

Appendix 3.16-3
Sewer Impact Study

TECHNICAL MEMORANDUM

City of San Bruno

SUBJECT: Tanforan Redevelopment Project Sewer Impact Study
PREPARED BY: Gisa Ju, CA PE No. 31823
REVIEWED BY: Chris van Lienden, CA PE No. 75034
DATE: April 24, 2025
REFERENCE: 0011400.09

The City of San Bruno is preparing a Draft Environmental Impact Report (DEIR) to address the potential impacts of the proposed Tanforan Redevelopment Project (Project). The City has requested that Woodard & Curran evaluate the potential sanitary sewer capacity impact of the proposed development using the City's sanitary sewer hydraulic model. The model was originally developed for the City's 2014 Sewer Master Plan and has been updated on a limited basis for various sewer impact studies conducted since that time. This Technical Memorandum (TM) summarizes the results of the evaluation of the impacts of the proposed Tanforan development.

1. PROJECT DESCRIPTION

The Project consists of redevelopment of the former Shops at Tanforan shopping center in the City of San Bruno. The project site (APNs 014-316-080, 300, 310, 330, 360) is bounded by El Camino Real on the west, Huntington Avenue and the San Bruno BART station on the east, Sneath Lane on the north, and Interstate 380 on the south. The Project also includes a vacant parcel north of Sneath Lane at the intersection of Huntington Avenue (APN 041-311-060). The project area is shown on the figures included in **Attachment A** to this TM.

The Project would replace most of the buildings on the former shopping center site with new buildings, although the existing Century theater and Target store would remain. Two alternative land use scenarios have been proposed. Although both scenarios would include retail, office, and residential development, one is focused on research and development and office uses (Scenario A – "R&D Scenario") and the other includes a greater amount of residential and retail development (Scenario B – "Residential Scenario"). **Table 1** presents the proposed land use quantities for the two scenarios. Maps showing the locations of the various buildings and blocks for each scenario are also included in Attachment A.

Table 1: Tanforan Redevelopment Land Use Scenarios

Type of Use	Existing	Scenario A (R&D Scenario)	Scenario B (Residential Scenario)
Retail (sf) ¹	1,050,860	377,320	477,320
Office (sf)	--	1,723,580	1,174,000
Amenity (sf)	--	69,000	55,000
Hotel (rooms)	--	--	170
Residential (DUs)	--	1,014	1,514

sf = square feet; DU = dwelling unit

1. Includes Target and Cinema

The project would include construction of an on-site sewer system to serve the new buildings. The main on-site lines would generally run south to north and connect to the existing City trunk sewer in Sneath Lane at two locations intermediate between El Camino Real and Huntington Avenue. The City's existing 24-inch trunk sewer that currently runs through the shopping center property would be relocated and routed to and along El Camino Real to Sneath Lane. No flow from the redevelopment project would discharge into this relocated trunk sewer.

2. MODEL FLOW UPDATES

To represent the new development in the model, the existing model subcatchment that includes the Tanforan shopping center was subdivided, and new subcatchments (designated as 16B and 16C) were delineated to represent the portions of the Tanforan center tributary to each of the proposed new on-site south-to-north main sewers. The lone parcel APN 014-311-060 in the Tanforan development that is not contiguous to the shopping center site is part of a different subcatchment (15); therefore, its development flows were added to that subcatchment.

To quantify the development and associated flows within the Tanforan Project area, the buildings or blocks to be connected to each of the main on-site sewer lines were identified, along with their associated land use quantities (number of dwelling units and/or square feet of non-residential building floor space), based on information shown on the project plans. Base wastewater flow (BWF) was calculated for each building based on the same unit flow factors used for the City's previous Bayhill Specific Plan sewer impact study. Note that these factors are slightly different than those used in the 2014 Sewer Master Plan but were selected for consistency with the water system analysis that was conducted concurrently for the Bayhill Specific Plan. These unit flow factors are shown in **Table 2**. **Table 3** and **Table 4** list the associated subcatchment, development quantities, and average BWF for each building or block for Scenarios A and B, respectively.

Table 2: Tanforan Redevelopment BWF Unit Flow Factors

Type of Development	Design Unit Flow Factor (average BWF)
Multi-Family Residential	120 gpd/DU
Commercial Office	0.13 gpd/sf
Commercial Retail	0.19 gpd/sf
Hotel	150 gpd/room

gpd = gallons per day; DU = dwelling unit; sf = square feet
BWF = base wastewater flow

Table 3: Tanforan Redevelopment Scenario A (R&D Scenario): BWF by Block

Block/ Building	Sub- catch.	Units	Development Quantity	Average BWF (mgd)
In-line Retail	16C	sf	106,250	0.020
Target	16C	sf	189,570	0.036
Cinema	16C	sf	81,500	0.015
Bldg 1	16B	sf	247,000	0.032
Bldg 2	16B	sf	211,000	0.027
Bldg 3	16C	sf	266,000	0.035
Bldg 4	16B	sf	193,600	0.025
Bldg 5	16B	sf	164,560	0.021
Bldg 6	16B	sf	197,580	0.026
Bldg 7	16C	sf	221,920	0.029
Bldg 8	16C	sf	221,920	0.029
Field House 1	16B	sf	35,000	0.005
Field House 2	16B	SF	20,000	0.003
Field House 3	16C	sf	14,000	0.002
Resi 1	16C	DU	630	0.076
Resi 2	16C	DU	194	0.023
Resi 3	15	DU	190	0.023
Total				0.426

mgd = million gallons per day; DU = dwelling unit; sf = square feet
BWF = base wastewater flow

Table 4: Tanforan Redevelopment Scenario B (Residential Scenario): BWF by Block

Block/ Building	Sub-catch.	Units	Development Quantity	Average BWF (mgd)
In-line Retail	16C	sq ft	106,250	0.020
Target	16C	sq ft	189,570	0.036
Cinema	16C	sq ft	81,500	0.015
Bldg 1	16B	sq ft	247,000	0.032
Bldg 2	16B	sq ft	211,000	0.027
Bldg 3	16C	sq ft	266,000	0.035
Bldg 4	16B	sq ft	258,180	0.034
Bldg 5	16C	sq ft	191,820	0.025
Amenity	16B	sq ft	20,000	0.003
Field House 1	16B	sq ft	35,000	0.005
Grocer 1	16B	sq ft	35,000	0.007
Grocer 2	16C	sq ft	25,000	0.005
Hotel	16B	rooms	170	0.026
Resi 1	16C	DUs	630	0.076
Resi 2	16C	DUs	194	0.023
Resi 3	15	DUs	190	0.023
Resi 4	16B	DUs	296	0.036
Resi 5	16C	DUs	204	0.024
In-line Retail (Resi 4)	16B	sq ft	23,674	0.004
In-line Retail (Resi 5)	16C	sq ft	16,326	0.003
Total				0.458

mgd = million gallons per day; DU = dwelling unit; sf = square feet
BWF = base wastewater flow

In addition to the proposed Tanforan redevelopment, the model also includes projected flows from other recent, ongoing, and planned developments in the City, including the Bayhill Specific Plan area, and proposed 2101 Sneath (Engvall), Crestmoor Residential, and Glenview Highlands developments, as well as the Southline development project in South San Francisco, a portion of which would discharge to the joint use trunk sewer in Tanforan Avenue.

3. MODEL NETWORK UPDATES

For this study, only the portion of the City's sewer system tributary to the 24-inch Tanforan Avenue trunk sewer (see **Figure 1**) was included in the model network used for the sewer impact analysis (the remainder of the City's system discharges to a 36-inch trunk sewer in 7th Avenue that connects to South San Francisco's system at Shaw Road on the north side of I-380). Flow from both the Tanforan and 7th Avenue trunk sewers are conveyed through South San Francisco to South San Francisco's Shaw Road Pump Station. In addition to including the other proposed developments noted above, the model network was updated to reflect the potential sewer improvements that the City is considering in the Earl Avenue/Glenview Avenue area, which are needed to relieve this portion of the system where wet weather sewer overflows have occurred. These improvements would increase the peak flows that are conveyed downstream, eventually ending up in the trunk sewer in Sneath Lane.

