

APPENDIX D.5: MILLBRAE STATION REPORT AND EXHIBITS

Part 1 of 2

**CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTABILITY ANALYSIS
APPENDIX D.5 MILLBRAE STATION REPORT AND EXHIBITS**

March 2019

APPENDIX D.5 MILLBRAE STATION REPORT AND EXHIBITS

Index

1	CONSTRUCTABILITY PHASES APPROACH MILLBRAE STATION.....	1
1.1	Phase 1	3
1.2	Phase 2	3
1.3	Phase 3	4
1.4	Phase 4	4
1.5	Phase 5	4
1.6	Phase 6	5
1.7	Phase 7	6
1.8	Phase 8	7
1.9	Phase 9	7
1.10	Phase 10.....	8
1.11	Final Phase	9

EXHIBITS

Plan

Scheme

Plan and profile scheme

1 CONSTRUCTABILITY PHASES APPROACH MILLBRAE STATION.

Millbrae is an at-grade Caltrain and BART station located in the suburban area of Millbrae. This station is used for BART at east and for Caltrain at west. Caltrain and BART have a common platform.



Figure 1. Millbrae Station current situation

In the future situation, BART station will not have any modifications but the Caltrain one will be reformed to be adapted to high speed traffic.

These modifications consist in defining four tracks and two platforms to segregate Caltrain and HSR railway traffics. The construction of two new tracks will be carried out on the western side of the current corridor.

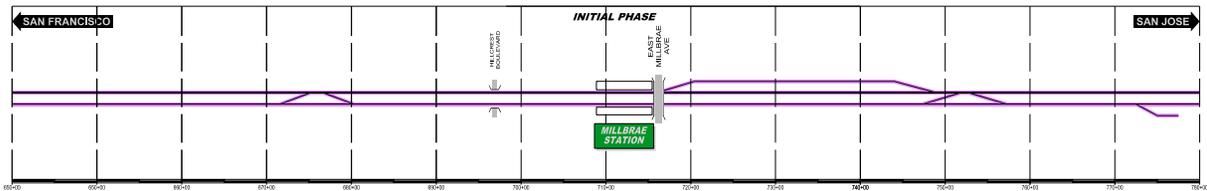
Regarding the platforms configuration, the current platform on the left side will be used and intended for Caltrain, the platform of the right side will be extended in width and length, becoming a central platform to be used by the services of HSR and it will be necessary the construction of a new lateral platform for the new built track and that will be intended for Caltrain.



Figure 2. Millbrae Station future situation

Currently the alignment in Millbrae station area has two straight segments and a curve between them. In both straight segments there are two sets of crossovers. In the track to San Francisco there is a siding track with a platform just before Millbrae station.

In the south, near to Broadway Street there is a shunting track on the right of the track towards San Jose.



In the future, HSR and Caltrain will share the same corridor that Caltrain uses actually.

Using different platforms for HSR and Caltrain implies defining two new siding tracks. An element that difficult the works is the position of platforms.

The Caltrain platform to San Jose will be transformed into a HSR platform for both directions.

It is necessary to build a new Caltrain platform towards San Jose.

The result of this will be that HSR tracks will become the main tracks.



1.1 Phase 1

This phase involves the adaptation of OCS poles and gantries between stations 727+00 and 753+00. The objective of this phase is to modify poles and gantries that can be used during later construction stages.



During this stage, there are no restrictions on railway traffic, so the capacity of the line will not be affected.

The OCS adaptation works will be carried out during:

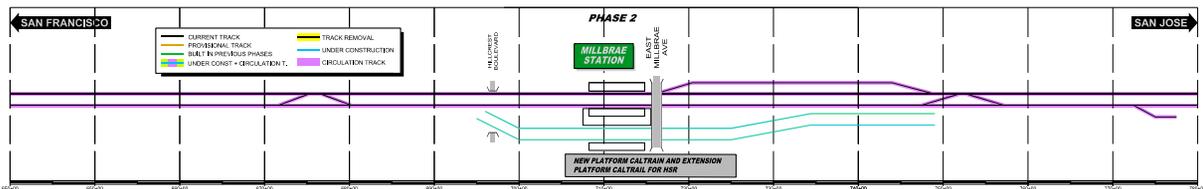
- Day-time periods: Activities taking place inside the safety area.
- Night-time periods: Activities taking place outside the safety area or areas where a power outage is needed.

1.2 Phase 2

During phase 2, the construction of the new tracks along the west side of the corridor will be made. The construction will be between stations 696+00 and 749+00.

The tasks to be performed are:

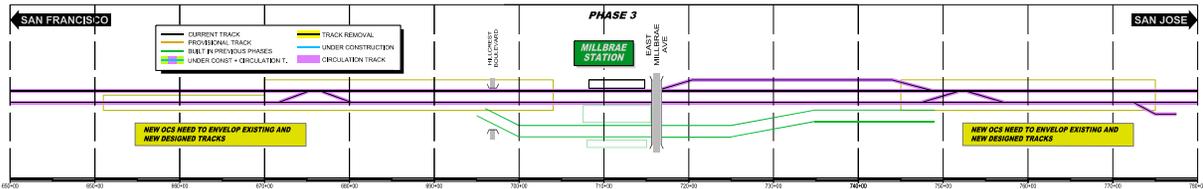
- Construction of the new tracks between stations 696+00 and 749+00.
- Construction of the new lateral platform and the extension of the current platform for southbound Caltrain service.



During this stage, there are no restrictions on railway traffic, so the capacity of the line will not be affected. No night-time activities are foreseen. The platforms in use are the eastern platform and the east half of the central platform.

1.3 Phase 3

In this phase electrification facilities are extended in order to make them compatible with current and future tracks, to maintain railway traffic during construction. In the figure below, the shaded area represents the affected area.



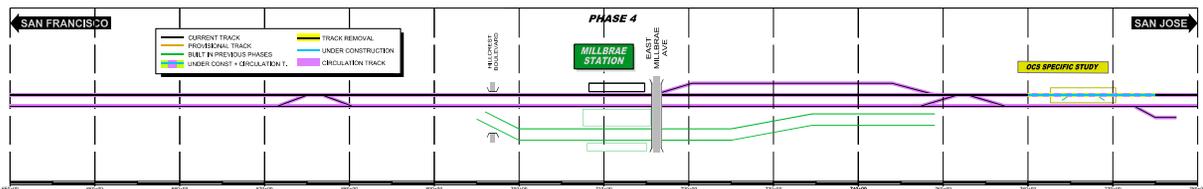
The OCS adaptation works will be carried out during:

- Day-time periods: Activities taking place inside the safety area.
- Night-time periods: Activities taking place outside the safety area or areas where a power outage is needed.

During this stage, there are no restrictions on railway traffic, so the capacity of the line will not be affected. The platforms in use are the eastern platform and the east half of central platform.

1.4 Phase 4

In this phase, the renewal of the east track (northbound) between stations 760+00 and 775+00 and the assembly of new turnouts is carried out.

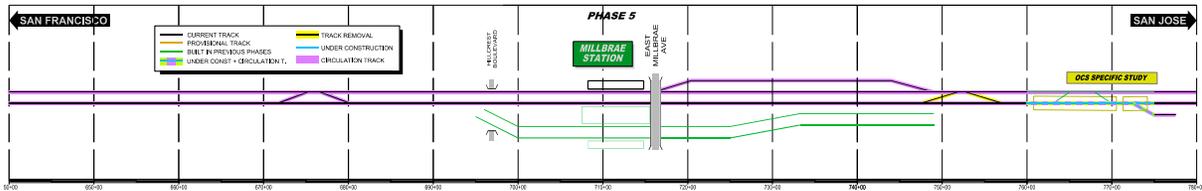


As the construction involves tracks in use, this phase will be carried out during night-time periods. The facilities in use are the east (northbound) track and the east half of the central platform. In this phase, some restrictions in the traffic speed will be established for northbound service, between stations 760+00 and 775+00.

1.5 Phase 5

This phase involves the renewal and the lateral displacement of the west (southbound) track between stations 760+00 and 775+00 and the assembly of new turnouts. These turnouts complete the entire crossovers initiated in phase 4. In addition, the following turnout construction activities will also occur:

- The disassembly of existing turnouts: including disassembly of the turnout placed on the access to the shunting track and assembly of this turnout in its permanent position.



All of the activities during this stage will be carried out in night-time periods.

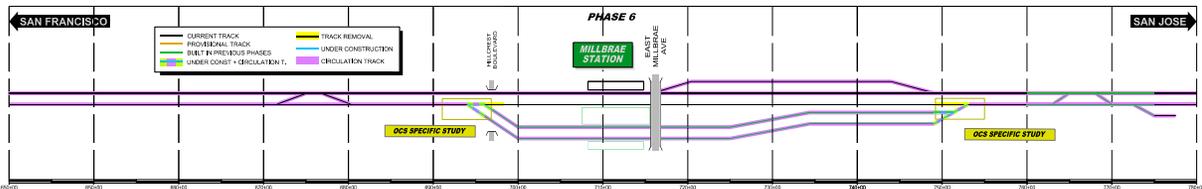
The tracks in use are the east (northbound) track and the east half of the central platform.

In this phase, some restrictions in the traffic speed will be established for northbound service between stations 760+00 and 775+00.

1.6 Phase 6

In this phase, the following activities will be carried out:

- Removal of the existing west (southbound) track in the areas necessary to enter two new turnouts.
- Connection of the central and outer west tracks to the existing west (southbound) track by using a new turnout placed at each end.



The current west track (southbound) between stations 694+00 and 751+00 will have no railway traffic. For this reason, the southbound service will run on the two, new outer-west, tracks once the turnouts have been assembled.

The assembly of turnouts and connections with the current track will be carried out during a single period of night traffic cut. This will require speed limit restrictions over the turnouts while the leveling and the tamping of the track takes place.

Each direction of traffic will have its own track, so the capacity of the line will not be affected.

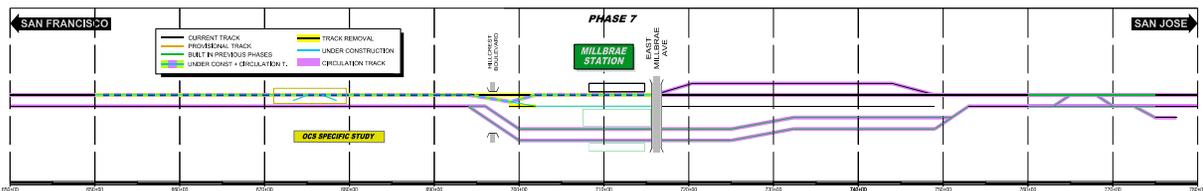
The platforms in use will be the east one for northbound traffic and the west side of the central and the outer west one for southbound traffic.

As described, the sections where assembly of turnouts and connection with the current track will be made will take place in a night-time period traffic cut. There will be no railway traffic restrictions and each direction of traffic will have its own track, so railway line capacity will not be affected.

1.7 Phase 7

In this phase, the following activities will be carried out:

- Renewal and lateral displacement of the east track (northbound) between the stations 650+00 and 715+00.
- Renewal and lateral displacement of the west track (southbound) between the stations 702+00 and 715+00.
- Assembly of new semi-turnouts that will replace the current ones located at station 675+00.
- Assembly of the turnout to connect the east siding track to the main track on the northbound side.
- Disassembly of the left track between stations 695+00 and 701+00



The work to be done in this phase will be entirely carried out at night.

The critical item of this phase is the implementation of the turnout on the east siding track. This will be executed in one-night time period, which the removal of a track section, the lateral displacement of the adjacent tracks and the assembly of a turnout must be completed.

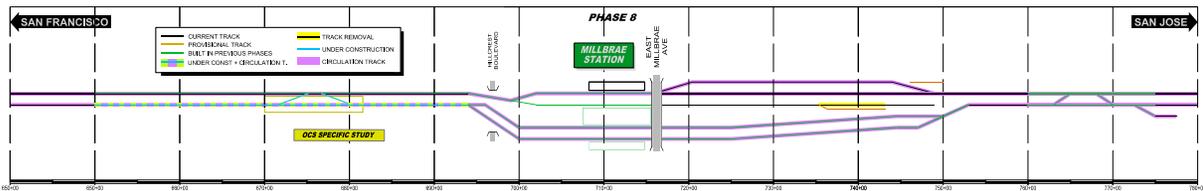
The platforms in use will be the east one for northbound traffic and the central one and the outer west one for the southbound traffic.

This phase will involve a series of restrictions on the traffic speed. These restrictions take place in the northbound direction between stations 650+00 and 715+00.

1.8 Phase 8

In this phase, the following activities will be carried out:

- Renewal and lateral displacement of the west track (southbound) between stations 650+00 and 695+00.
- Assembly of new semi-turnouts that will replace the current banalization of the station.
- Construction of a temporary track section, executed by displacing laterally the existing southbound track between stations 735+00 and 743+00.
- Construction of a temporary track section located on to the east of the main left track between stations 746+00 and 750+00.



All the construction in this phase will be done during the night-time periods, except for the execution of temporary tracks that can be carried out during daytime provided that safety distances to tracks with traffic are guaranteed.

The platforms in use will be the east one for northbound traffic and the west side of the central one and the outer west one for the southbound traffic.

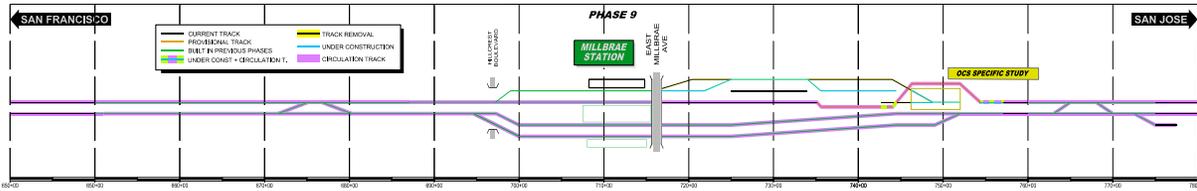
In this phase, the railway traffic runs with speed restrictions in the southbound direction between stations 650+00 and 695+00.

