21, 2020 outlined three preliminary design alternatives (Memo is available on city website). Upon an initial review, Alternative 2 Stopped Control was eliminated due to significant environmental concerns. Alternative 1 and 3 were later presented to the Planning Commission and the public for further consideration at the March 1, 2021 meeting. During the meeting, additional considerations were brought up and as a result, Alternative 1 a, Alternative 3a and 3b were prepared at the request of the City.

The following Alternative Descriptions were developed to supplement the original October 21, 2020 memorandum. This paper summarizes all of the available alternatives, including the original Alternative 1 and 3, and the additional alternatives of 1a, 3a and 3b.

It is our hope that this information is helpful to the City in selecting a design for the Sutter St. Extension project.

Sincerely,

Lindsey Van Parys, PE

Project Manager

Alternative 1: Stop Controlled (Original Alternative 1 dated October 21, 2021)

Alternative Description: This alternative extends Sutter St. and introduces horizontal curves to minimize impacts to the EPA's water channel. Hoffman Street T's into Sutter Street and is proposed to be stop controlled. To minimize impacts to adjacent features and the proposed water channel, this alternative does not meet all City design standards.

This alternative provides a sidewalk along the north side of Sutter St. west of the intersection of Hoffman St, where the sidewalk terminates, and a crosswalk is provided across Sutter St. and continues east to the school. An additional crosswalk is provided at Argonaut Drive. Striped bicycle lanes are provided for the eastbound and westbound direction.

	Advantages	Disadvantages
Design Standards		Non-standard curves on Sutter St. and Hoffman St. Does not meet design speed standards (see safety discussion). 20mph curves on a 45mph/35mph facilities
Cost	Less expensive than the roundabout	Tall and extensive retaining walls
Impacts to EPA[1] improvements and tailings	Reduces impacts to channel and tailings site	Needs retaining wall to minimize impacts
Impacts to environmental features	Minimized construction footprint, minimizes impacts to wetlands	Impacts existing vegetation and trees
Impacts to private property	Sutter St. is placed as far away from existing residents as possible	Requires acquisition or easements from 4 properties. Breaking noise concerns
Intersection Modifications	Smaller construction footprint	There are no physical constraints to control driver speed and longer pedestrian crossing distances
Roadway Alignment	Aligns Sutter St to be the "priority"/major street	Curves and slope will cause sight distance challenges. Curve on Hoffman approaching the intersection creates a blind stop.
Pedestrian/Bicycle Safety	Dedicated sidewalk and bike lane	Crossing is in a challenging location from a sight distance standpoint. There are more conflict points[2] The crossing distance and exposure times are longer[2] Stop controlled intersections have a higher pedestrian collision rates by about 40%[2]
Vehicle Safety		The roadway will be designed for a slower speed than the posted speed limits and curve warning will need to be placed. Stopping sight distance will not be met so advanced warning signs will be needed. There are more conflict points[2] Stop controlled intersections have higher fatal/serious injury collision rates by ~83%[2]

[1]EPA = Environmental Protection Agency [2] Than compared to a roundabout intersection.

Alternative 1 a: Stop Controlled (Location 2. Considered on March 1, 2021)

Alternative Description: This alternative is the same as Alternative 1 except it moves the intersection further west and thereby pushes Hoffman Street further south to allow for the connection to Sutter Street. All other alternative features are the same.

	Advantages	Disadvantages
Design Standards		Same non-standard curves on Sutter St. as Location 1. Radius improved on Hoffman St. but still does not meet design speed standards (see safety discussion).
Cost		More expensive than location 1
Impacts to EPA[1] improvements and tailings	Same as location 1	Same as location 1
Impacts to environmental features	Same as location 1	Same as location 1
Impacts to private property	Moves further away from private residences	Requires acquisition or easements from 5 properties.
Intersection Modifications	Same as location 1	Same as location 1
Roadway Alignment	Same as location 1, and provides better site distance on Sutter St. than location 1	Same as location 1 but introduces a second non standard curve on Hoffman St
Pedestrian/Bicycle Safety	Same as location 1	Same as location 1
Vehicle Safety		Same as location 1

[1]EPA = Environmental Protection Agency [2] Than compared to a roundabout intersection.

Alternative 3: Roundabout Controlled (Original Alternative 3 dated October 21, 2021)

Alternative Description: This alternative extends Sutter St. and introduces a horizontal curve to provide speed deflection into the intersection with Hoffman St. The intersection with Hoffman St is proposed to be yield controlled by means of a roundabout.

This alternative provides a sidewalk along the north side of Sutter St. west of the intersection of Hoffman St until just before the crosswalk on the west side of the intersection. Bicycle lanes are provided on both sides of the street until this location as well. The bicycle lanes terminate at a bicycle ramp into a shared use path. The shared use path runs along the north and south sides of the intersection and connects to the crosswalks so cyclists and pedestrians can use it to traverse the roundabout. Crosswalks are provided on all three legs of the roundabout to accommodate the recreational cyclist. Avid cyclists may exit the bicycle lane and traverse the roundabout as a vehicle. East of the intersection the sidewalk is constructed on the south side of Sutter St. and continues east to the school. An additional crosswalk is provided at Argonaut Drive. Striped bicycle lanes are provided for the eastbound and westbound direction.