An existing 24-inch trunk sewer runs north through the Tanforan development site from manhole 895, located just south of the Tanforan site adjacent to the I-380 interchange, to existing manhole 1350 on the 24-inch sewer in Sneath Lane, located approximately 300 feet east of El Camino Real (see **Figure 1A**). The existing 24-inch trunk sewer in Sneath Lane continues east to Huntington Avenue and then follows Tanforan Avenue to the point where it discharges to South San Francisco's line going to the Shaw Road Pump Station. As noted previously, the development plans would abandon the existing sewer through the development site and route a new sewer west along the southern boundary of the site, starting at its upstream connection point (assumed to be at City manhole 895), and then north along El Camino Real to Sneath Lane. The existing trunk sewer in Sneath Lane from El Camino Real to Seabiscuit Avenue (City manhole 1349) would also be replaced as part of the project. The developer proposes to install a 30-inch high-density polyethylene (HDPE) pipe (DR17, with a pipe inside diameter of 26.3 inches). Note that per City's master planning criteria, a pipe friction factor n of 0.013 is used for all pipe materials, based on the assumption that pipe roughness (e.g., due to buildup of a slime layer on the pipe wall) could increase over time.

A model network scenario was created to represent the relocated trunk sewer based on the utility site plan (dated 7/17/24) and sewer profile (dated 9/25/24) provided by the developer's engineer (also included in Attachment A). In order to match the elevations in the Master Plan model, the elevations shown on the developer's plans were adjusted down by 2.72 feet based on the average of the differences in elevation between the existing model and the Project plans at the upstream and downstream connection points of the proposed 30-inch sewer.

Also, as noted previously, the projected flows from the proposed Tanforan redevelopment will not enter this relocated sewer. Rather, the on-site sewer system will convey the development flows north to Sneath Lane, where the on-site sewers would discharge to the Sneath Lane trunk sewer at City manholes 1349 (Subcatchment 16B) and 1347 (Subcatchment 16C).

Figure 2 shows the modeled trunk sewers in the vicinity of the Tanforan Project area, including the proposed relocated trunk sewer.

Figure 1: Modeled Sewer Network

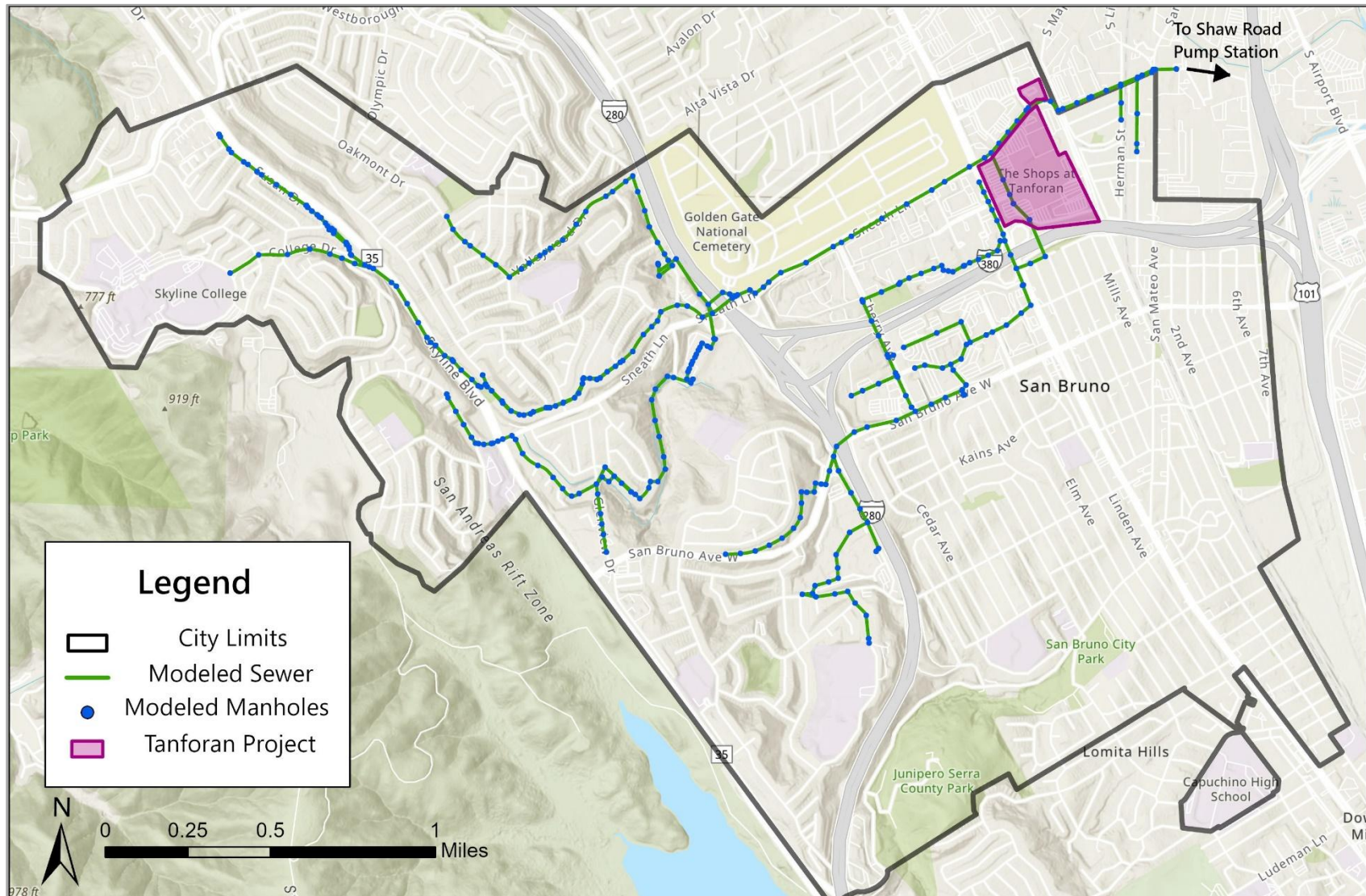
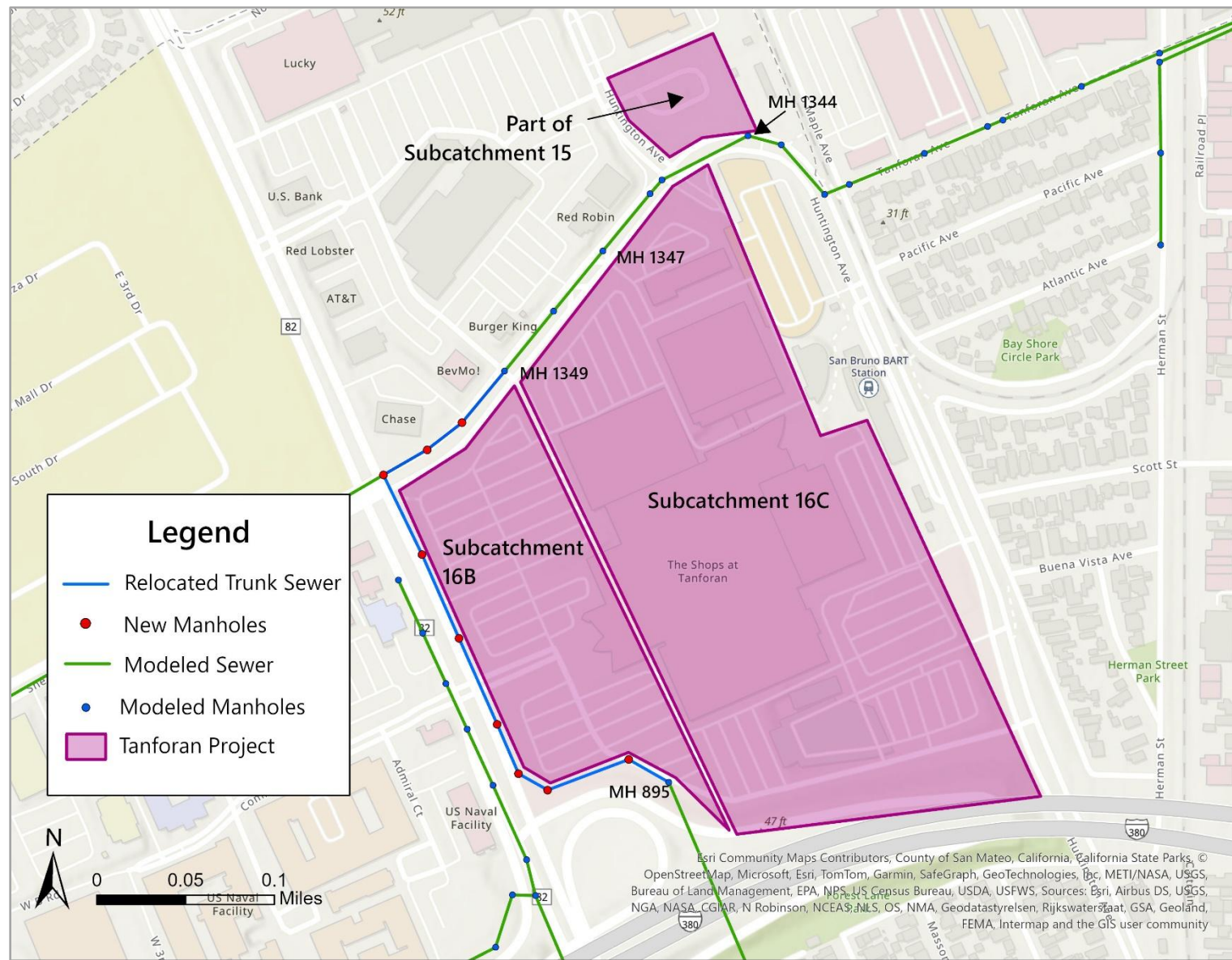