1.9 Phase 9

The activities that will be carried out during this phase are the following:

- Construction of the remaining temporary track sections and connection with those executed in the previous phase, so that a continuous service is available between the stations 735+00 and 754+00
- Lateral displacement of the east track between stations 734+00 and 750+00 so that a continuous axis is achieved between the provisional track and the definitive track.
- Construction of the east siding-track from the end of the station to the main track, except for a section needed for the crossing of the temporary track.

- Assembly of the connection turnout of the east siding-track with the main track on the south side.
- Removal of the existing east siding-track in the unusable sections.



All the construction in this phase will be done during the night-time periods, except for the execution of the west siding-track and the assembly of the track turnout that can be done during daytime period, provided that safety distances to tracks with traffic are guaranteed.

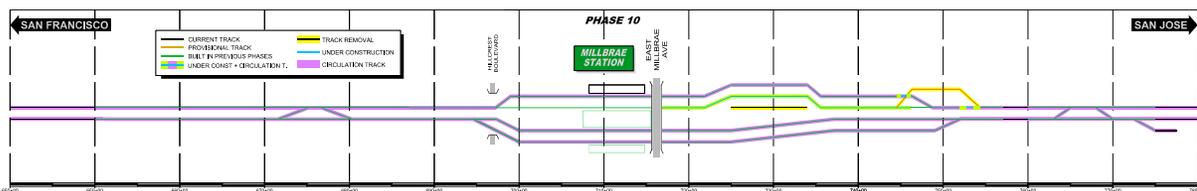
The platforms in use are the central one for both directions and the west one for circulations in the southbound direction.

The traffic in the southbound direction is free of restrictions on circulation. The traffic in the northbound direction has speed limits required for the execution of the connections between the temporary and the existing tracks and the constrained geometry of the temporary. Both limitations are estimated to be 20 mph.

1.10 Phase 10

During phase 10, the following activities will be carried out:

- Connection of the sections of the east siding-track built in previous phases with the final east track.
- Removal of the temporary track.
- Construction of the northbound main track from the end of the station to the turnout assembled in the previous phase.
- Removal of the unusable southbound main track section.



All the construction in this phase will be done during daytime periods except for the connection of the west siding track with the main track, provided that safety distances to the tracks with current traffic are guaranteed.

The platforms in use are the central one for northbound traffic and the lateral ones for their respective directions.

The railway traffic in the southbound direction is free of restrictions.

Railway traffic in the northbound direction have speed limitations associated to the execution of connections between the tracks constructed in previous phases. This limitation is set at 20 mph.

1.11 Final Phase

Once the construction is finished, the railway traffic returns to normal operation. Specific to Millbrae station, there will be separation between the Caltrain and HSR traffic. The outer tracks and platforms for Caltrain service and the internal tracks and central platform HSR service.

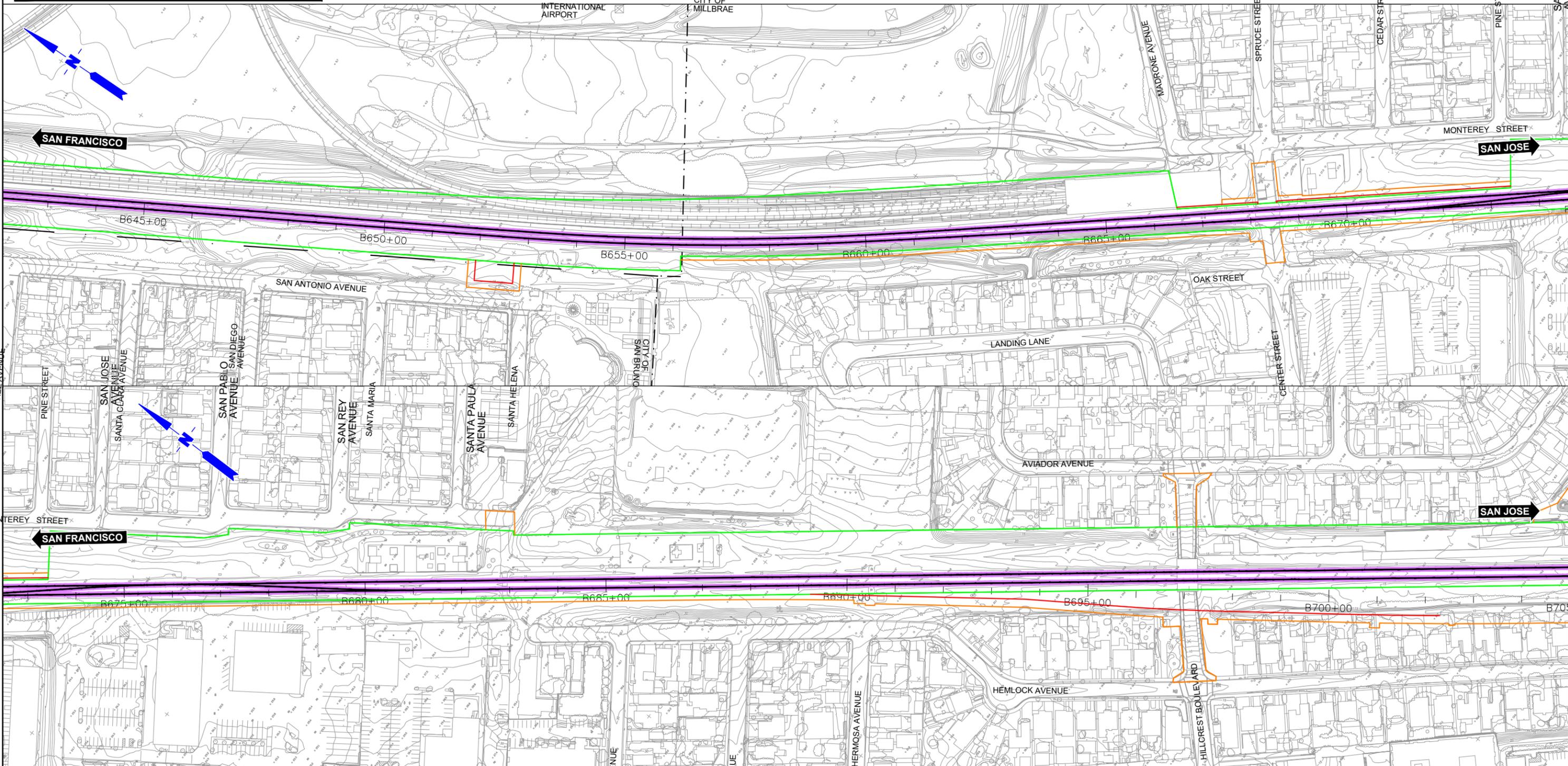
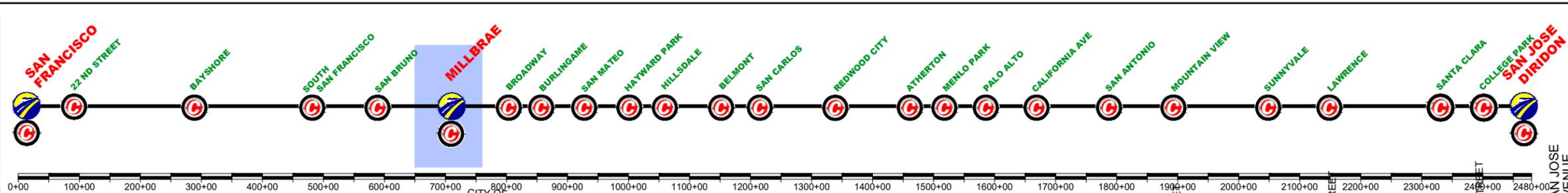
After the station construction is complete, the corridor will return to typical two track configuration shared by Caltrain and HSR services.



EXHIBITS

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	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
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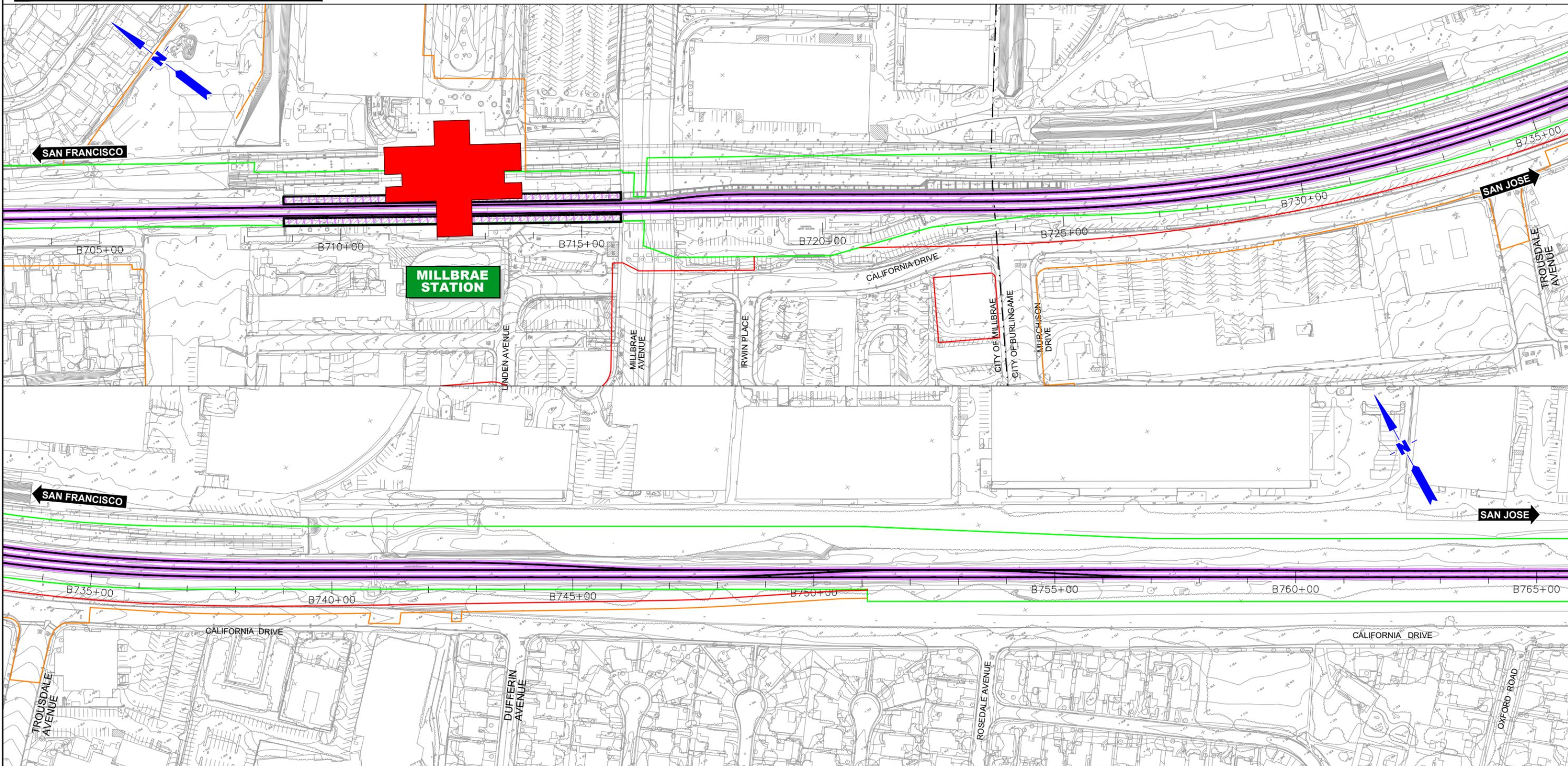
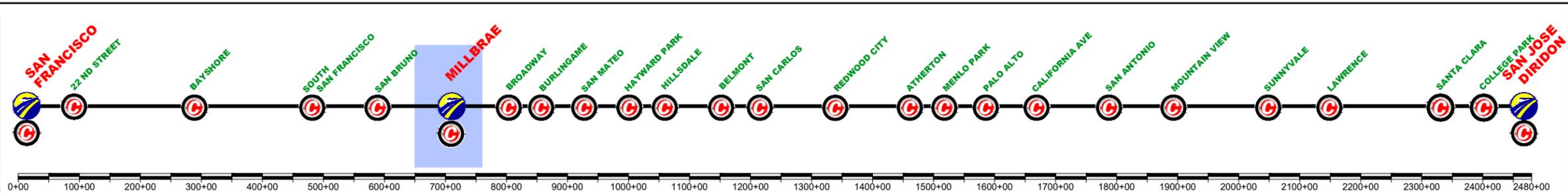
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CONSTRUCTION PHASES
PLAN
PHASE 0

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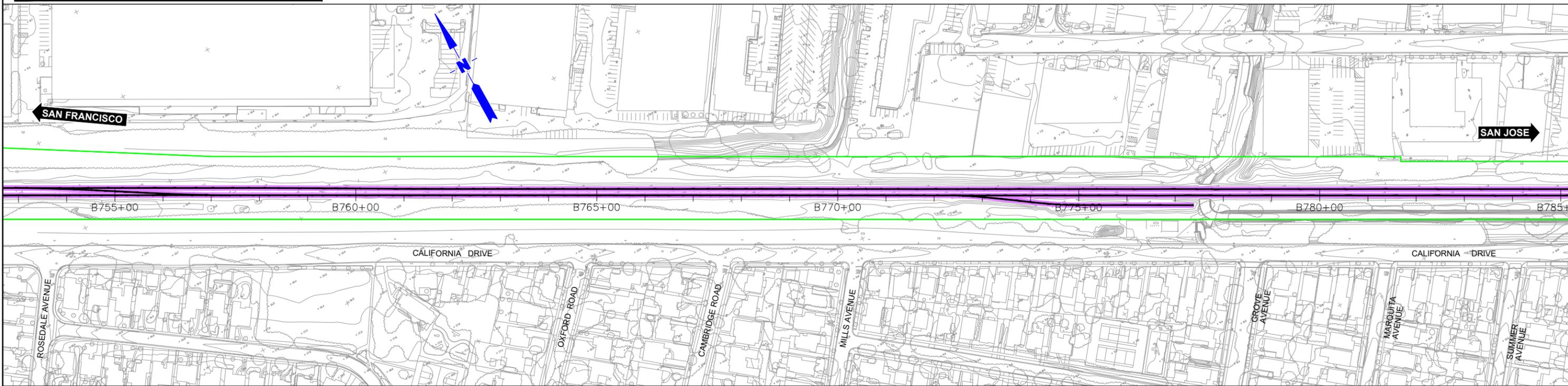
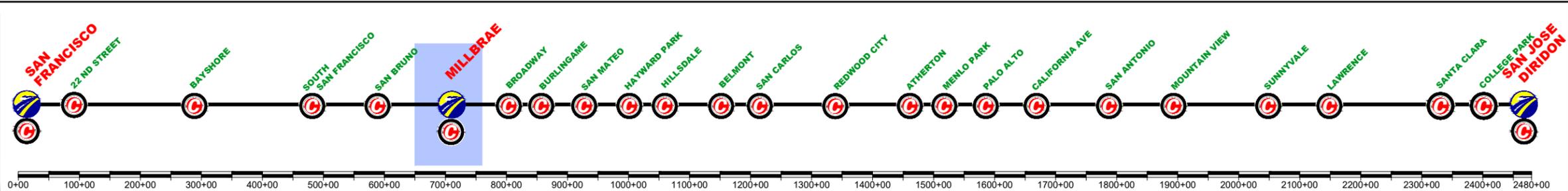
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PHASE 0