	Advantages	Disadvantages
Design Standards	Meets all design standards and slower curve benefits roundabout safety	
Cost	Better life cycle costs	More costly than the signal alternative
Impacts to EPA[1] improvements and tailings	Reduces impacts to channel and tailings site	Needs a retaining wall to minimize impacts, same as Alternative 1
Impacts to environmental features	Provides locations for planting and landscaping	Impacts existing vegetation and trees
Impacts to private property	Reduces braking noise and slows cars reducing road noise in general	Requires acquisition or easements from 4 properties, same as Alternative 1. Sidewalk is closer to private property
Intersection Modifications	Slower speeds, stop only when necessary, reduces driver delay, reduces emissions, improves safety	More lighting is needed.
Roadway Alignment		Gives the appearance Hoffman St and Sutter St have equal priority. Additional signing and striping will be needed to mitigate this
Pedestrian/Bicycle Safety	Dedicated sidewalk, shared use path and bike lanes Pedestrians only cross one lane of travel at time[2] Reduced conflict points[2] Significantly safer[2]	
Vehicle Safety	The roadway will be designed to gradually slow drivers in a controlled environment. There are less conflict points[2] Significantly safer[2]	

[1]EPA = Environmental Protection Agency [2] Than compared to stop or signal controlled intersections

Alternative 3 a: Roundabout Controlled (Location 2. Considered on March 1, 2021)

Alternative Description: This alternative is the same as Alternative 3 except it moves the intersection further west and thereby pushes Hoffman Street further south to allow for the connection to Sutter Street. All other alternative features are the same.

	Advantages	Disadvantages
Design Standards	Same as Alternative 3, Location 1	
Cost		More costly than Alternative 3, Location 1
Impacts to EPA[1] improvements and tailings		Impacts the tailings and the channel
Impacts to environmental features		Impacts more vegetation and trees than Alternative 3, Location 1
Impacts to private property	Moves the intersection the furthest away from the residences than any other alternative. Reduces braking noise and slows cars reducing road noise in general	Requires acquisition or easements from 5 properties.
Intersection Modifications	Same as Alternative 3, Location 1	Same as Alternative 3, Location 1
Roadway Alignment	Gives equal priority to Sutter St and Hoffman St	
Pedestrian/Bicycle Safety	Same as Alternative 3, Location 1	
Vehicle Safety	Same as Alternative 3, Location 1	

[1]EPA = Environmental Protection Agency

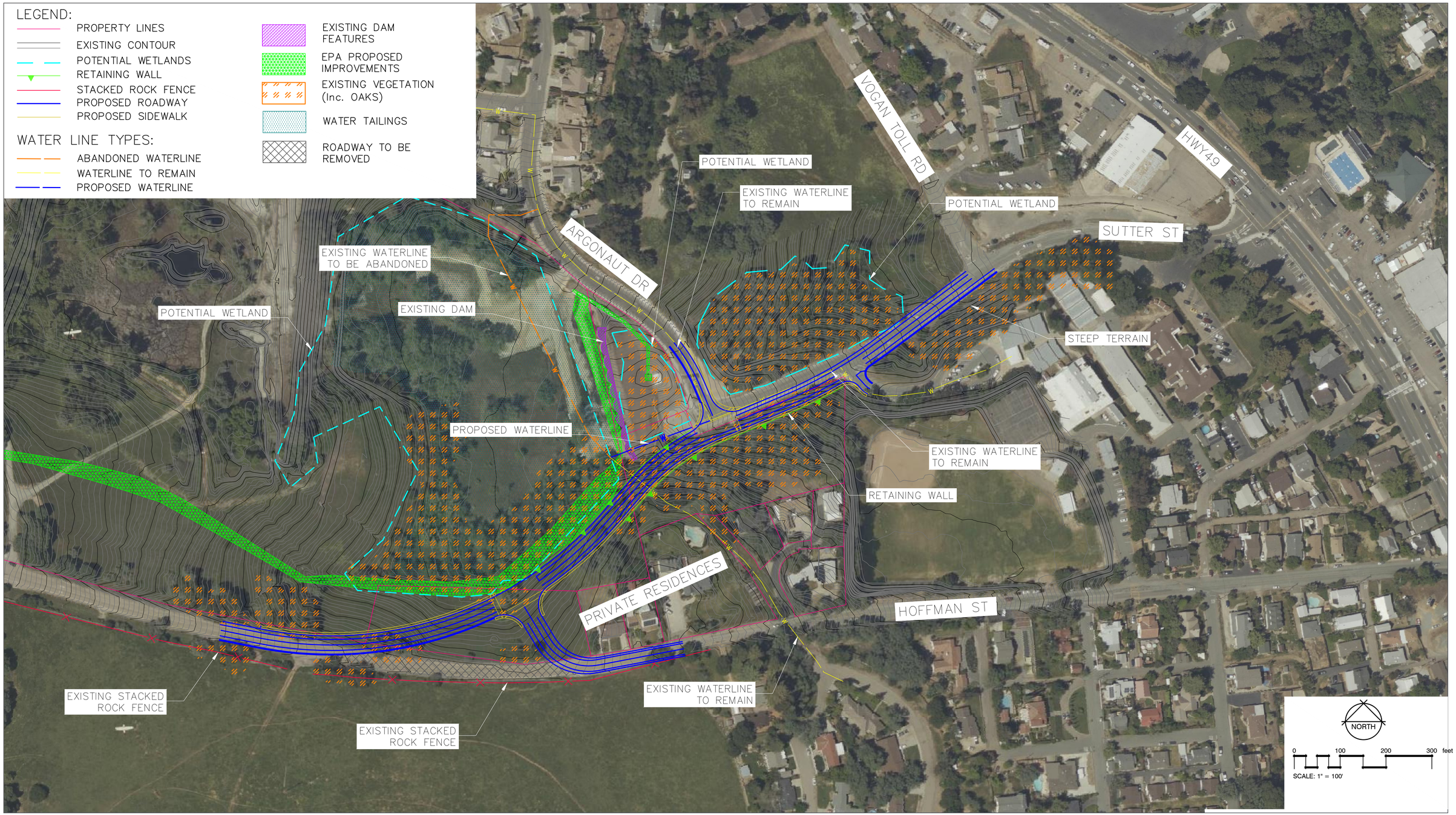
Alternative 3 b: Roundabout Controlled (Location 3. Considered on March 1,2021)