Figure 1A: Existing Sewers in Vicinity of Tanforan Development Site



Figure 2: Modeled Sewer Network in Project Vicinity



4. MODEL RESULTS

System capacity was evaluated based on the ability of the sanitary sewer system to convey peak wet weather flow (PWWF) under design storm conditions. The analysis for this study used the same BWF diurnal curves for residential and non-residential flows, as well as the same rainfall-dependent inflow and infiltration (RDI/I) for this area applied to the 10-year return period design event, as used in the 2014 Sewer Master Plan.

The model was run for future PWWF conditions with and without the proposed Tanforan redevelopment. The model results were evaluated to identify any predicted surcharge under design PWWF in the relocated 30-inch HDPE sewer and in the sewers downstream of the Tanforan development. A “base scenario” was also run, assuming the existing trunk sewer configuration through the Tanforan site with the existing Tanforan flows (based on 2018 water use data) plus the other future developments and Earl/Glenview system improvements described above.

The model profiles in **Figure 3** and **Figure 4** show the results for the base scenario and for the Tanforan Project Residential Scenario with the relocated 30-inch HDPE sewer, respectively. (The profile for the R&D Scenario would not be significantly different.) The profiles extend from Sneath Lane at Huntington Avenue (manhole 1344) upstream to El Camino Real at Bayhill Drive (manhole 748). (A model profile legend is included in **Attachment B**.)

Under the base scenario, the 24-inch trunk sewer in Sneath Lane would be “throttled” (pipe is surcharged because predicted peak flow exceeds full pipe capacity), with backwater surcharge extending upstream in the existing 24-inch line that runs through the Tanforan site. At the upstream end (manhole 895), the sewer would be surcharged by about 1 foot with about 4 feet of freeboard, considered acceptable based on the City’s Master Plan criteria for defining a capacity deficiency in an *existing* sewer.

Under the Tanforan Project Residential Scenario with relocated 30-inch HDPE sewer, the throttle surcharge in the 24-inch trunk in Sneath Lane would be slightly more severe due to the increased flows from the development. However, the new 30-inch HDPE pipe would be surcharged for its entire length, with a predicted freeboard of about 3 feet at the upstream end. This would violate the City’s Master Plan criteria for design of *new* sewers, which specify that pipes should be able to convey the future design storm PWWF with no (or minimal) surcharge. Note that in this case, the predicted surcharge is due primarily to backwater from the existing 24-inch sewer in Sneath Lane. Extending the new 30-inch HDPE sewer downstream to Huntington Avenue (see profile in **Figure 5**) would eliminate the surcharged conditions in the 30-inch HDPE line and therefore comply with the City’s design criteria.

Based on the model results, the total PWWF from the City conveyed in the Tanforan Avenue trunk sewer to the Shaw Road Pump Station would increase from 13.8 mgd under the base scenario to about 14.5 mgd with the additional Tanforan development flows (Residential Scenario) and sewer improvements (14.4 mgd under the R&D Scenario).

5. CONCLUSIONS AND RECOMMENDATIONS

The proposed Tanforan development would increase average BWF flow in the City's sewer system by up to about 0.27 mgd (under the Residential Scenario) and increase design storm PWWF by about 0.7 mgd. However, the proposed relocation of the existing 24-inch trunk sewer that currently runs through the site to a longer alignment along El Camino Real (even with a larger 30-inch HPDE pipe) would result in a more severe backwater condition with a predicted freeboard of about 3 feet under PWWF at the upstream connection point of the new sewer. This condition is primarily due to the capacity limitation of the existing 24-inch sewer in Sneath Lane, to which the relocated sewer would connect. To alleviate the predicted backwater, it is recommended that the new 30-inch sewer (currently proposed to end at MH 1349) be extended further downstream along Sneath Lane to MH 1344 at Huntington Avenue, as shown in **Figure 6**.

Table 5 summarizes the sewer improvements needed to accommodate the Tanforan development.

Table 5: Proposed Sewer Improvements

Existing Facility	Location	Proposed Action
24-inch trunk sewer through Tanforan Center	Through existing Tanforan Center from north of I-380 interchange (manhole 895) to Sneath Lane (manhole 1349)	Divert flow at manhole 895 and construct 1,868 feet of new 30-inch HDPE sewer along south boundary of Tanforan Center west to El Camino Real, along El Camino Real north to Sneath Lane, and along Sneath Lane east to Seabiscuit Lane (connect to existing manhole 1349). ¹
24-inch trunk sewer in Sneath Lane	Sneath Lane from Seabiscuit Lane (manhole 1349) to Huntington Avenue (manhole 1344)	Replace existing 24-inch pipe with 1,022 feet of 30-inch HDPE pipe.

1. Project as proposed by developer.

Figure 3: Model Profile of Existing 24" Sneath Lane Sewer and Existing 24" Sewer through Tanforan Center under Design Storm PWWF (Base Scenario)