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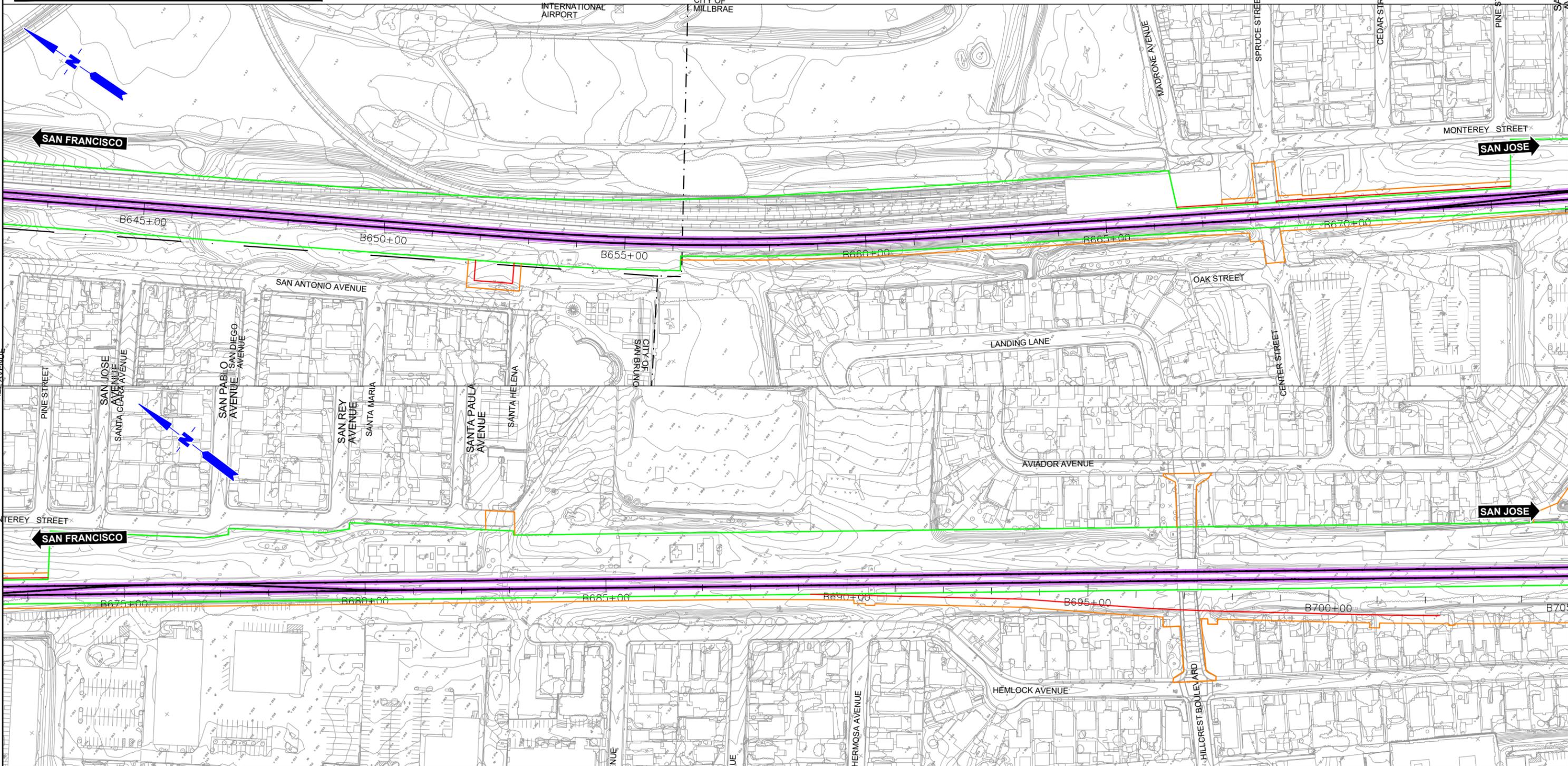
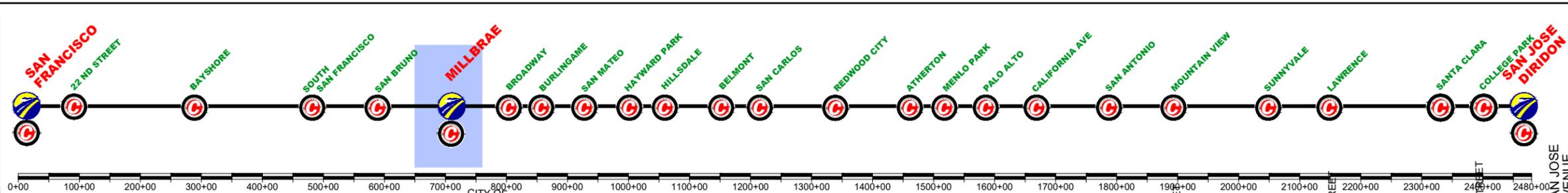
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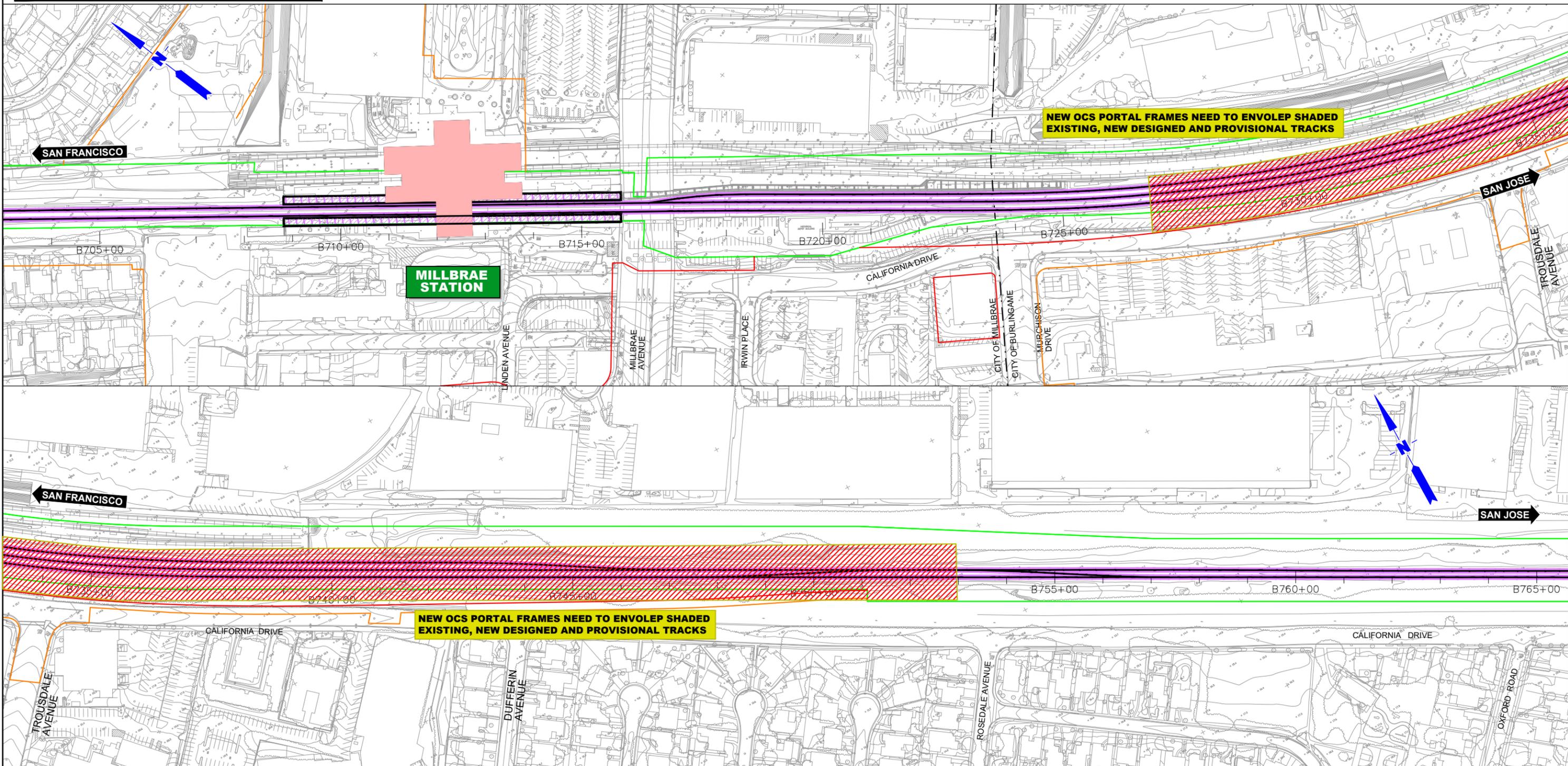
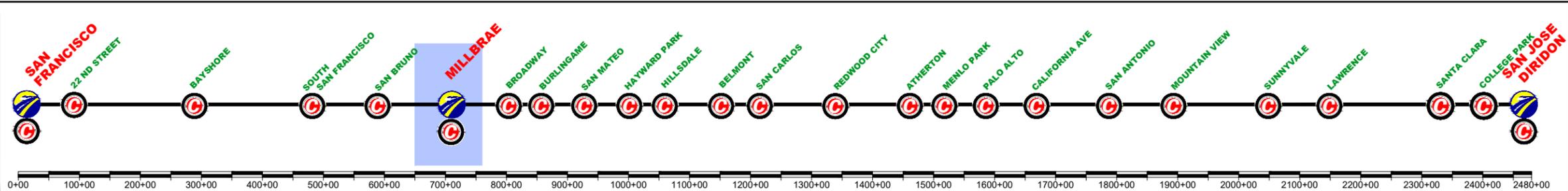
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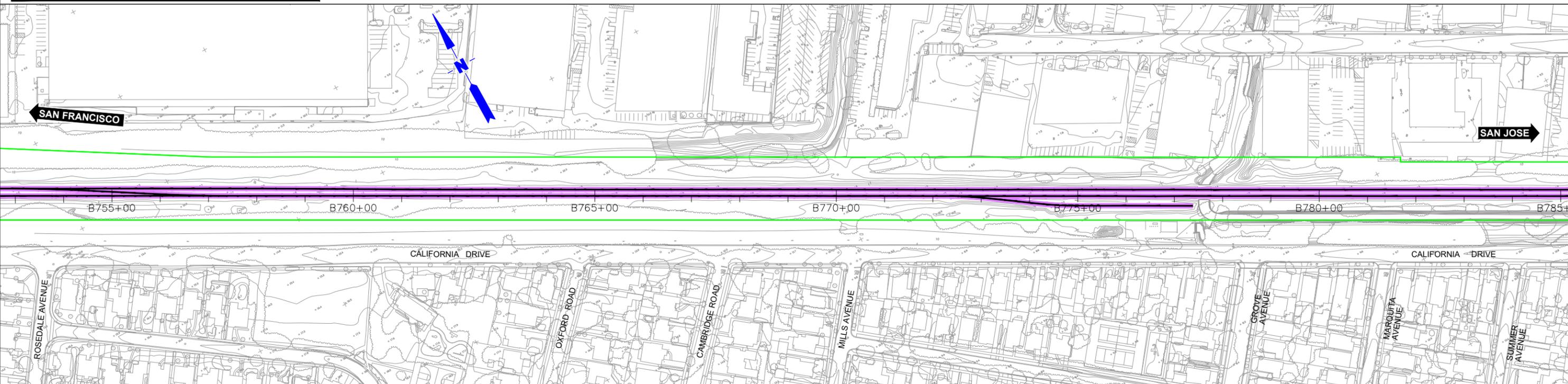
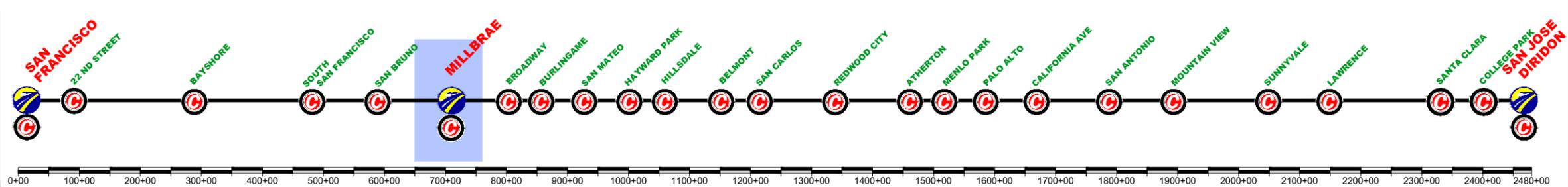
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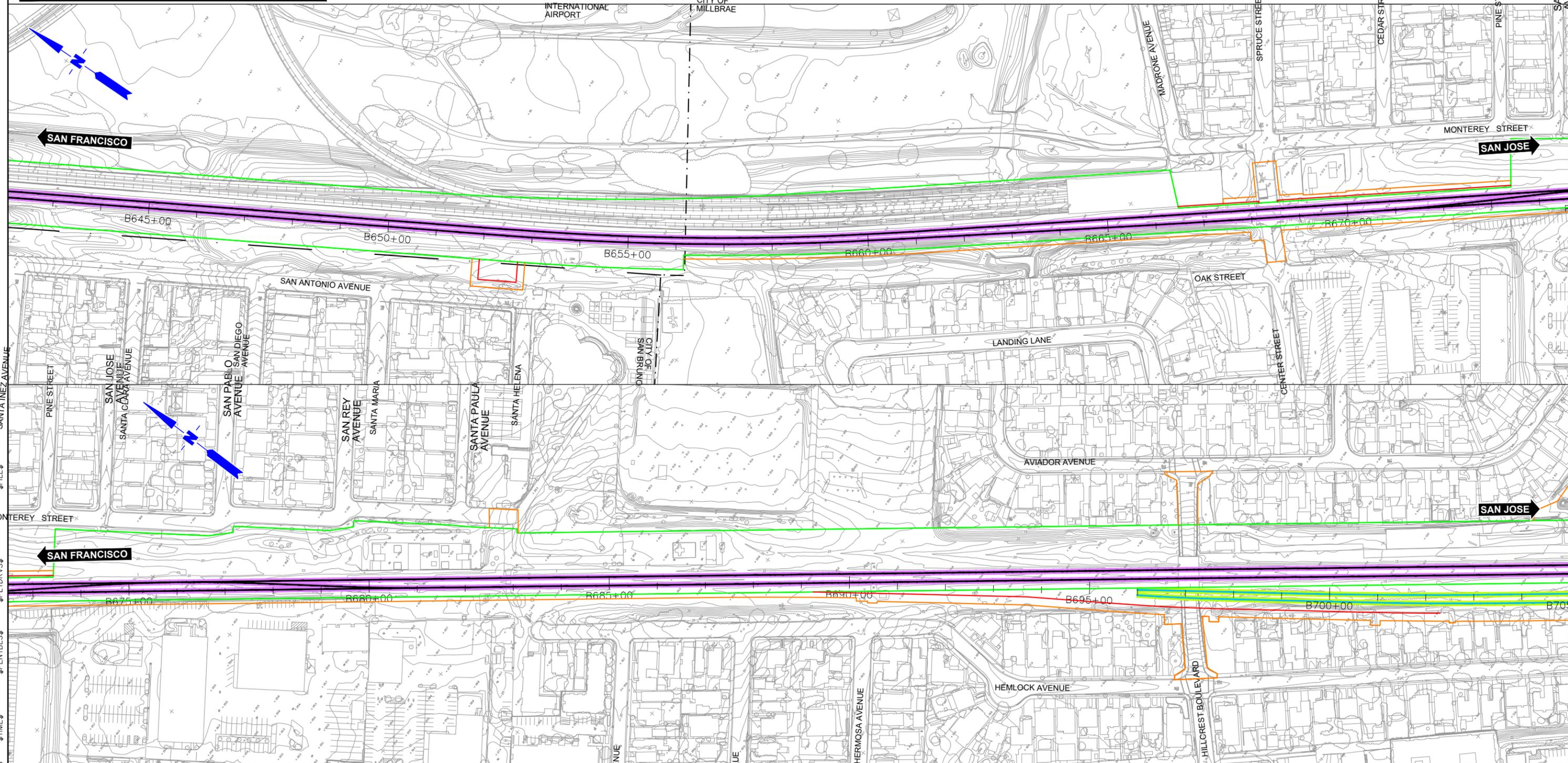
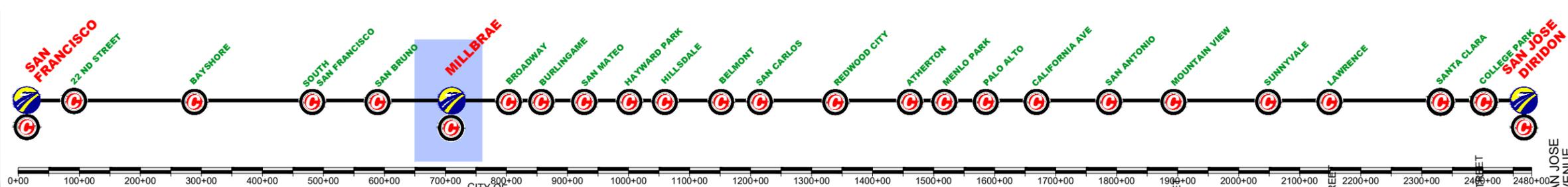
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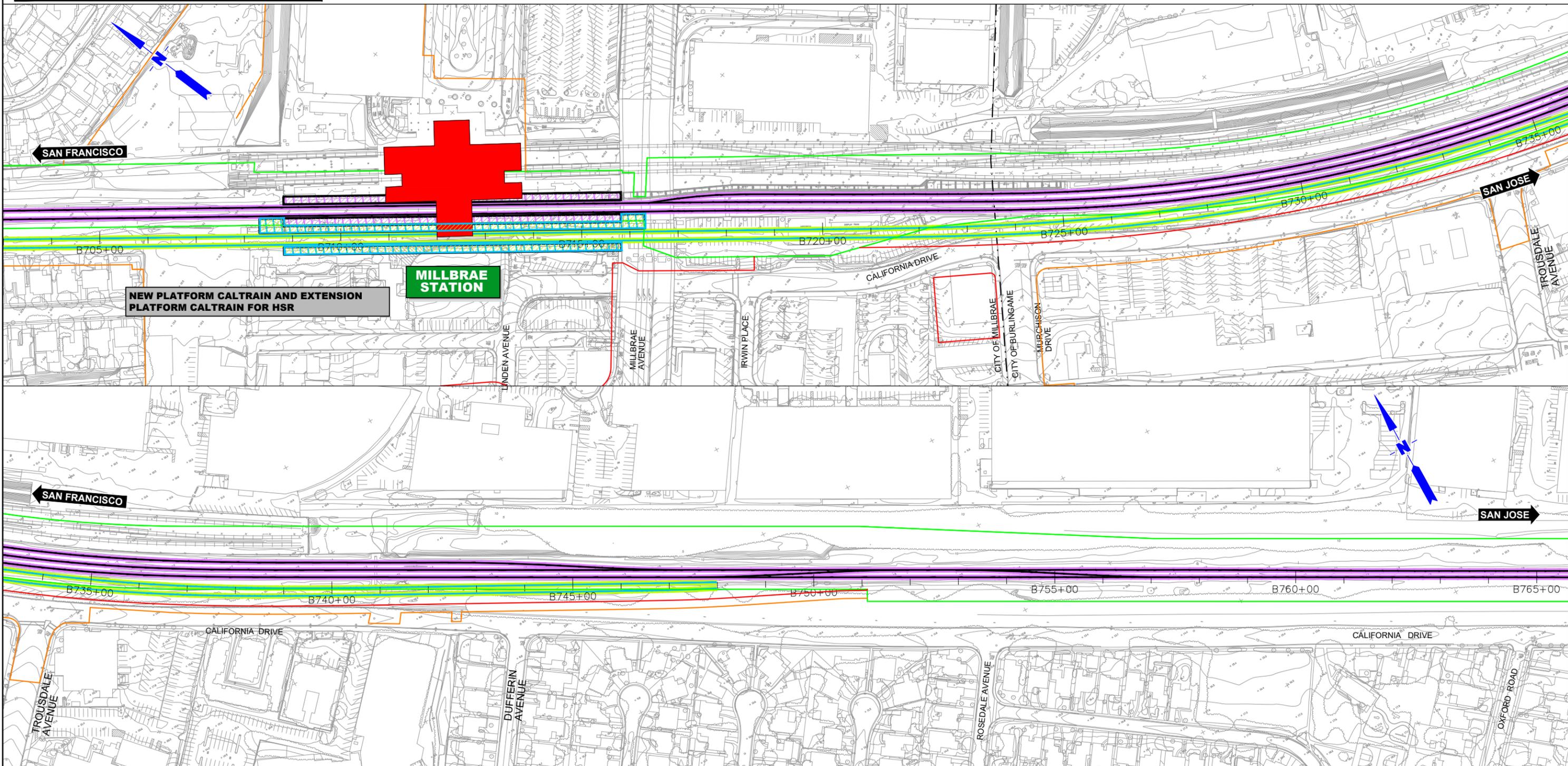
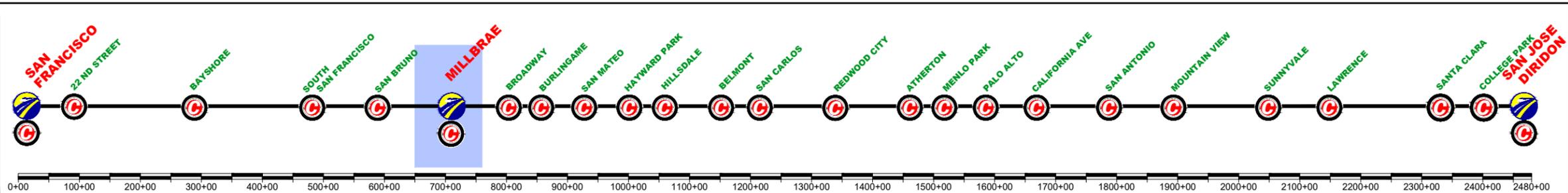
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PHASE 2