Alternative Description: This alternative is the same as Alternative 3 except it moves the intersection further south onto the vacant lot. All other alternative features are the same.

	Advantages	Disadvantages
Design Standards	Same as Alternative 3, Location 1	
Cost	Same as Alternative 3, Location 1	More costly Alternative 3, Location 1
Impacts to EPA[1] improvements and tailings	Same as Alternative 3, Location 1	Same as Alternative 3, Location 1
Impacts to environmental features		Impacts more vegetation and trees than Alternative 3, Location 1
Impacts to private property	Moves the intersection the furthest away from the residences than any other alternative. Reduces braking noise and slows cars reducing road noise in general	Requires acquisition or easements from 4 properties, but more than Alternative 3, Location 1
Intersection Modifications	Same as Alternative 3, Location 1	Same as Alternative 3, Location 1
Roadway Alignment		Gives the appearance Hoffman St and Sutter St have equal priority. Additional signing and striping will be needed to mitigate this
Pedestrian/Bicycle Safety	Same as Alternative 3, Location 1	
Vehicle Safety	Same as Alternative 3, Location 1	

[1]EPA = Environmental Protection Agency

Alternative 1- Stop Controlled



SUTTER STREET EXTENSION PROJECT

Jackson, California

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GHD Inc.

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Alternative 1a- Stop Controlled (Location 2)

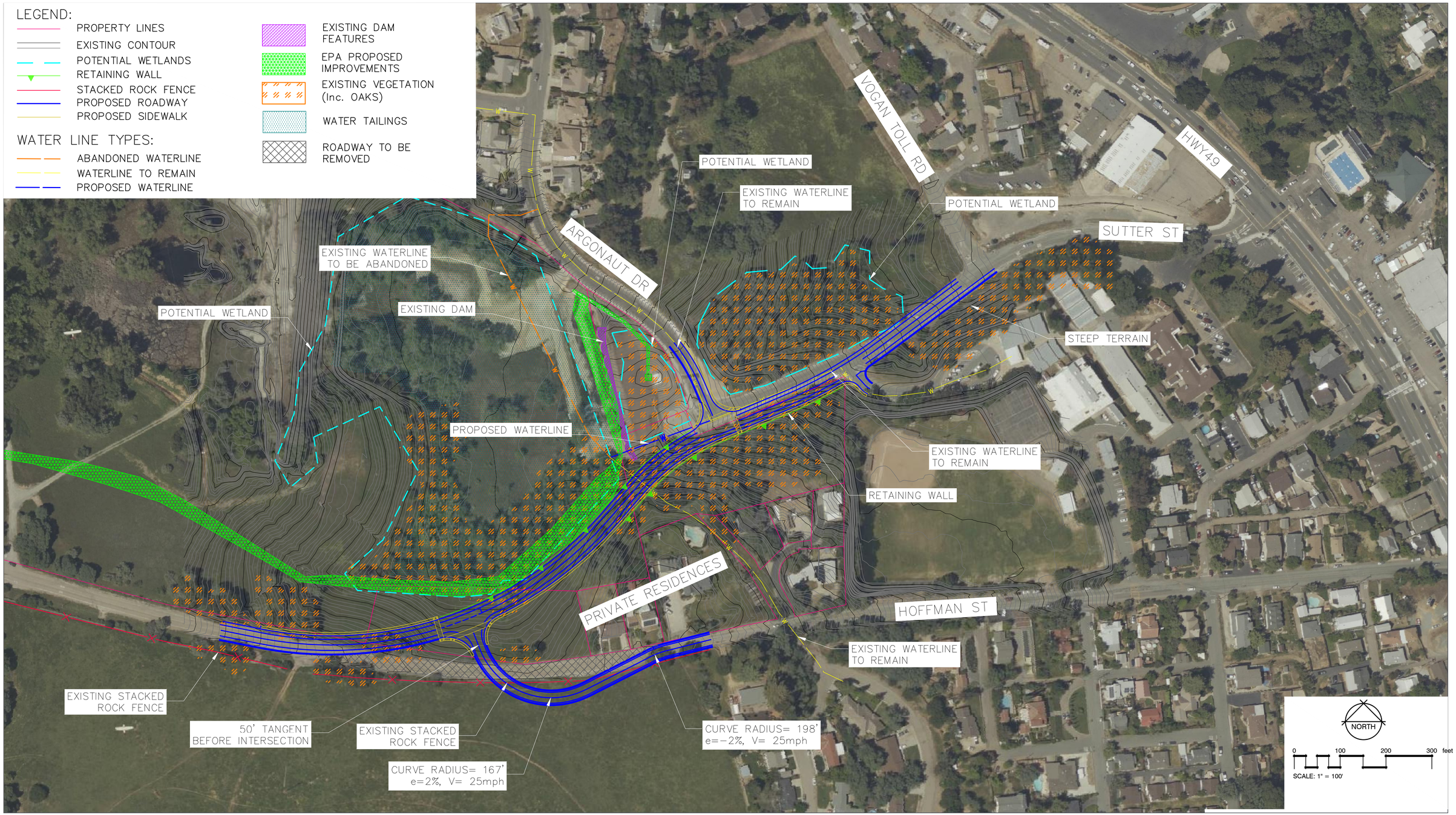
LEGEND:

- PROPERTY LINES
- EXISTING CONTOUR
- POTENTIAL WETLANDS
- RETAINING WALL
- STACKED ROCK FENCE
- PROPOSED ROADWAY
- PROPOSED SIDEWALK

WATER LINE TYPES:

- ABANDONED WATERLINE
- WATERLINE TO REMAIN
- PROPOSED WATERLINE

- EXISTING DAM FEATURES
- EPA PROPOSED IMPROVEMENTS
- EXISTING VEGETATION (Inc. OAKS)
- WATER TAILINGS
- ROADWAY TO BE REMOVED



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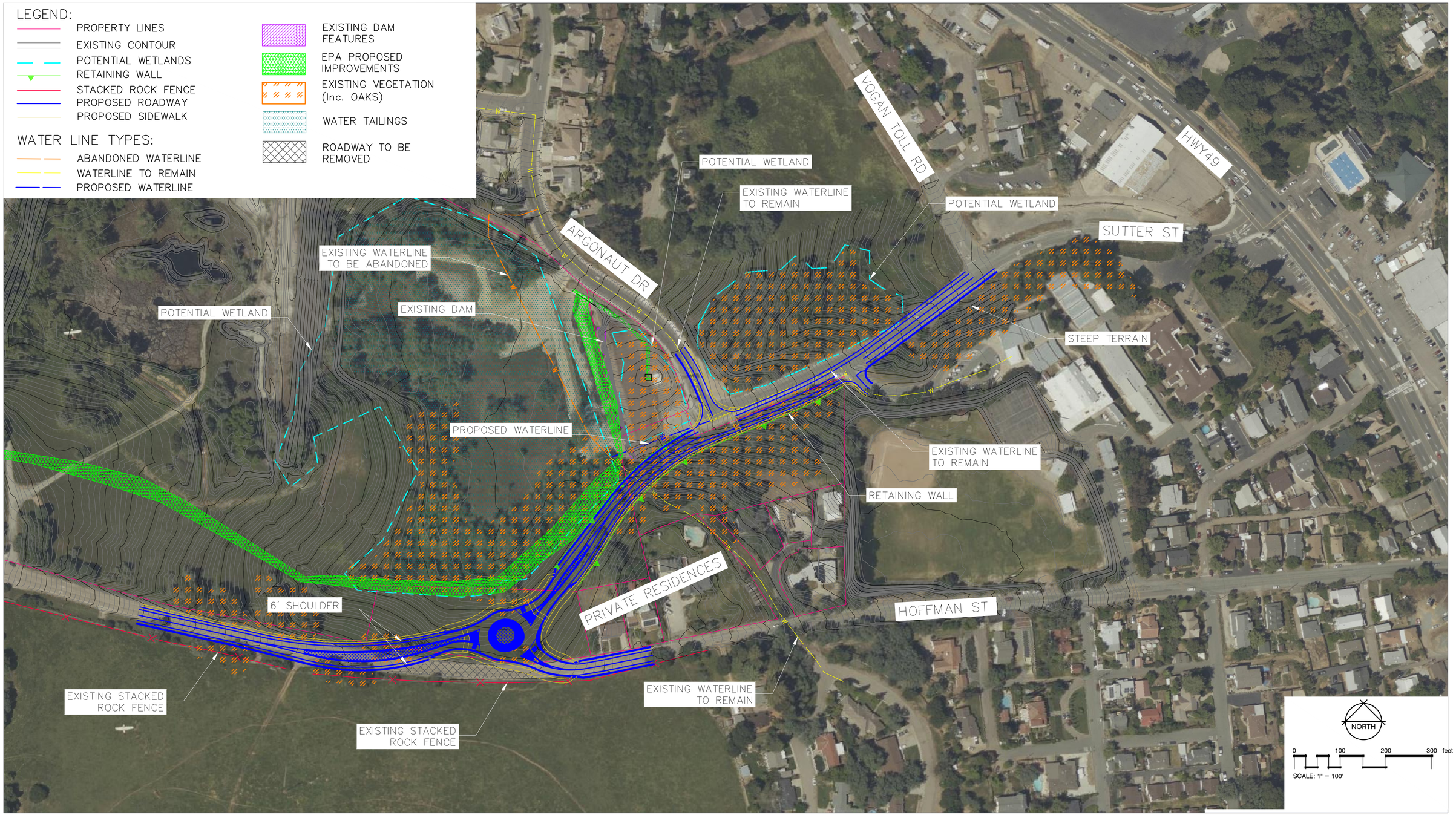
Alternative 3- Roundabout Controlled