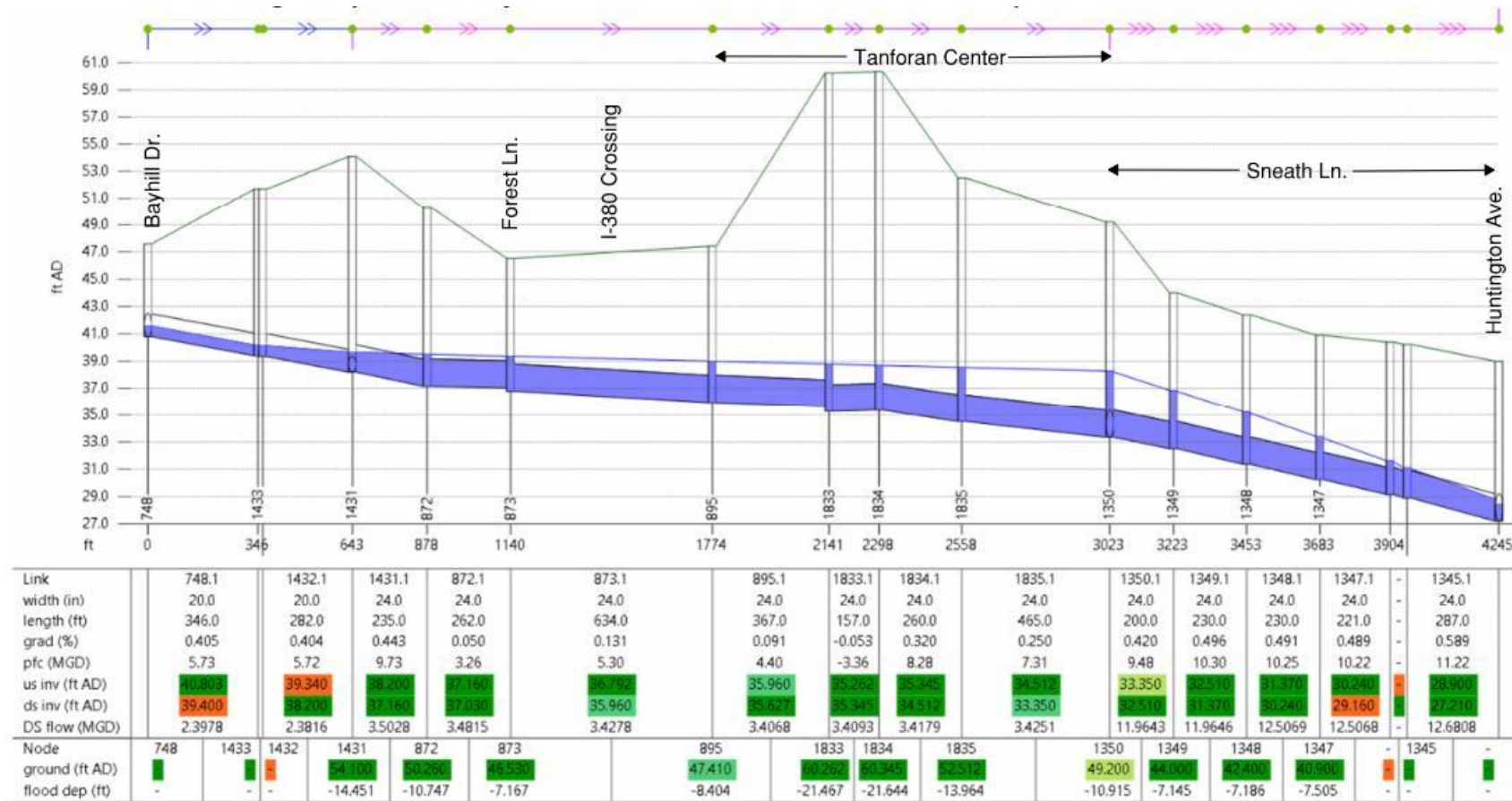


Figure 4: Model Profile of Existing 24" Sneath Lane Sewer and Proposed 30" HDPE Tanforan Project Sewer under Design Storm PWWF (Tanforan Development Scenario)

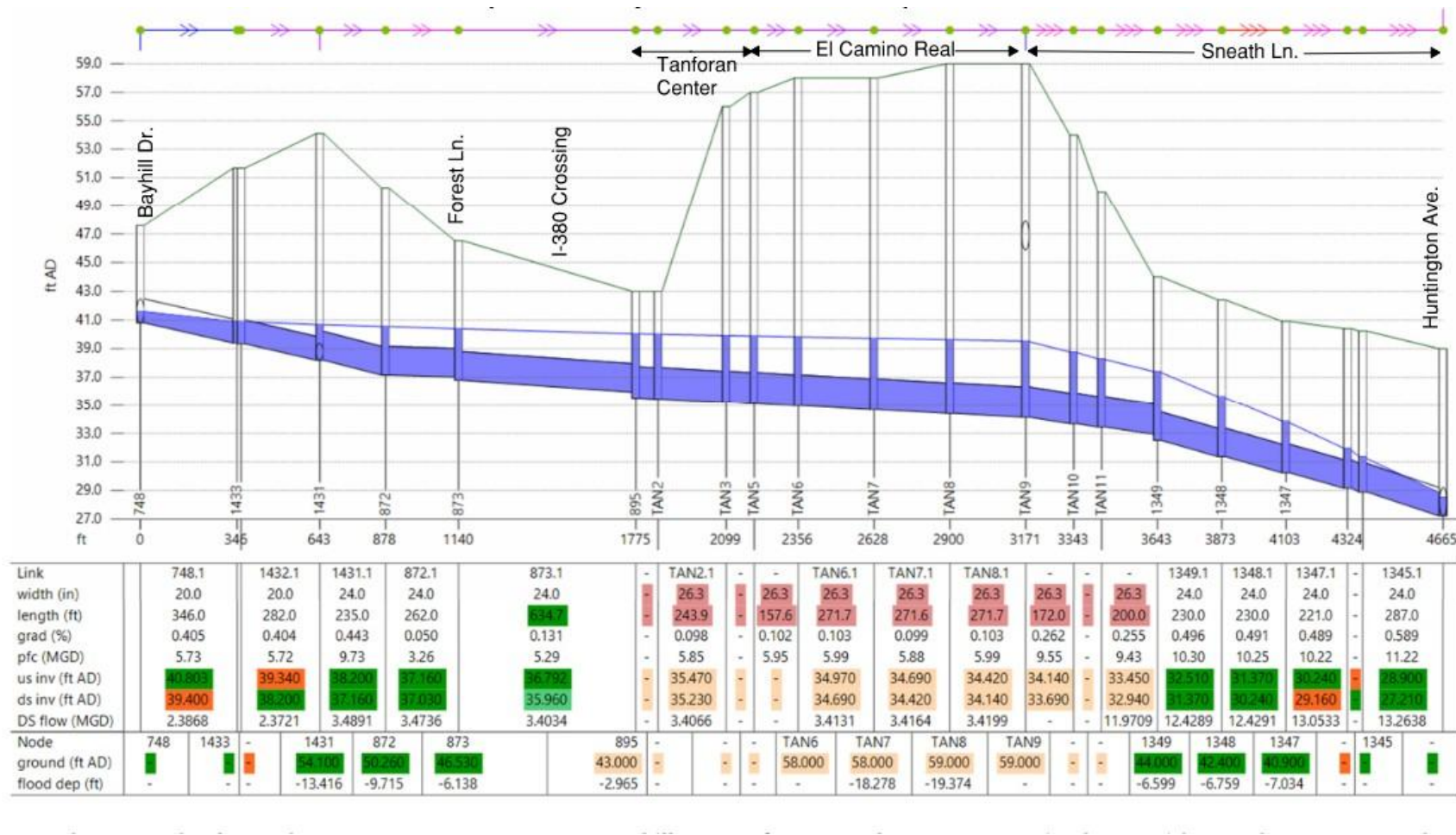


Figure 5: Model Profile of Existing 24" Sneath Lane Sewer Upsized to 30" HDPE and Proposed 30-inch HDPE Tanforan Project Sewer under Design Storm PWWF (Tanforan Development Scenario)