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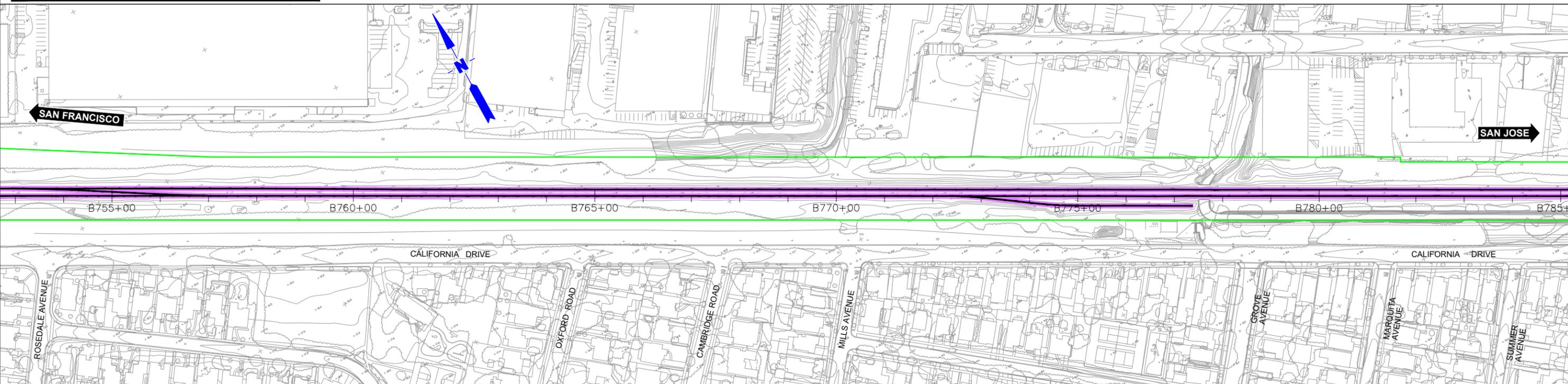
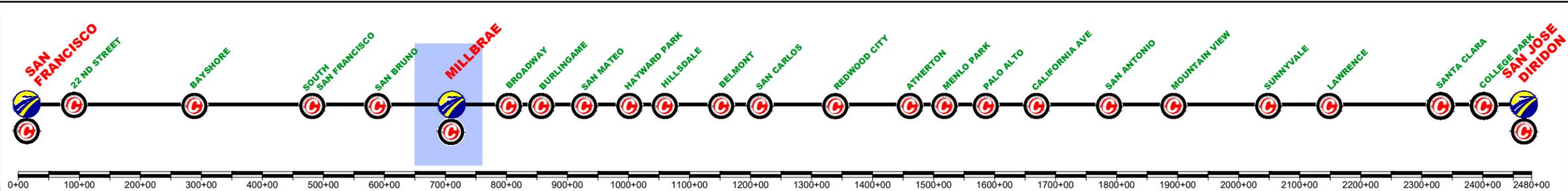
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	UNDER CONST + CIRCULATION T.		
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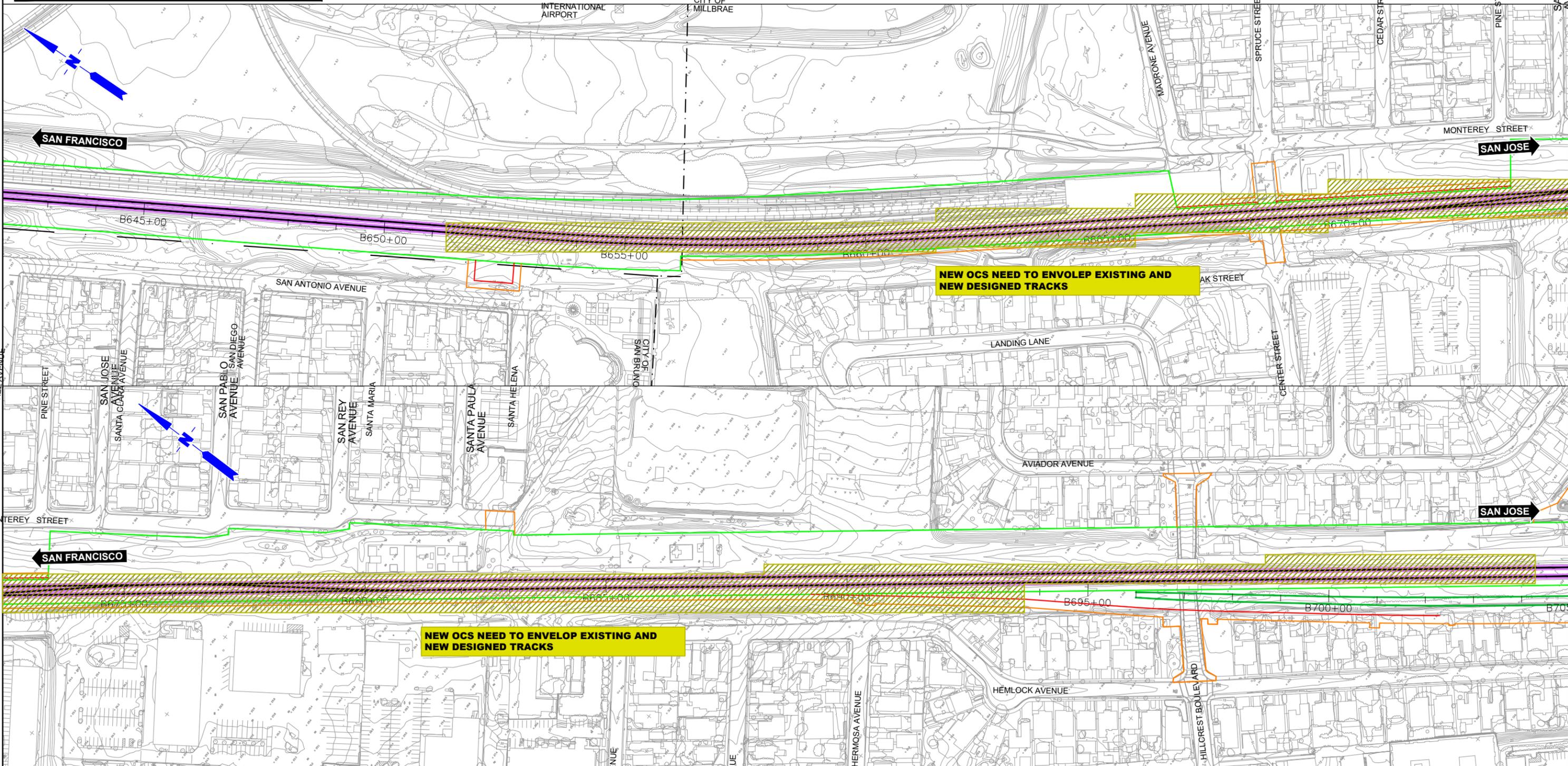
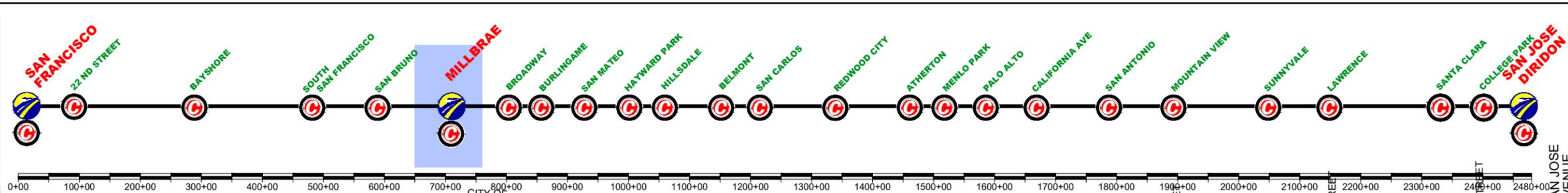
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 Oakland, CA 94607