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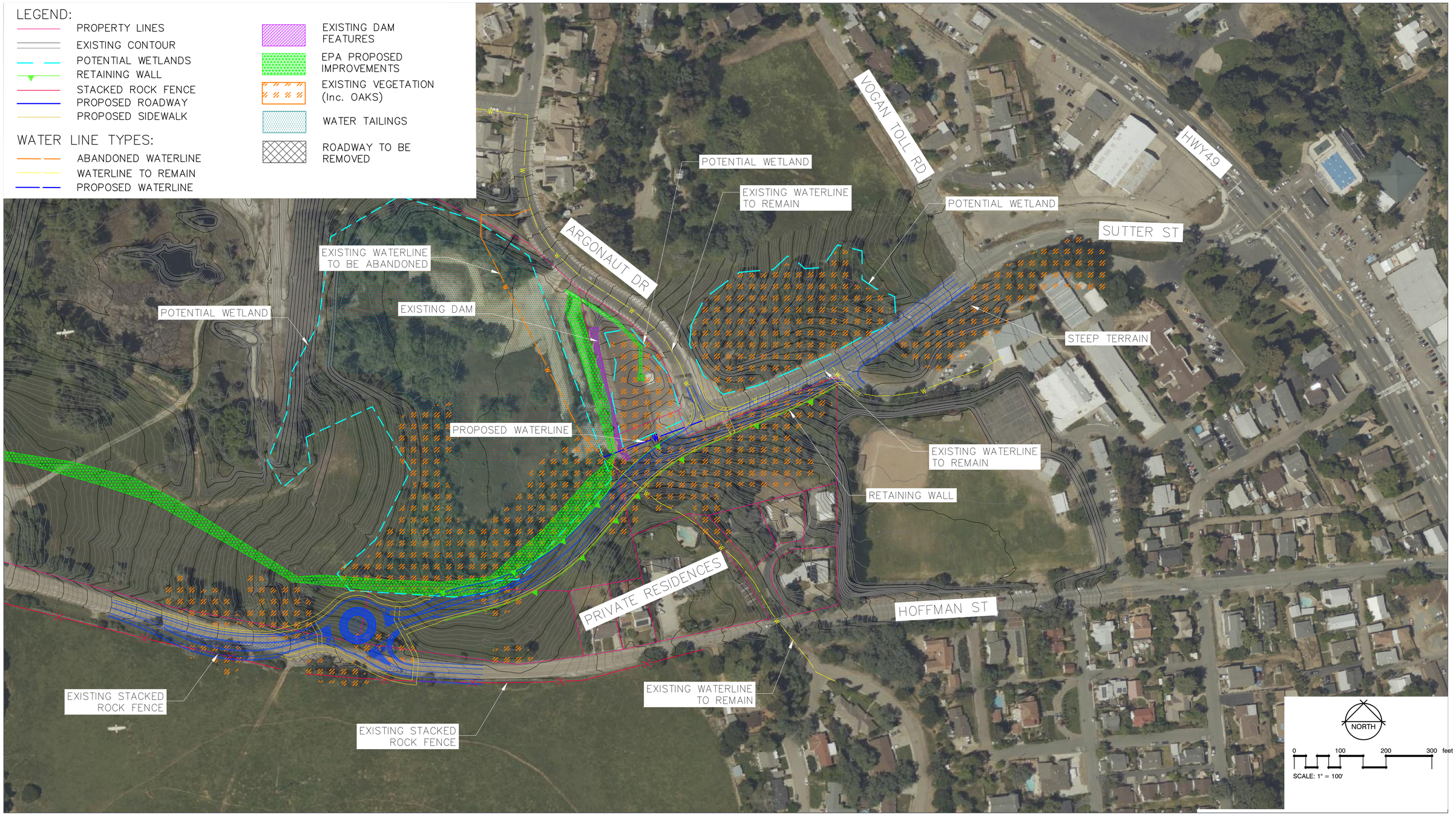
Alternative 3a- Roundabout Controlled (Location 2)