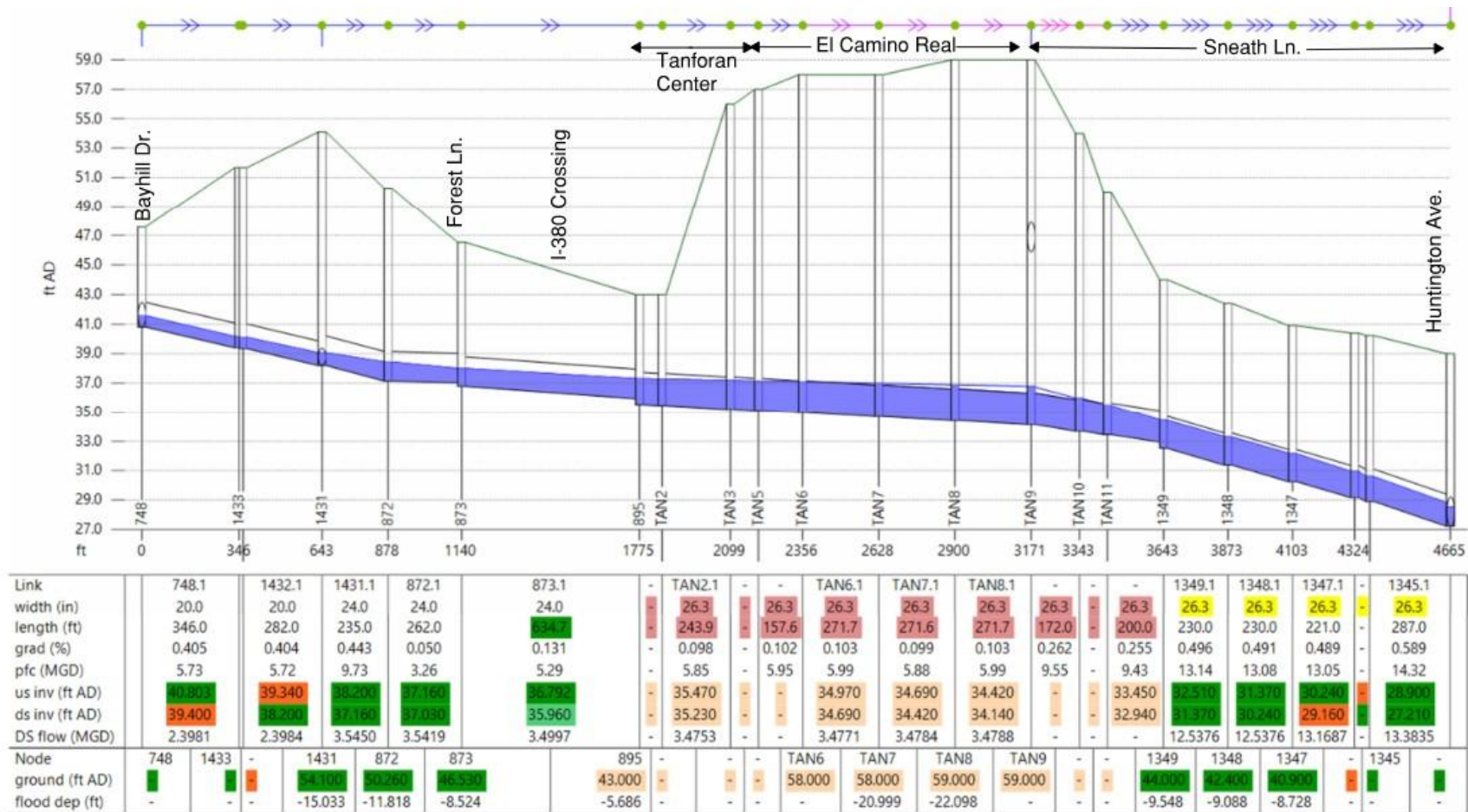
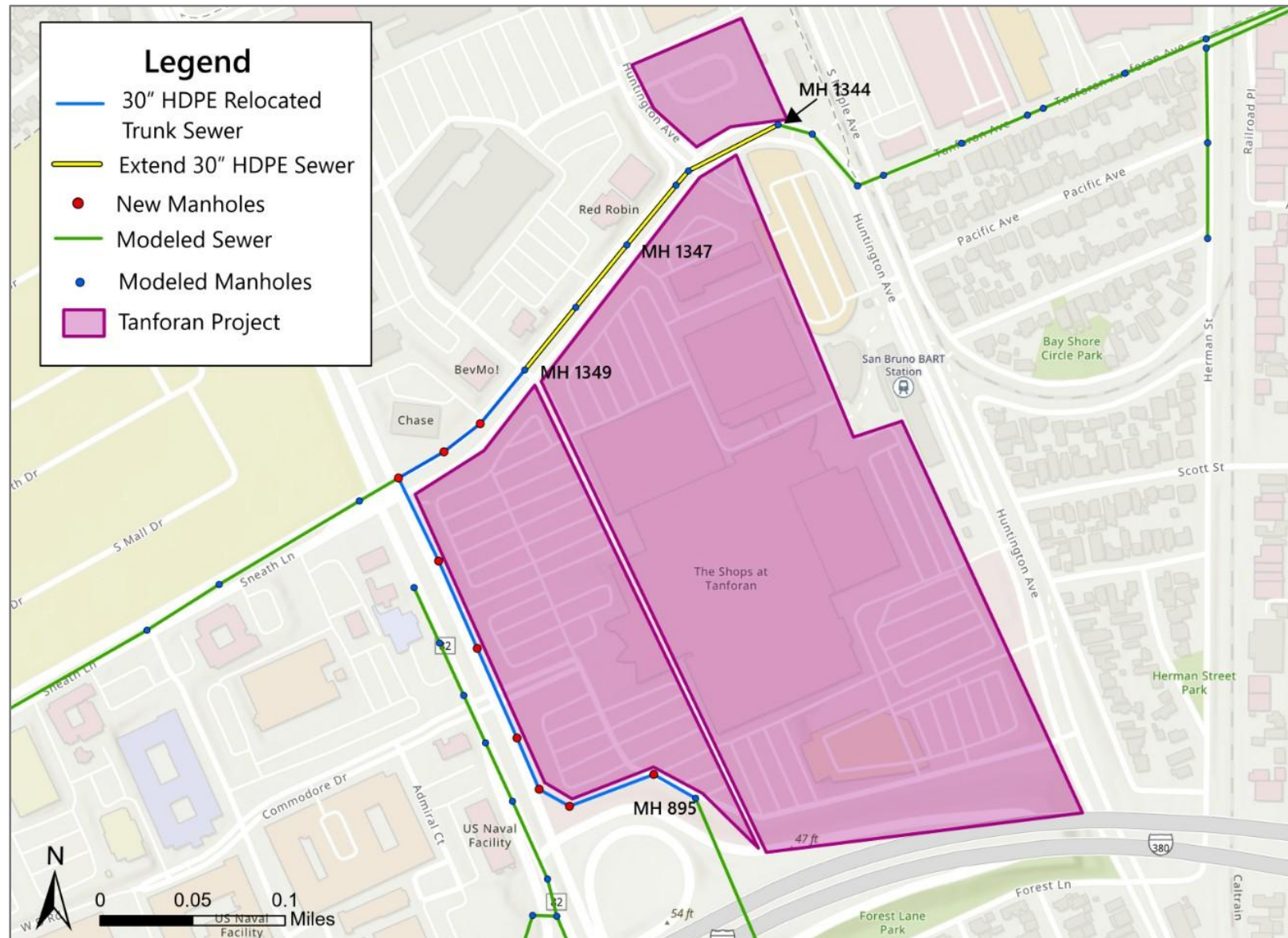


Figure 6: Recommended Off-Site Sewer Improvements for Tanforan Development



Attachment A: Tanforan Redevelopment Project Information



Figure 1
Project Location

TANFORAN MASTER PLAN | MAX LAB A

OFFICE / R&D	FAR	AREA (GSF)*
BLDG 1	0.13	247,000
BLDG 2	0.11	211,000
BLDG 3	0.14	266,000
BLDG 4	0.10	193,600
BLDG 5	0.09	164,560
BLDG 6	0.10	197,580
BLDG 7	0.12	221,920
BLDG 8	0.12	221,920
FIELD HOUSE 1 (AMENITY)	0.02	35,000
FIELD HOUSE 2 (AMENITY)	0.01	20,000
FIELD HOUSE 3 (AMENITY)	0.01	14,000
TOTAL	0.94	1,792,580

*NOTE: AREA SUBTRACTS 16% OF TOP FLOOR AREA OF EACH BLDG. FOR MEP

RETAIL	FAR	AREA (GSF)
TARGET	0.10	189,571
CINEMA	0.04	81,500
IN-LINE	0.06	106,250
TOTAL	0.20	377,321

RESIDENTIAL	UNIT MIX	DU	DU	AC	DU/AC	FAR	AREA (GSF)**
RESI 1			630	3.13	201	0.33	640,000
	STUDIO (25%)	158					
	1-BED (50%)	315					
	2-BED+ (25%)	158					
RESI 2			194	1.76	110	0.12	221,000
	STUDIO (25%)	49					
	1-BED (50%)	97					
	2-BED+ (25%)	49					
RESI 3			190	1.42	134	0.10	189,000
	STUDIO (25%)	48					
	1-BED (50%)	95					
	2-BED+ (25%)	48					
TOTAL		1,014	6.32	0.55	1,050,000		