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
 MILLBRAE STATION
 CONSTRUCTION PHASES
 PLAN
 PHASE 2

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH2-03
SCALE	1" = 200'
SHEET NO.	3 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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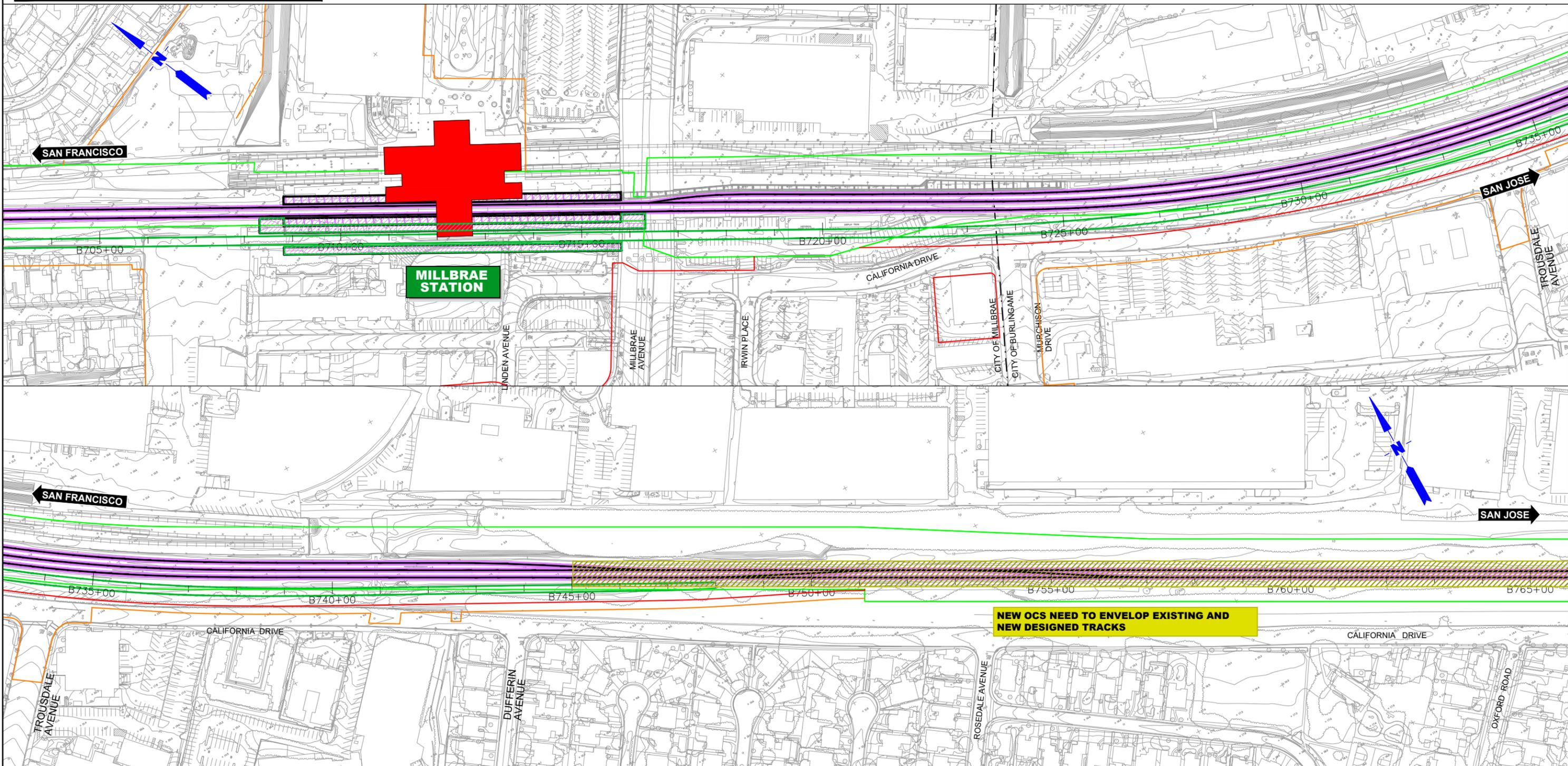
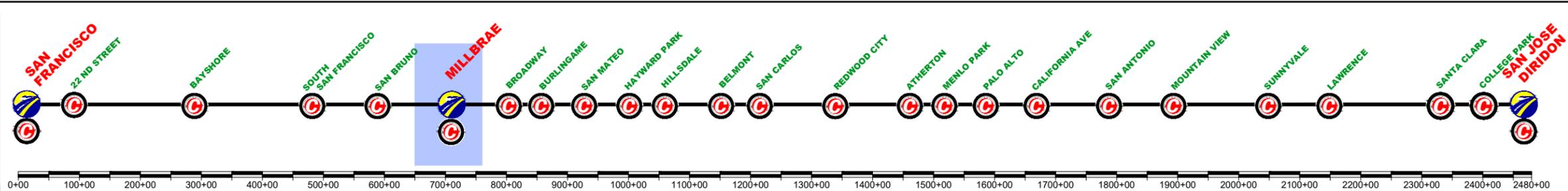
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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.
DRAWING NO.
CV-11MIL-PH3-01
SCALE
1" = 200'
SHEET NO.
1 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		
	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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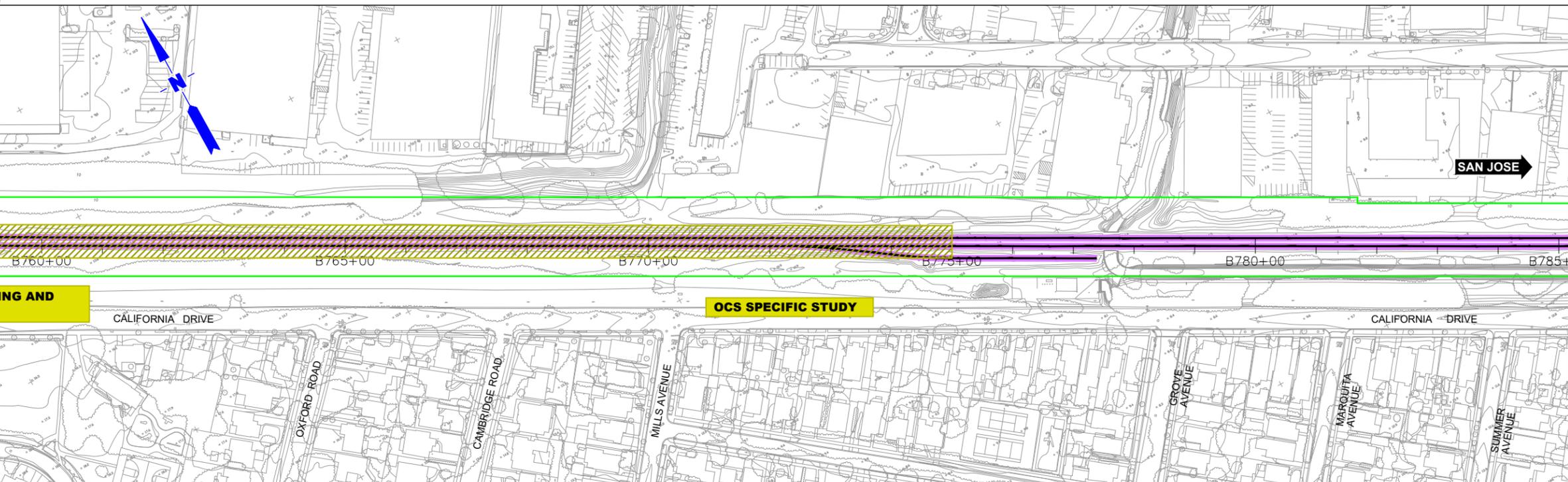
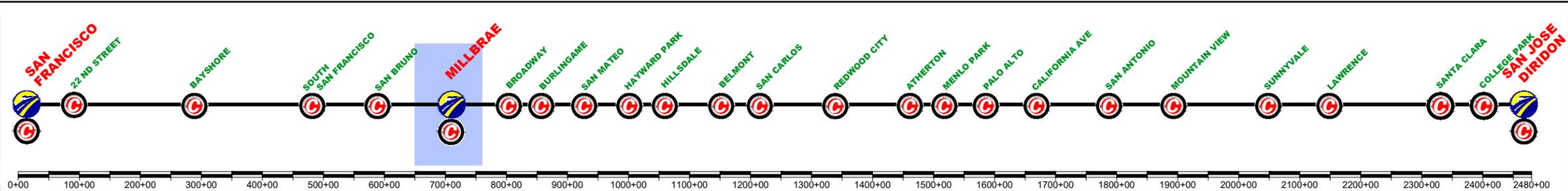
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SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 3

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH3-02
SCALE	1" = 200'
SHEET NO.	2 OF 3

REV	DATE	BY	SUB	APP	DESCRIPTION

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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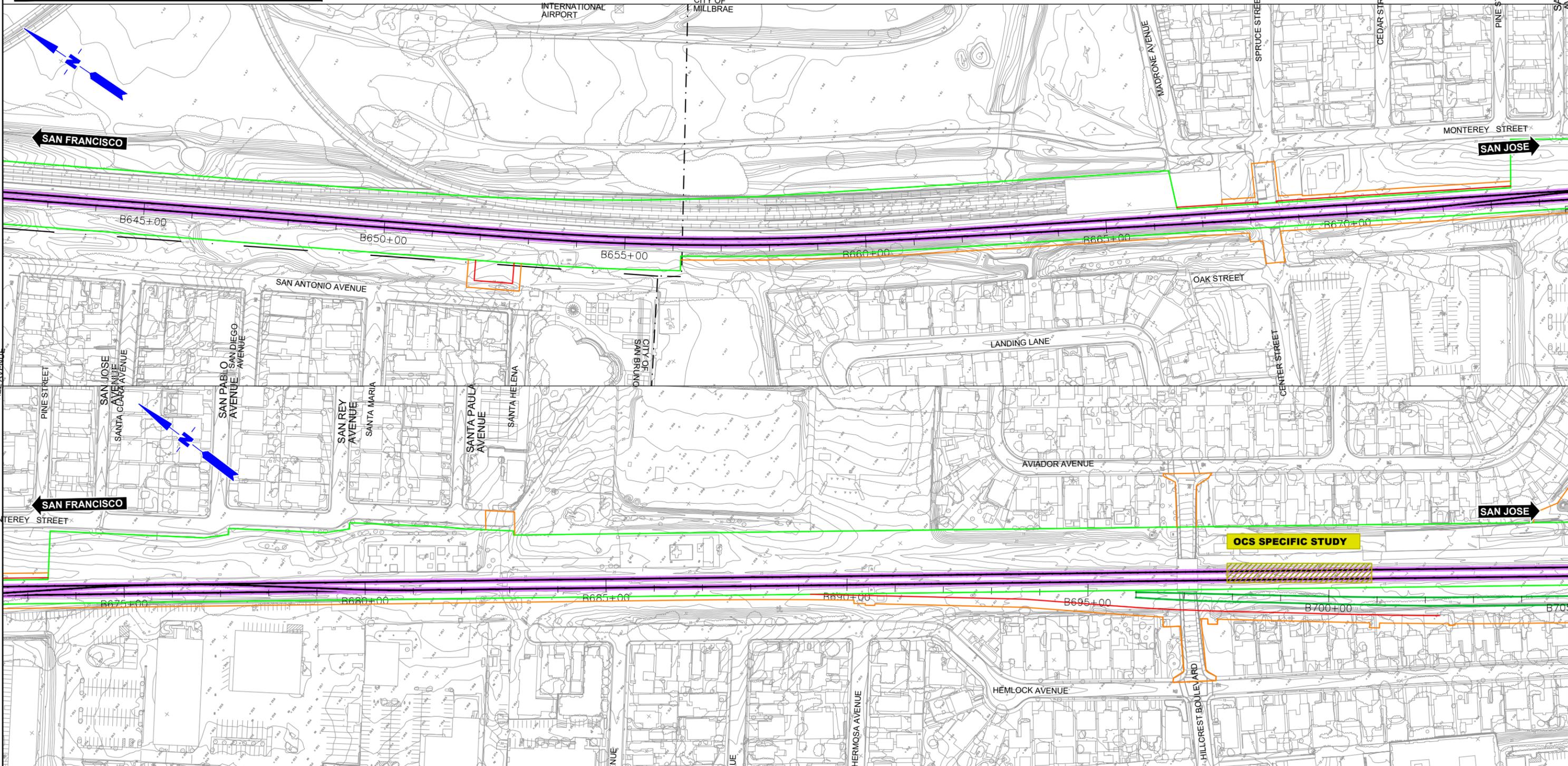
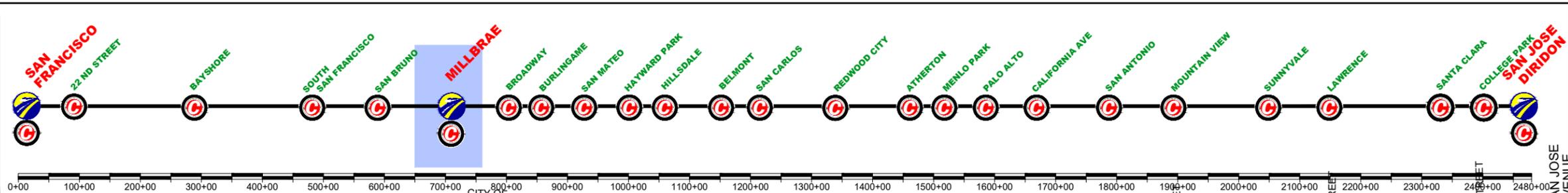
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SAN FRANCISCO TO SAN JOSE
 MILLBRAE STATION
 CONSTRUCTION PHASES
 PLAN
 PHASE 3

