

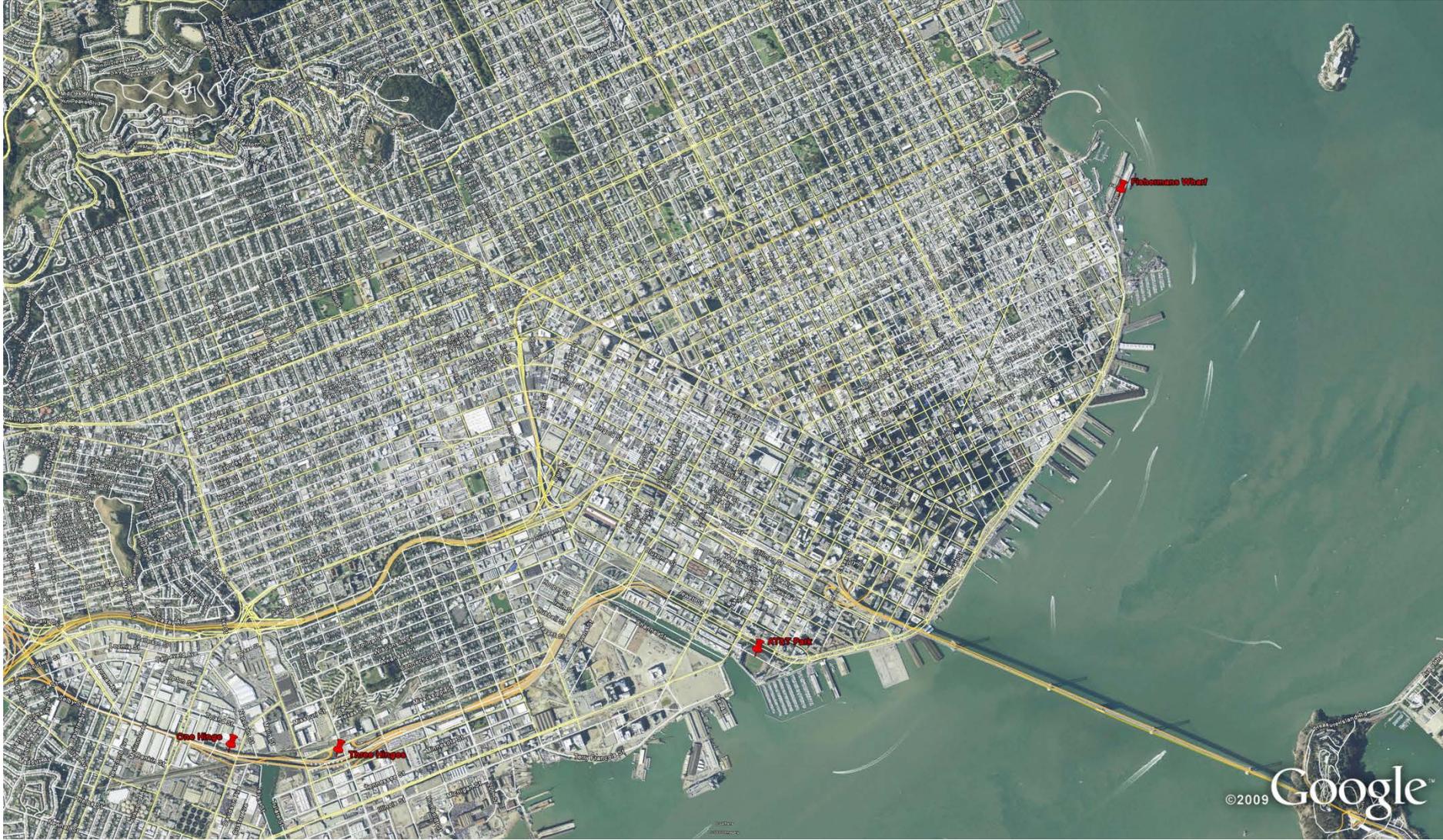
04-4A5101

SF-280- PM R5.2/R6.0

4 Bridge Hinge Replacements

Overview

- Location
- Structure
- Project History
- Hinge Condition
 - Photos of Typical Hinge Replacement
 - SF 280 Hinge Replacement
- Long Weekend Closures
- Impact
- Coordination