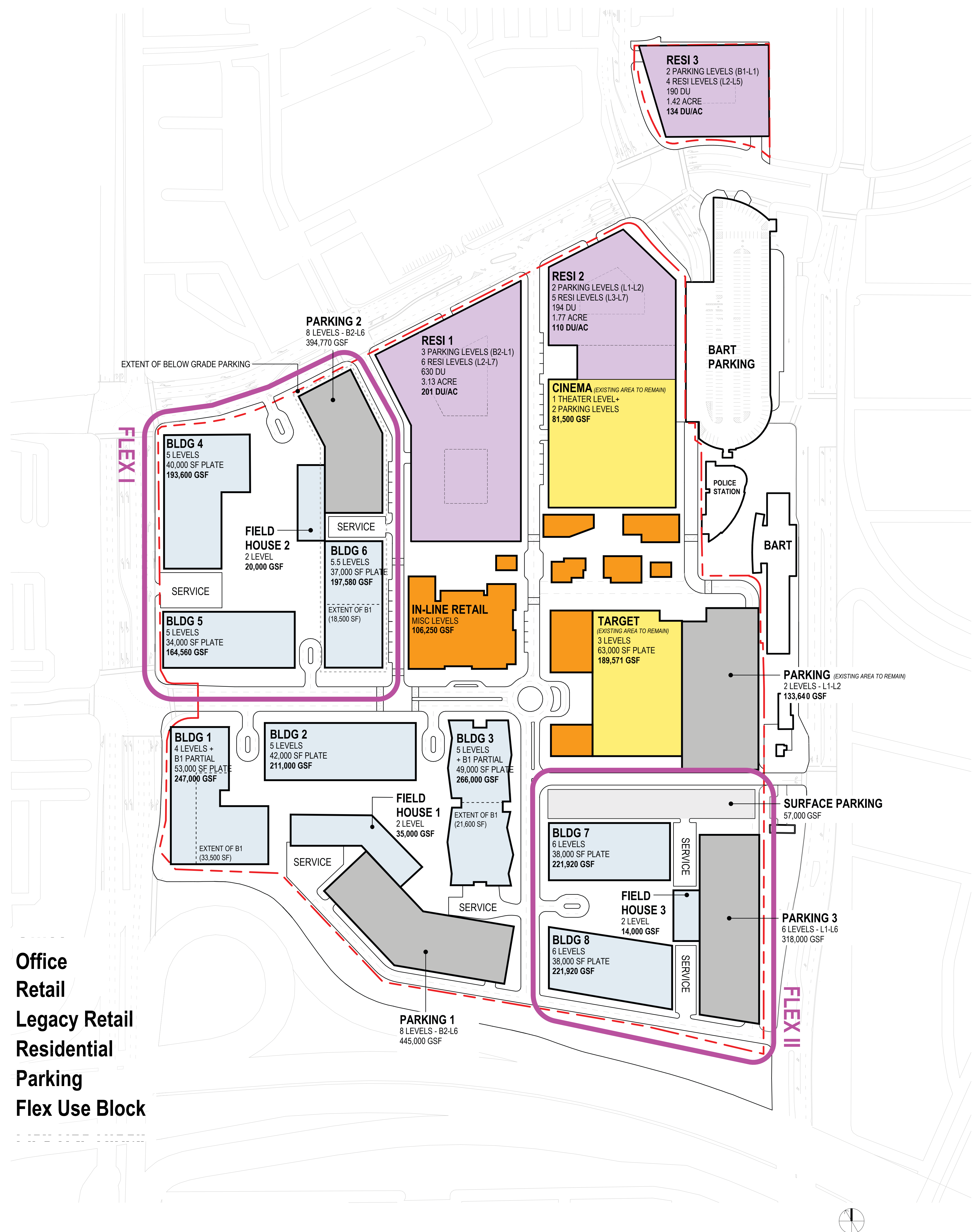
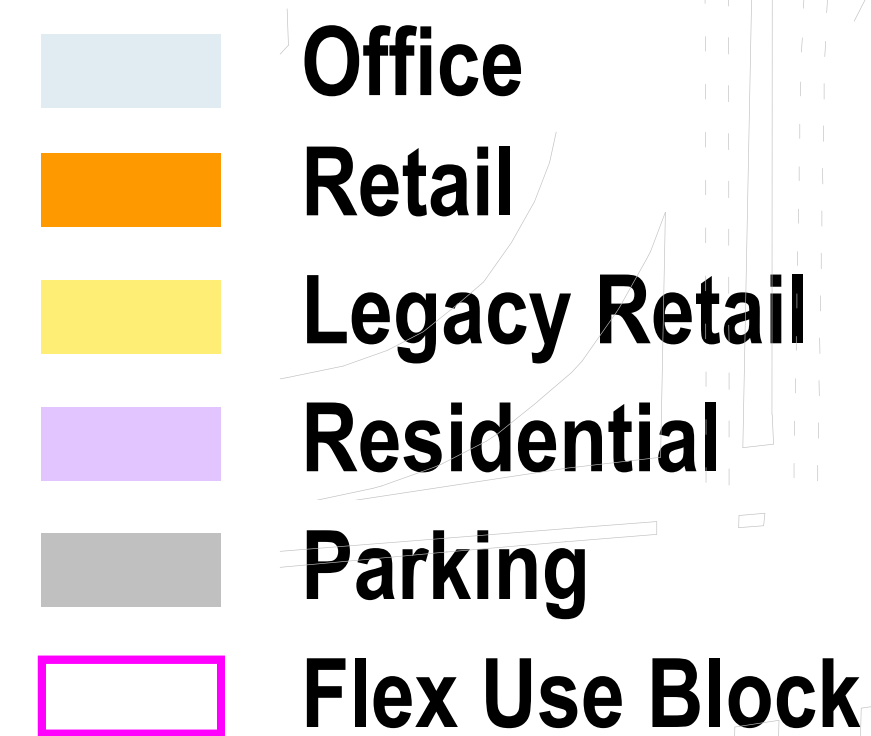
	<i>FAR</i>	<i>AREA (GSF)**</i>
TOTAL PROJECT	1.68	3,219,901

BIKE STALLS & LOCATION
per Table 12.100-3 San Bruno Muni Code

LONG Class I	SHORT Class II	LOCATION (ANTICIPATED)
<u>1 per 10k sf</u>	<u>1 per 20k sf</u>	
25	12	SW PARCEL
21	11	SW PARCEL
27	13	SW PARCEL
19	10	FLEX I
16	8	FLEX I
20	10	FLEX I
22	11	FLEX II
22	11	FLEX II
4	2	SW PARCEL
2	1	FLEX I
1	1	FLEX II
179	90	

<i>1 per 12k sf</i>	<i>1 per 5k sf</i>	
16	38	TARGET
7	16	CINEMA
9	21	RETAIL DIST.
31	75	

<i>1 per 4 DU</i>	<i>1 per 15 DU</i>	
158	42	<i>RESI 1</i>
49	13	<i>RESI 2</i>
48	13	<i>RESI 3</i>
254	68	



TANFORAN MASTER PLAN | MAX MIXED USE

OFFICE / R&D

	FAR	AREA (GSF)**
BLDG 1	0.13	247,000
BLDG 2	0.11	211,000
BLDG 3	0.14	266,000
BLDG 4	0.13	258,180
BLDG 5	0.10	191,820
FIELD HOUSE 1 (AMENITY)	0.02	35,000
AMENITY	0.01	20,000
TOTAL	0.64	1,229,000

*NOTE: AREA SUBTRACTS 16% OF TOP FLOOR AREA OF EACH BLDG. FOR MEP

RETAIL

	FAR	AREA (GSF)
TARGET	0.10	189,571
CINEMA	0.04	81,500
IN-LINE	0.06	106,250
FLEX AREA RETAIL	0.05	100,000
GROCER		35,000
GROCER		25,000
RESI 3 IN-LINE		23,674
RESI 4 IN-LINE		16,326
TOTAL	0.25	477,321

RESIDENTIAL

	UNIT MIX	DU	DU	AC	DU/AC	FAR	AREA (GSF)**
RESI 1			630	3.13	201	0.33	640,000
	STUDIO (25%)	158					
	1-BED (50%)	315					
	2-BED+ (25%)	158					
RESI 2			194	1.76	110	0.12	221,000
	STUDIO (25%)	49					
	1-BED (50%)	97					
	2-BED+ (25%)	49					
RESI 3			190	1.42	134	0.10	189,000
	STUDIO (25%)	48					
	1-BED (50%)	95					
	2-BED+ (25%)	48					
RESI 4			296	1.28	231	0.14	275,000
	STUDIO (25%)	74					
	1-BED (50%)	148					
	2-BED+ (25%)	74					
RESI 5			204	1.03	198	0.12	225,000
	STUDIO (25%)	51					
	1-BED (50%)	102					
	2-BED+ (25%)	51					
TOTAL		1,514		8.63		0.81	1,550,000