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH3-03
SCALE	1" = 200'
SHEET NO.	3 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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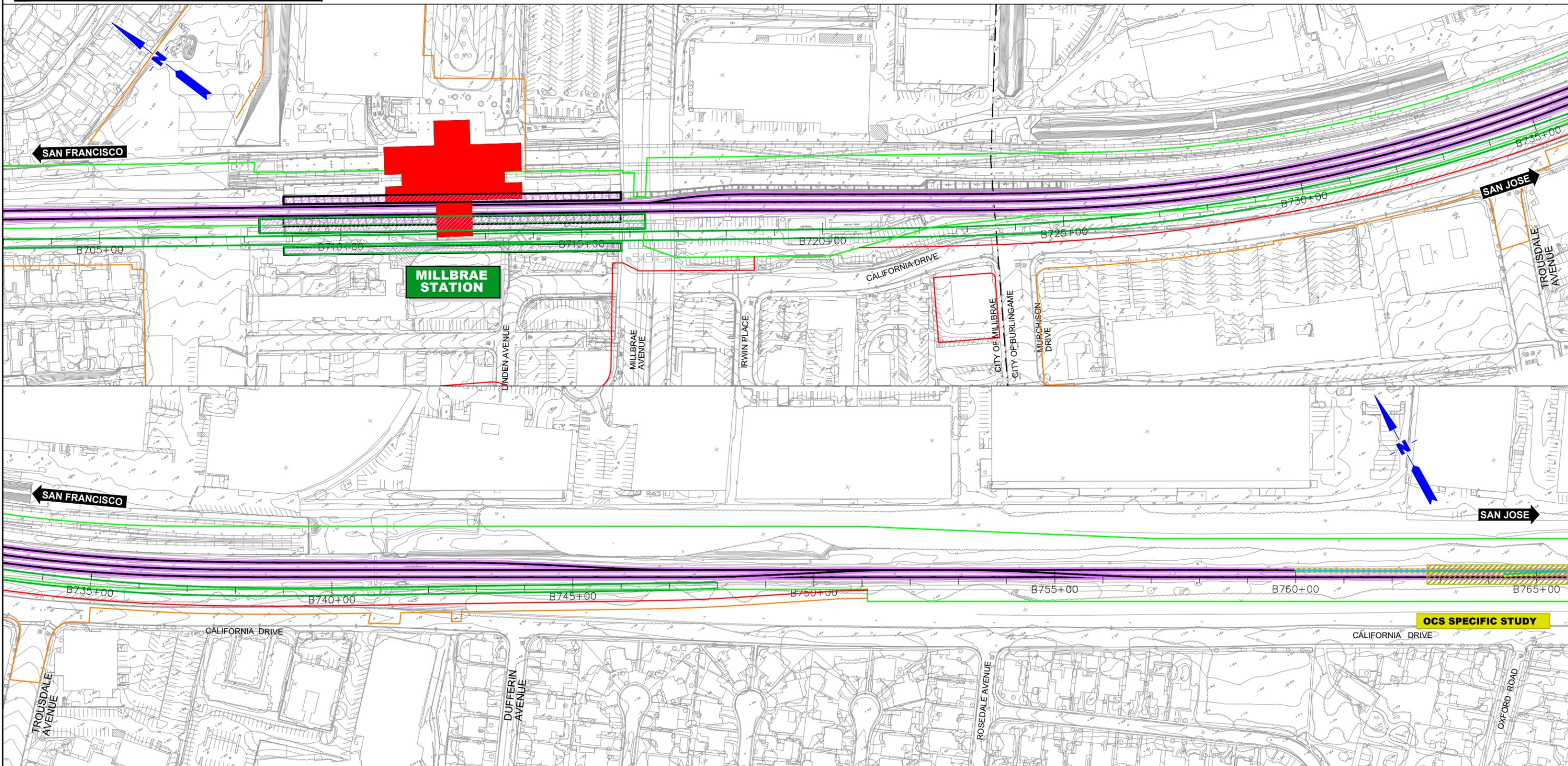
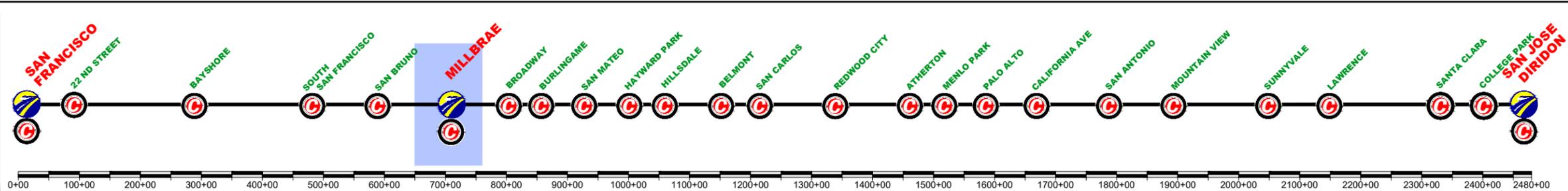
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SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
CV-11MIL-PH4-01
SCALE
1" = 200'
SHEET NO.
1 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		
	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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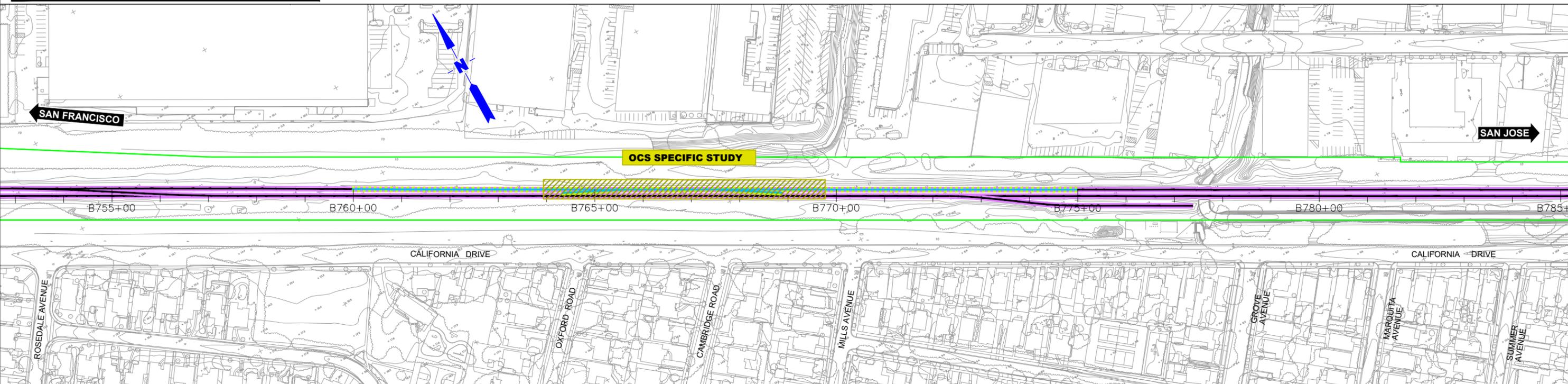
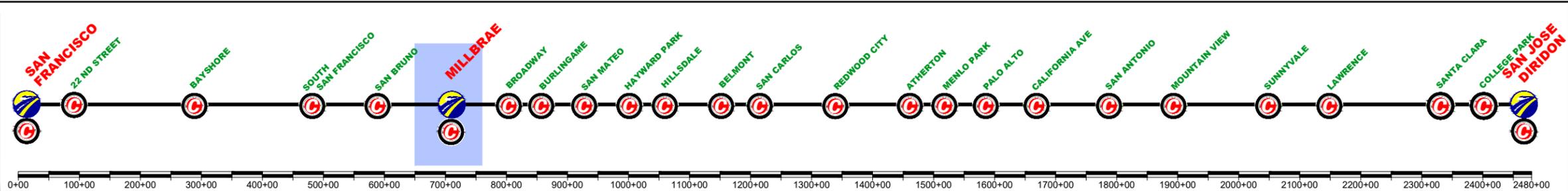
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SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 4

CONTRACT NO.
DRAWING NO.
CV-11ML-PH4-02
SCALE
1" = 200'
SHEET NO.
2 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		
	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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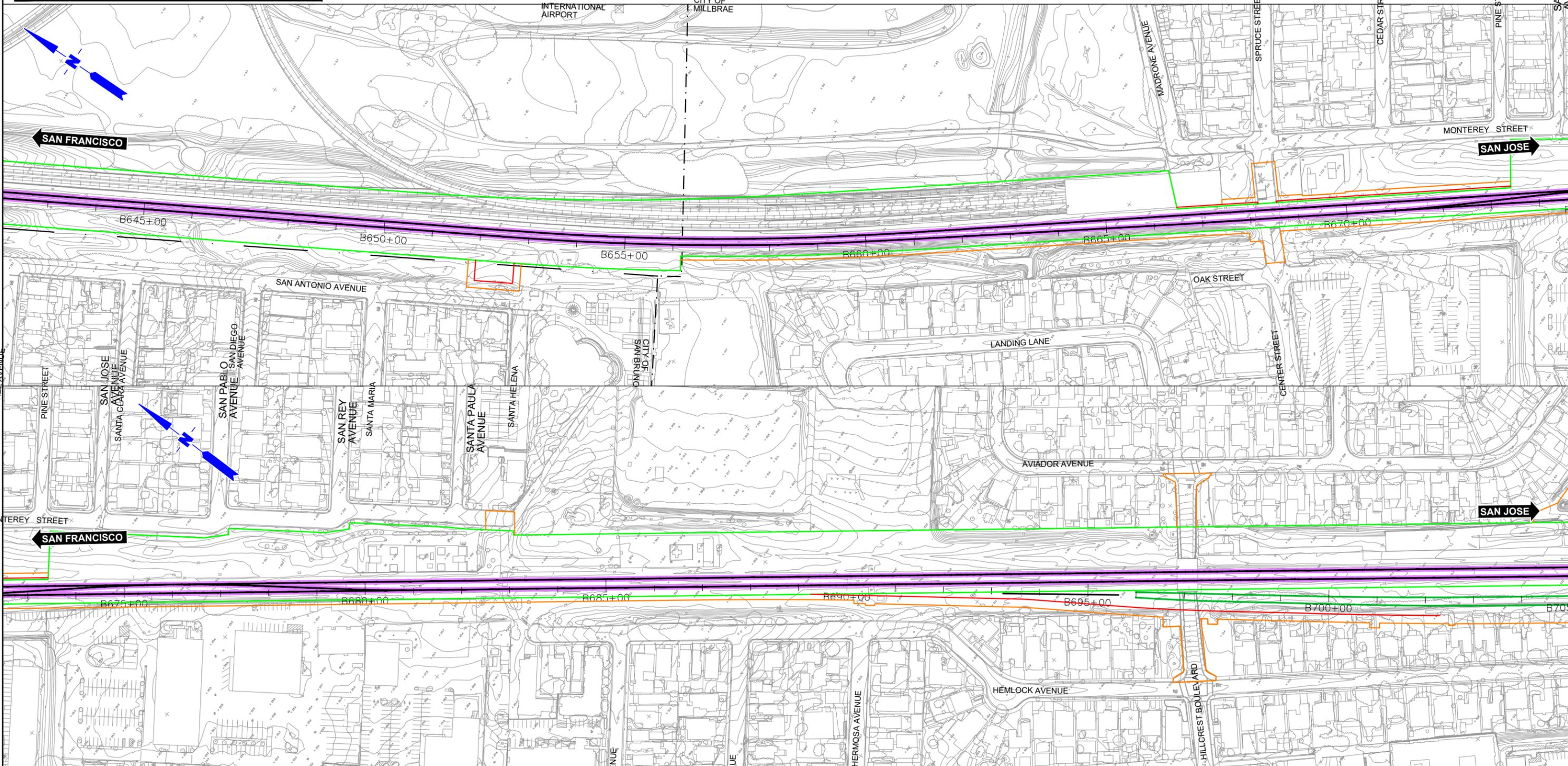
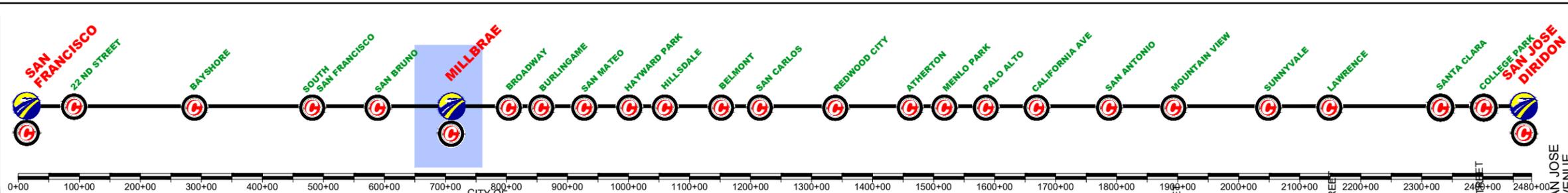
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SAN FRANCISCO TO SAN JOSE
 MILLBRAE STATION
 CONSTRUCTION PHASES
 PLAN
 PHASE 4