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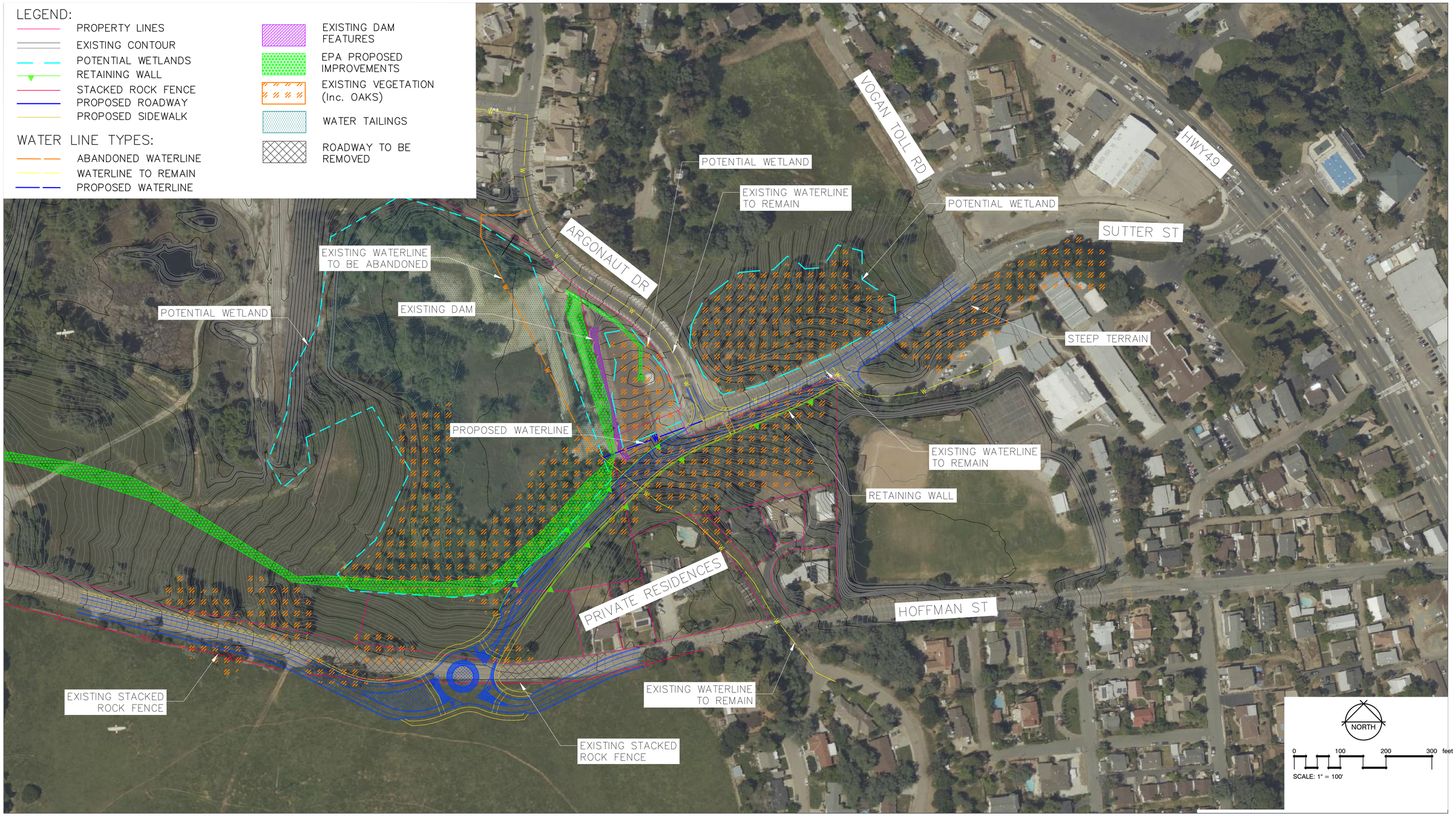
Alternative 3b - Roundabout Controlled (Location 3)



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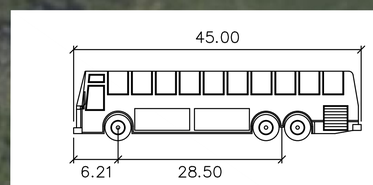
Roundabout Bus Turn Templates