HOTEL

	KEYS	FAR	AREA (GSF)
TOTAL	170	0.07	125,000

TOTAL PROJECT

FAR	AREA (GSF)**
1.77	3,381,321

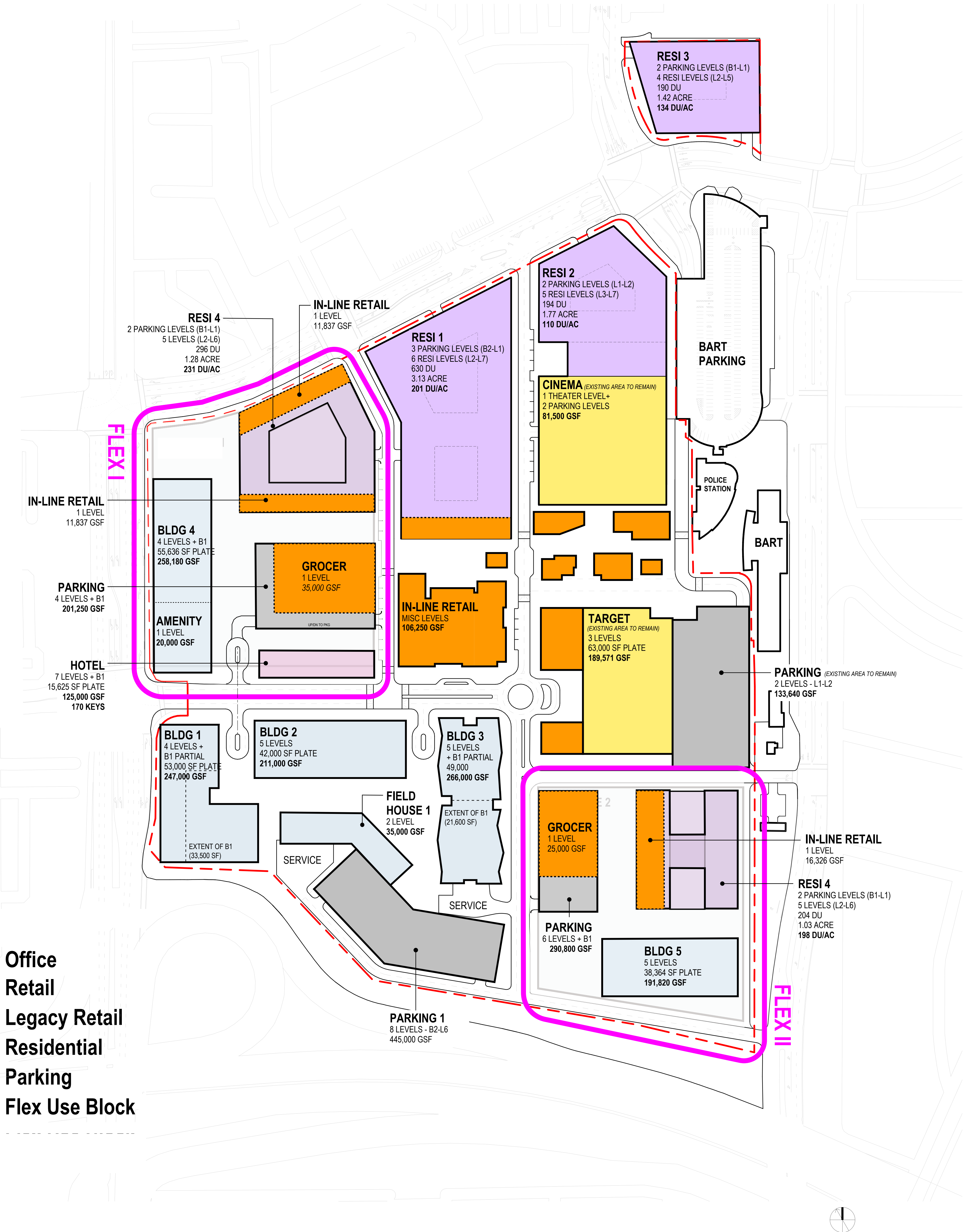
BIKE STALLS & LOCATION
per Table 12.100-3 San Bruno Muni Code

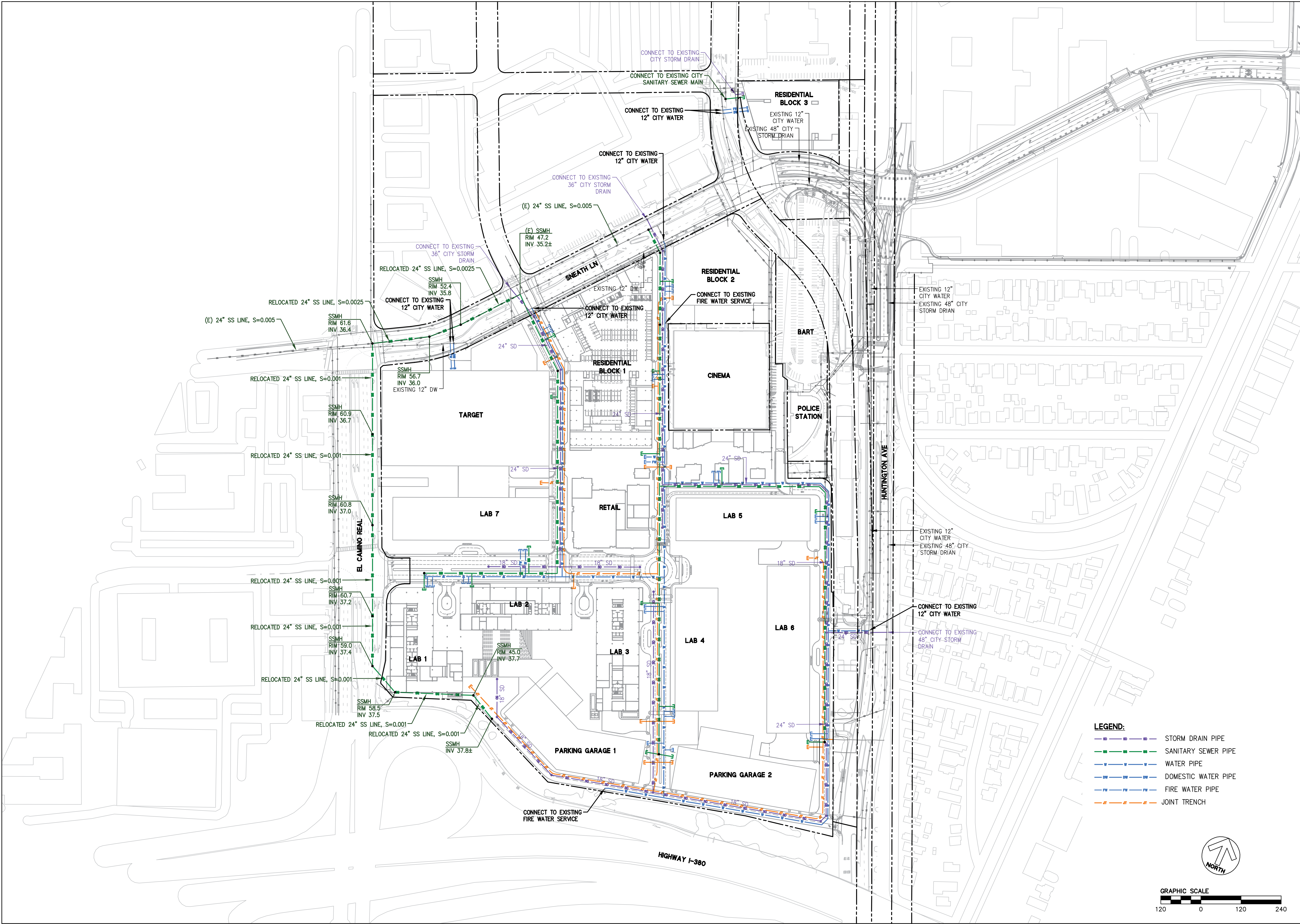
LONG Class I	SHORT Class II	LOCATION (ANTICIPATED)
1 per 10k sf	1 per 20k sf	
25	12	SW PARCEL
21	11	SW PARCEL
27	13	SW PARCEL
26	13	FLEX I
19	10	FLEX II
4	2	SW PARCEL
2	1	FLEX I
123	61	

1 per 12k sf	1 per 5k sf	
16	38	TARGET
7	16	CINEMA
9	21	
8	20	
2	5	FLEX I
2	5	FLEX II
1	3	FLEX I
1	3	FLEX II
40	95	

1 per 4 DU	1 per 15 DU	
158	42	RESI 1
49	13	RESI 2
48	13	RESI 3
74	20	FLEX I
51	14	FLEX II
379	101	

- Office
- Retail
- Legacy Retail
- Residential
- Parking
- Flex Use Block





TANFORAN REDEVELOPMENT
CONCEPT DESIGN
UTILITY PLAN

BKF
255 SHORELINE DRIVE
SUITE 200
REDWOOD CITY, CA 94065
(650) 482-6300
www.bkf.com