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH4-03
SCALE	1" = 200'
SHEET NO.	3 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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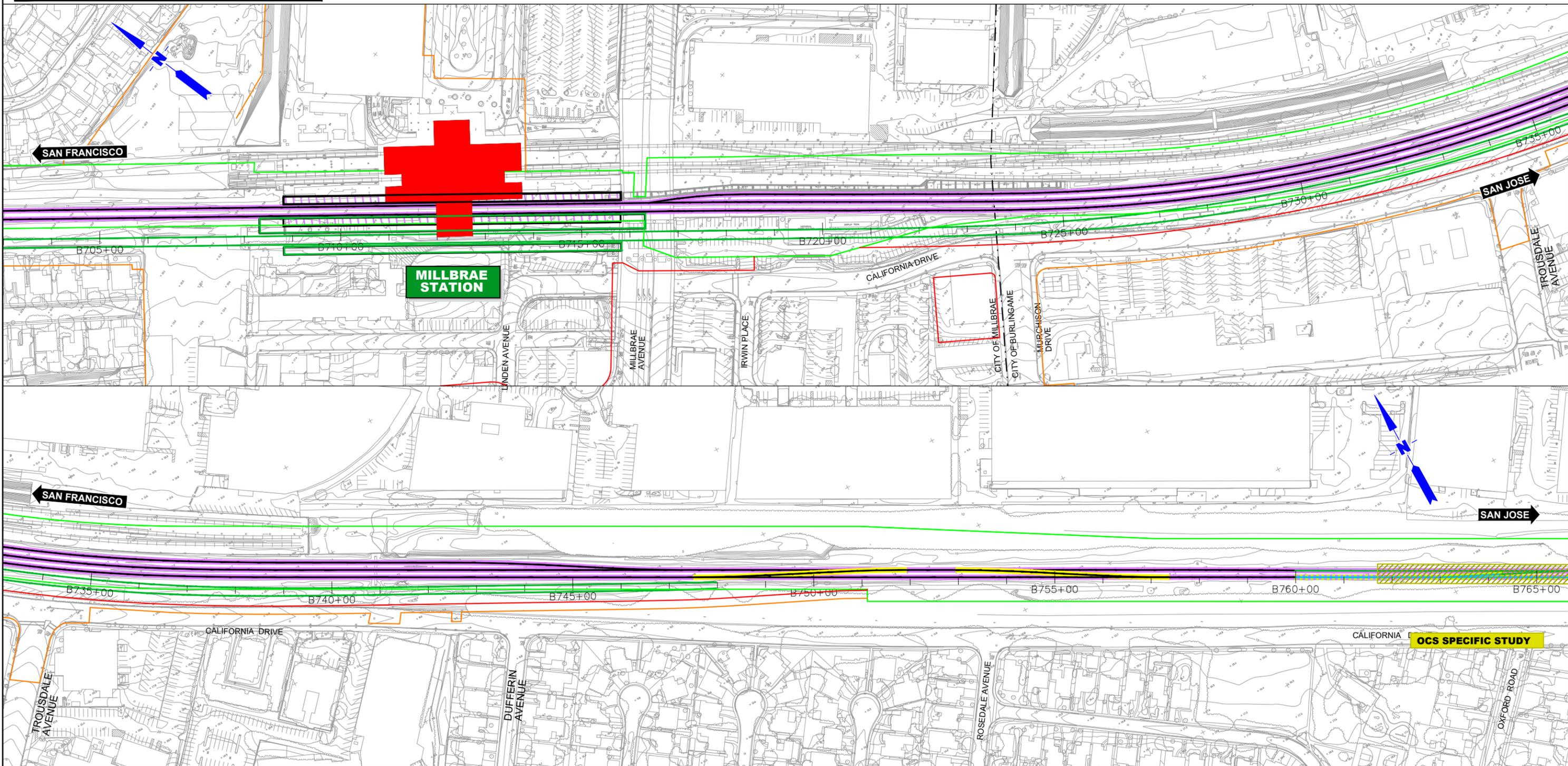
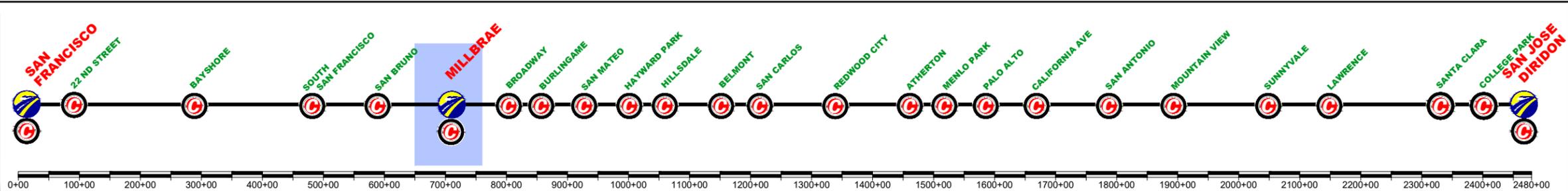
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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO.
CV-11MIL-PH5-01
SCALE
1" = 200'
SHEET NO.
1 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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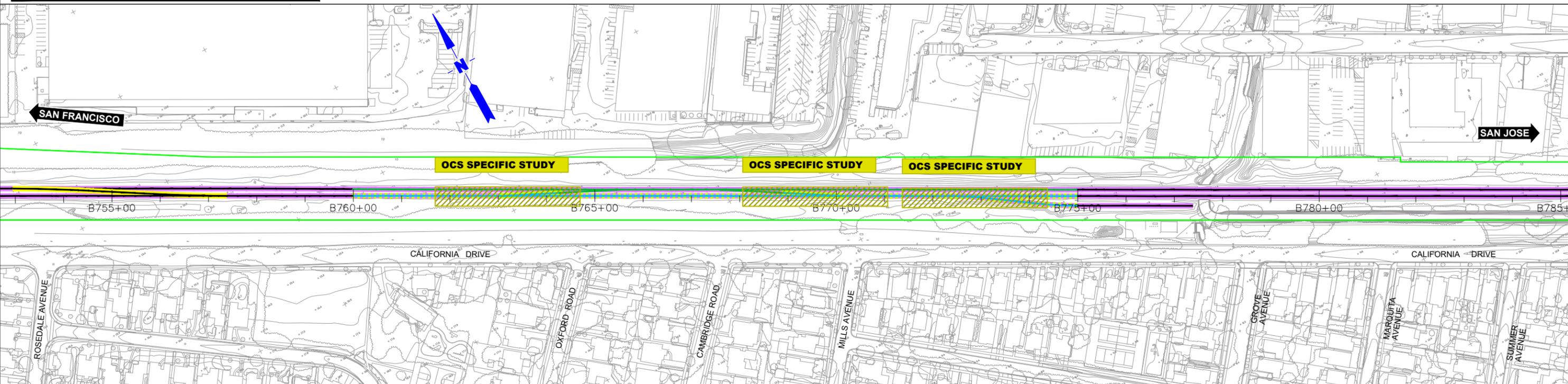
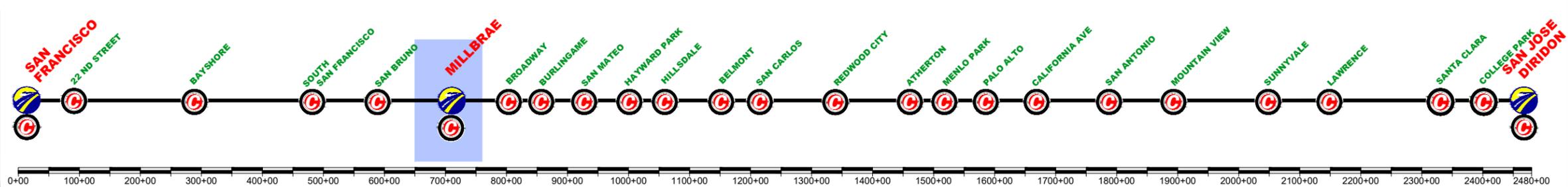
CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 5

CONTRACT NO.
DRAWING NO.
CV-11ML-PH5-02
SCALE
1" = 200'
SHEET NO.
2 OF 3

\$FILE\$
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 \$PENTBLS\$
 \$TIME\$
 \$DATE\$
 \$USER\$

OCS SPECIFIC STUDY

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		
	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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 \$USER\$

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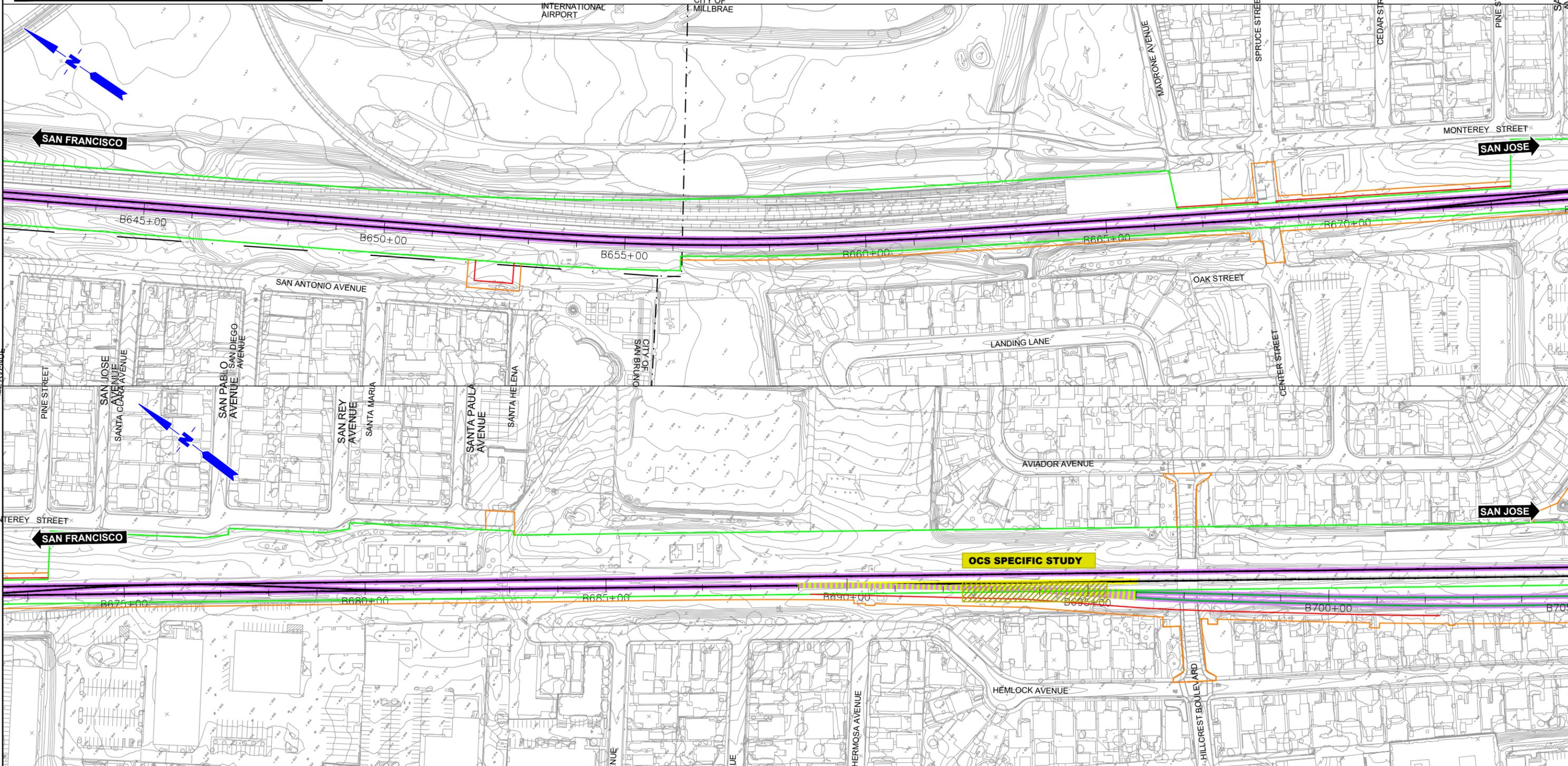
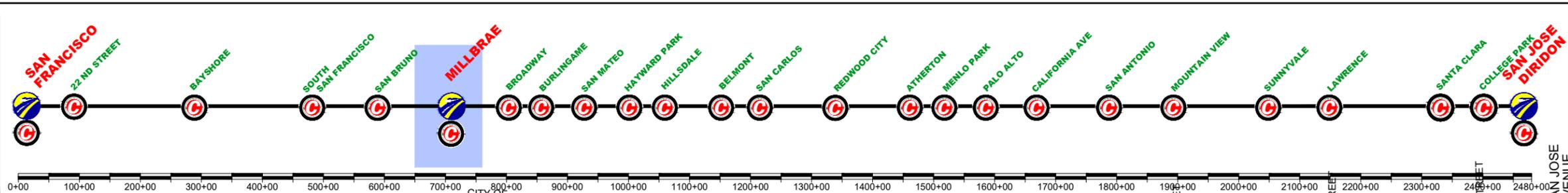
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CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
 MILLBRAE STATION
 CONSTRUCTION PHASES
 PLAN
 PHASE 5