LEGEND:
- RETAINING WALL
- PROPOSED ROADWAY
- PROPOSED SIDEWALK
- VEHICLE PATH



45' BUS

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 42.9

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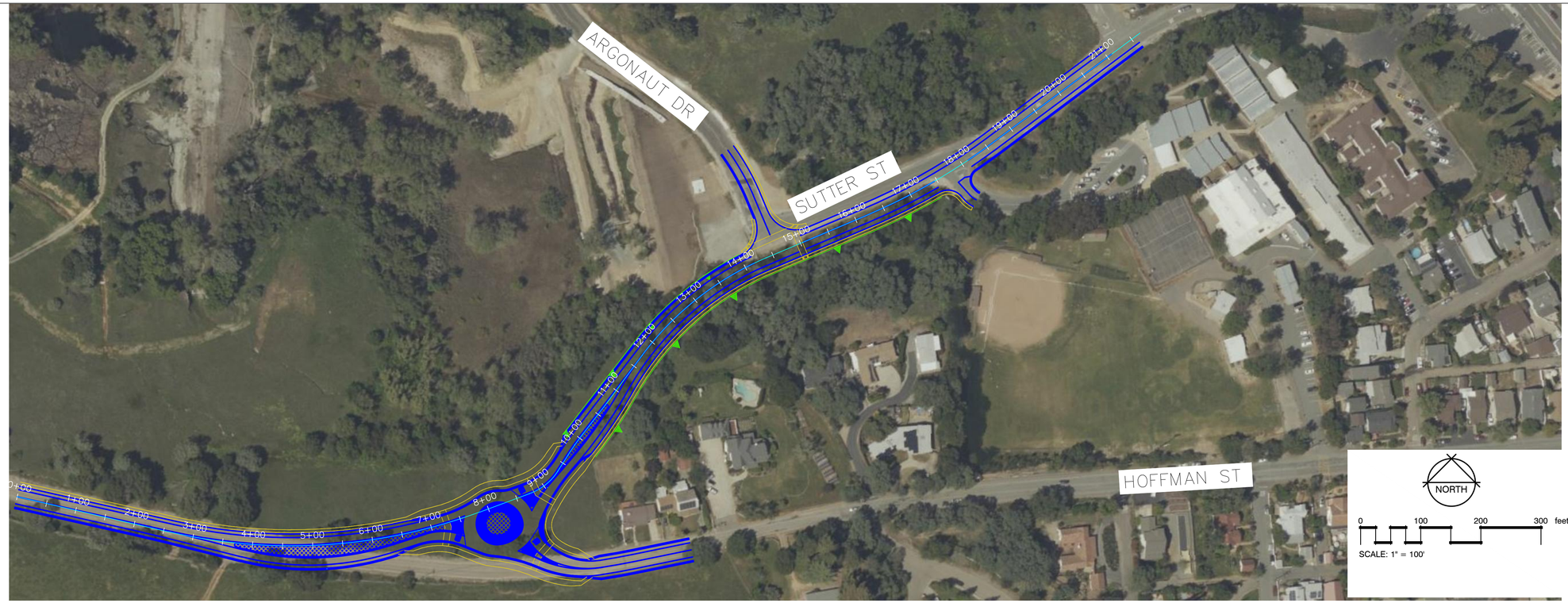
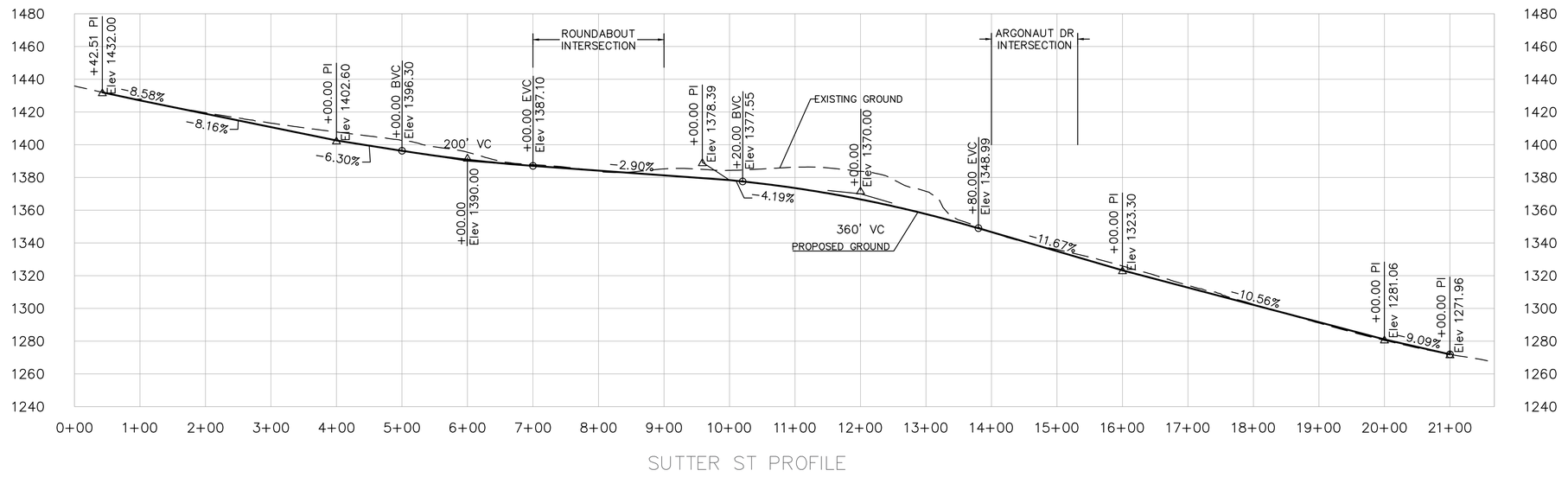
Roundabout Controlled Profile