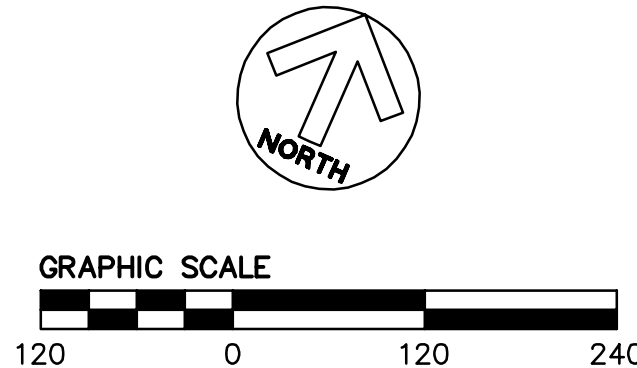
CALIFORNIA

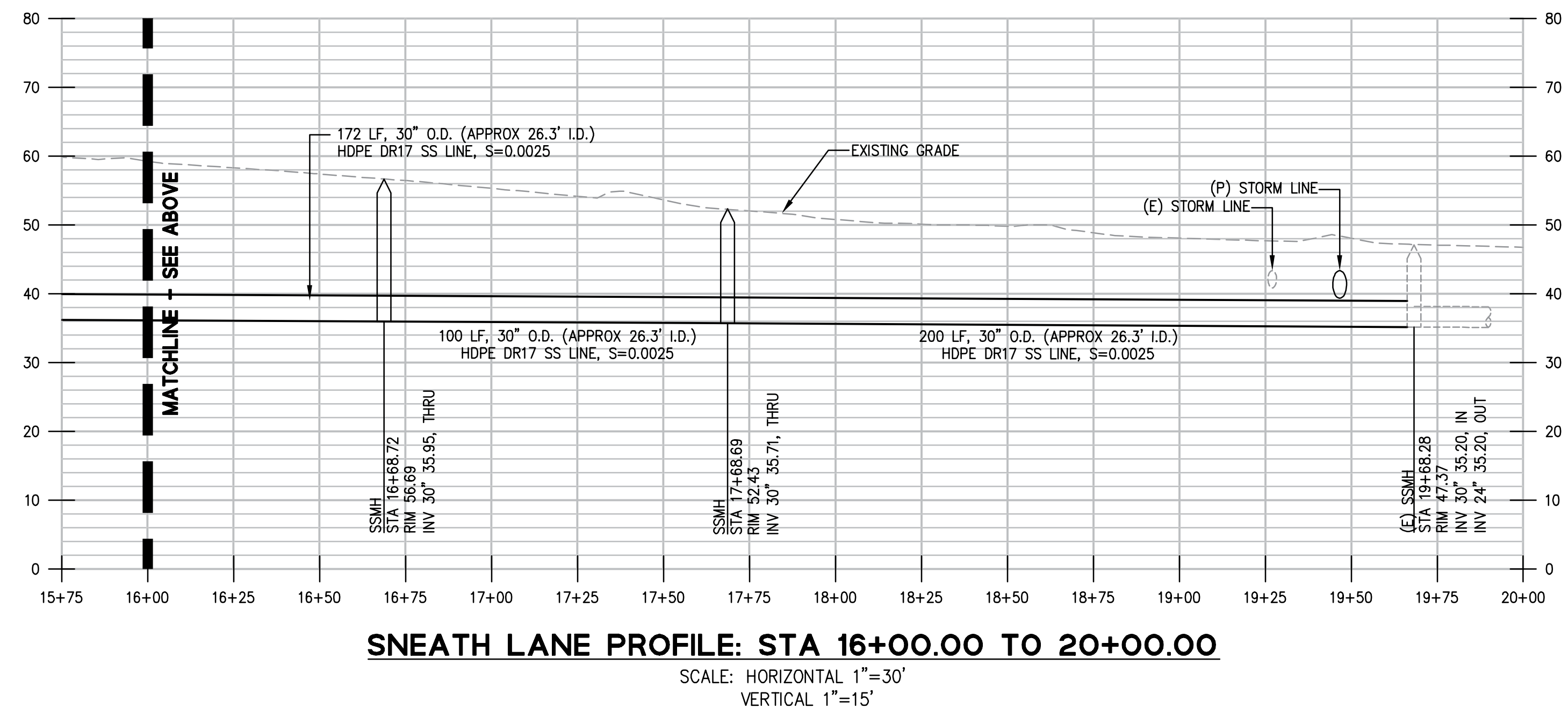
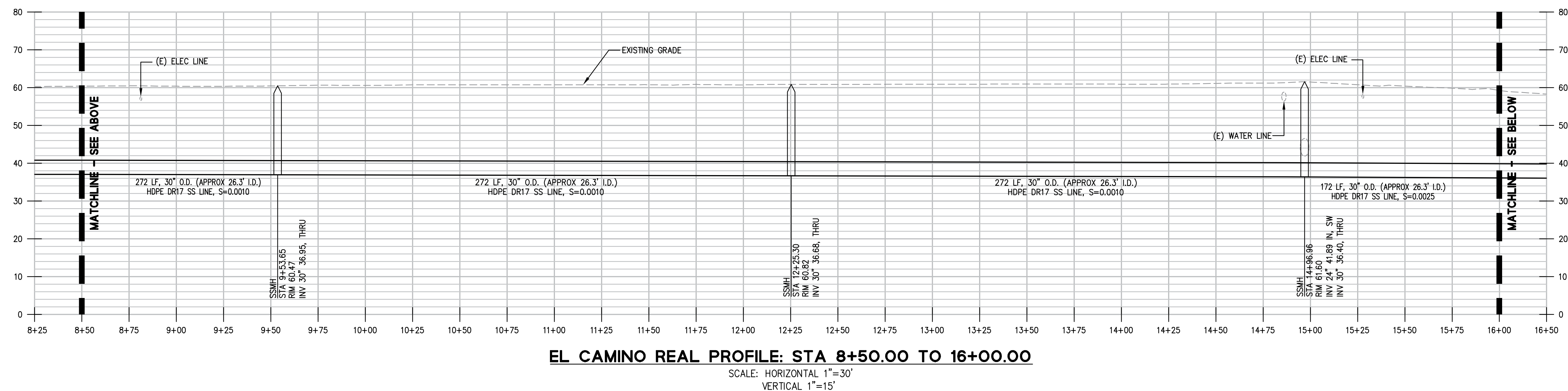
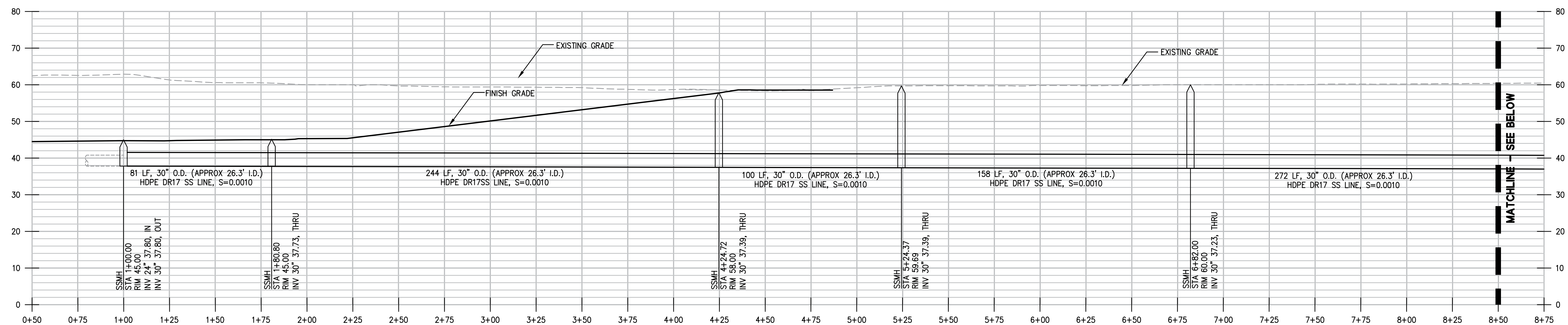
SAN MATEO COUNTY

SAN BRUNO

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Design	JP		
Drawn	JP		
Approved	JT		
Job No	2021695		
Drawing Number:		C3.0	

- LEGEND:
- SD STORM DRAIN PIPE
 - SS SANITARY SEWER PIPE
 - W WATER PIPE
 - DW DOMESTIC WATER PIPE
 - FW FIRE WATER PIPE
 - JT JOINT TRENCH





No.	Date	7/20/2024	revisions
Scale	1" = 120'		
Design	J.P		
Drawn	J.P		
Approved	J.T		
Job No	2021695		

Attachment B: Model Profile Legend