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH5-03
SCALE	1" = 200'
SHEET NO.	3 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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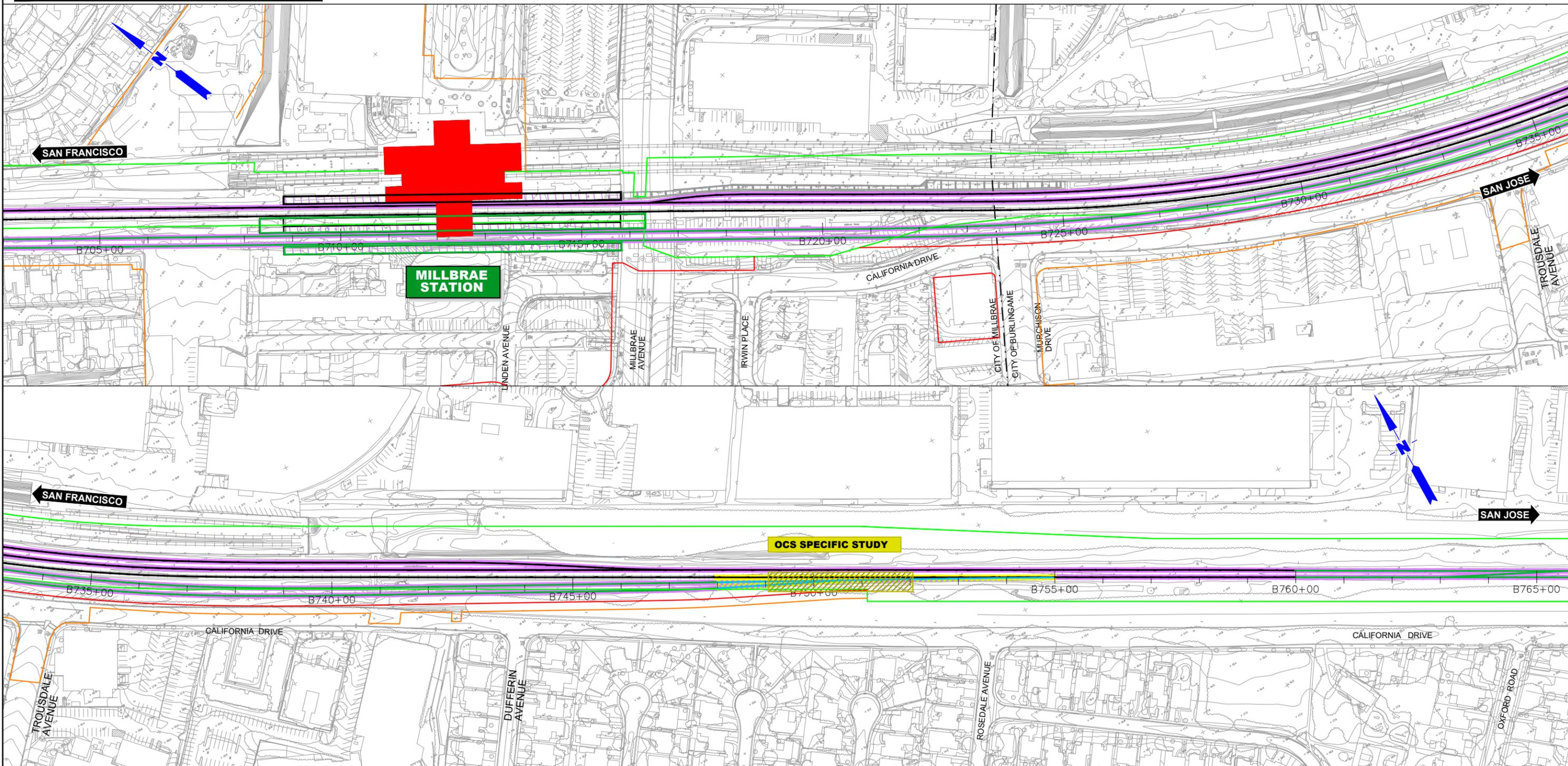
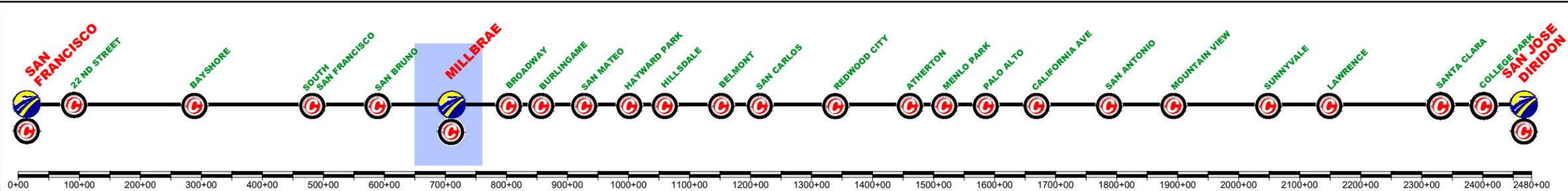
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High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO.
CV-11MIL-PH6-01
SCALE
1" = 200'
SHEET NO.
1 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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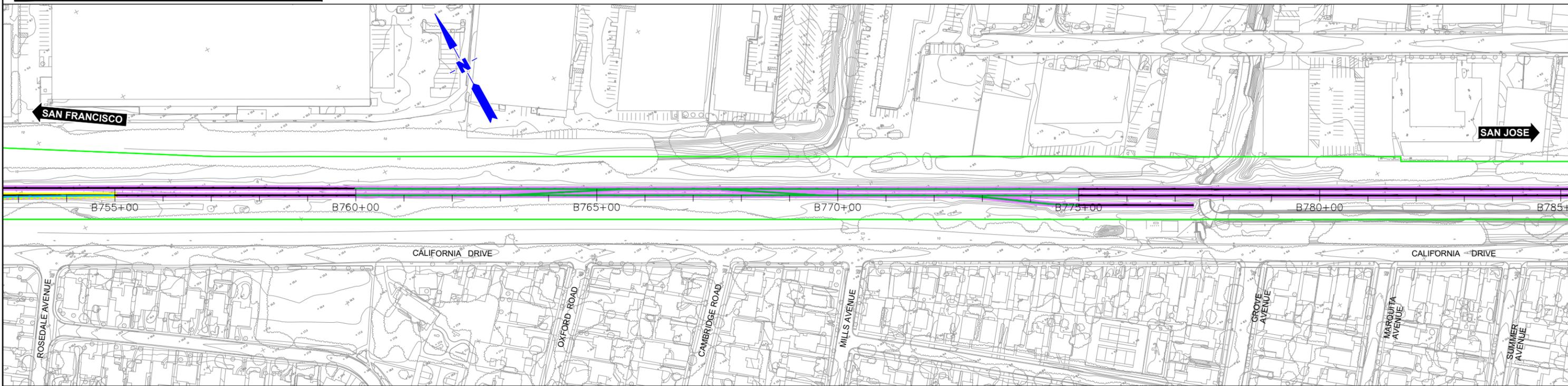
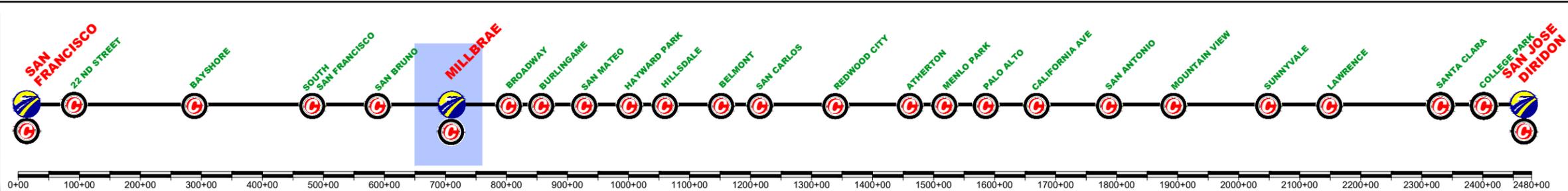
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SAN FRANCISCO TO SAN JOSE
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CONSTRUCTION PHASES
PLAN
PHASE 6

CONTRACT NO.
DRAWING NO.
CV-11ML-PH6-02
SCALE
1" = 200'
SHEET NO.
2 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		
	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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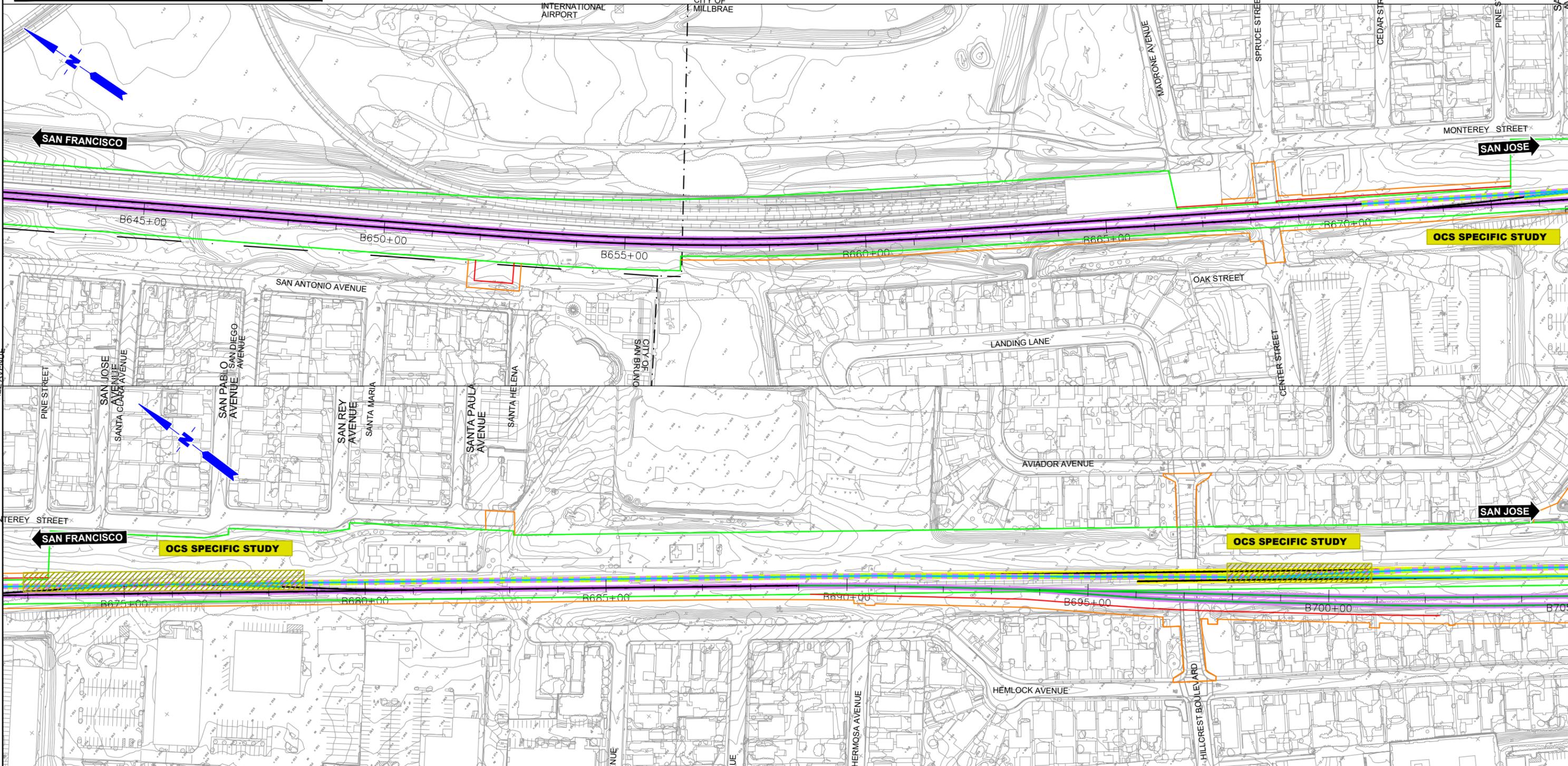
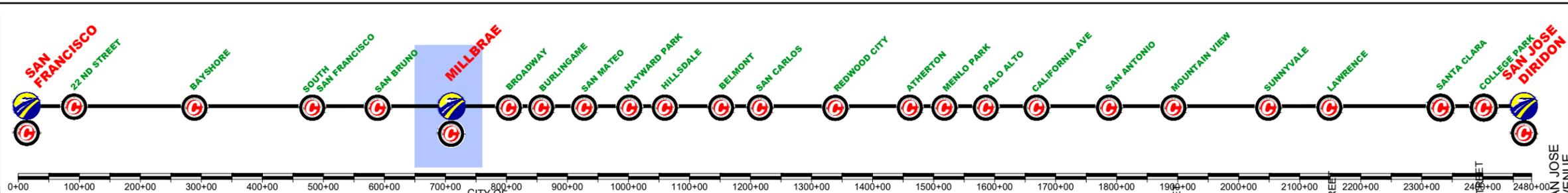
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SAN FRANCISCO TO SAN JOSE
 MILLBRAE STATION
 CONSTRUCTION PHASES
 PLAN
 PHASE 6

CONTRACT NO.	
DRAWING NO.	CV-11ML-PH6-06
SCALE	1" = 200'
SHEET NO.	3 OF 3

	CURRENT TRACK		TRACK REMOVAL
	PROVISIONAL TRACK		UNDER CONSTRUCTION
	BUILT IN PREVIOUS PHASES		CIRCULATION TRACK
	UNDER CONST + CIRCULATION T.		

	OVERHEAD BRIDGE		TUNNEL
	MAJOR UNDERPASS		GRADE CROSSING
	CREEK UNDERPASS		CURRENT ROW
			TCE
			ROW



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High-Speed Rail Authority

CALIFORNIA HIGH-SPEED TRAIN PROJECT
SAN FRANCISCO TO SAN JOSE
MILLBRAE STATION
CONSTRUCTION PHASES
PLAN
PHASE 7

CONTRACT NO.	
DRAWING NO.	CV-11MIL-PH7-01
SCALE	1" = 200'
SHEET NO.	1 OF 3