SUTTER ST PROFILE

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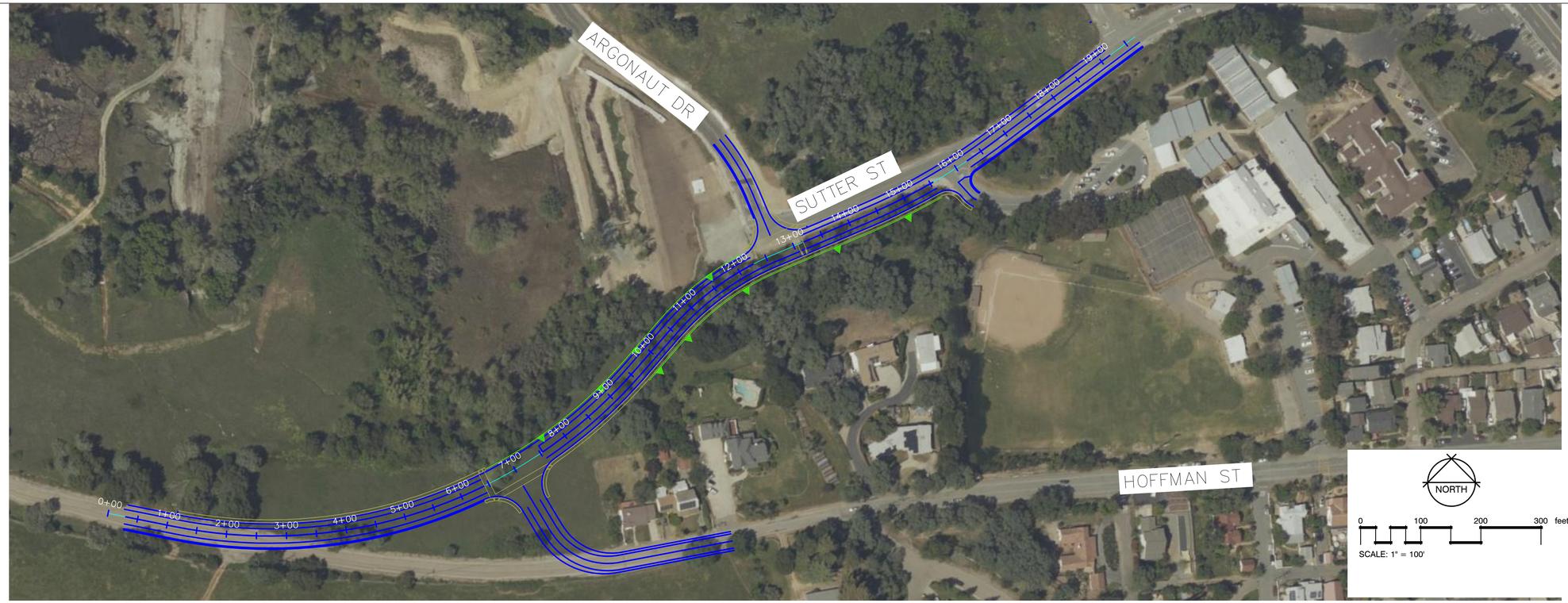
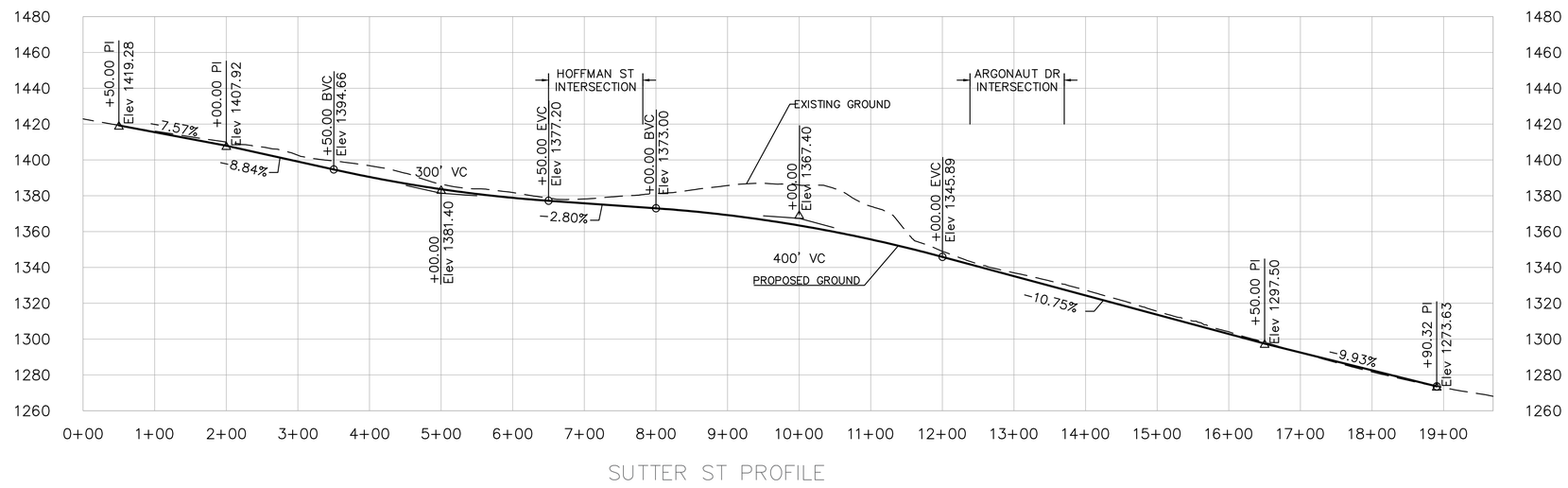
Stop Controlled Profile





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