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Image © 2005 USGS

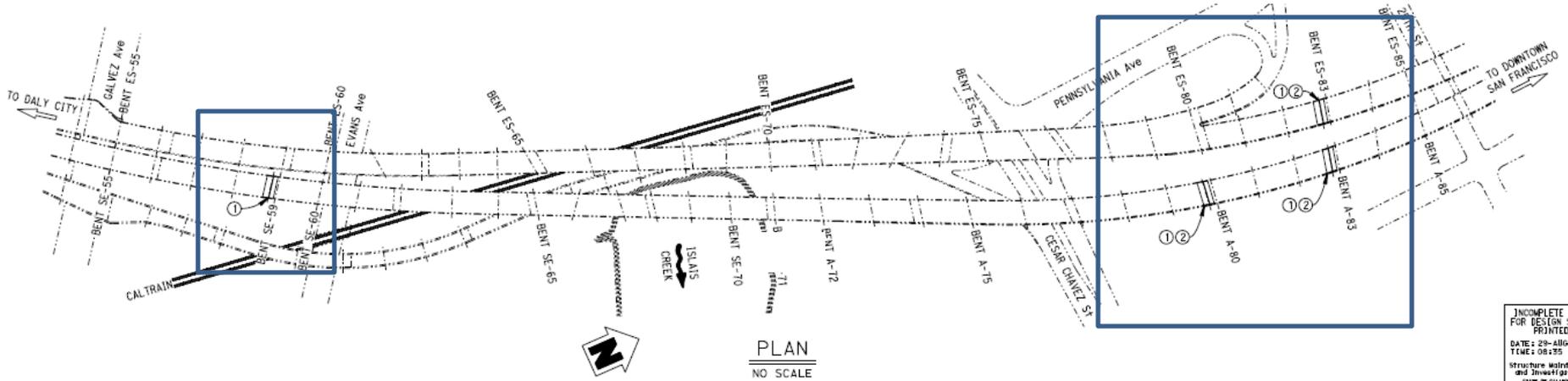
37°44'55.96" N 122°23'33.43" W elev 5 ft

Imagery Date: Jan 1, 2008



Eye alt 2967 ft

SF 280 Hinge Replacement Project – 04-4A510



INCOMPLETE PLAN
FOR DESIGN STUDY
PRINTED
DATE: 28-10-2012
TIME: 08:35
STRUCTURE INTERFERENCE
AND INVESTIGATIONS
DATE: 01/06/2012
DRAWING NO: 04-4A510/23

Structure

- Conventional Box Girder Structure Built in 1964
 - 56 ft wide X 5 ft deep (at hinge locations)
 - 110 Spans (5 to 31 Double Deck)
 - 4.09 miles in total lengths
 - Seismically Retrofitted in 1996
 - 4 Hinges to be replaced
 - Southbound (1 hinge) - 3 travel lanes with shoulders
 - Northbound (3 hinges) - 3 travel lanes with shoulders

Project History

- 11/2006
 - Bridge Inspection Report
 - Directors Order for further investigation
 - Identified 3 hinges to replace
- 2/2008
 - Project Initiation Document Approval
 - Programming (10/11 FY)
- 2/2009
 - Scope was changed to include an additional hinge
- 9/2011
 - Project schedule and cost updated
- 5/2012
 - 2 Stage Construction to Long Weekend Closures

HINGE CONDITION



HINGE CONDITION



Typical Hinge Replacement

TEMPORARY SUPPORT



KLAMATH RIVER BRIDGE HINGE REPLACEMENT APRIL-JULY 2006

DEMOLITION



DEMOLITION

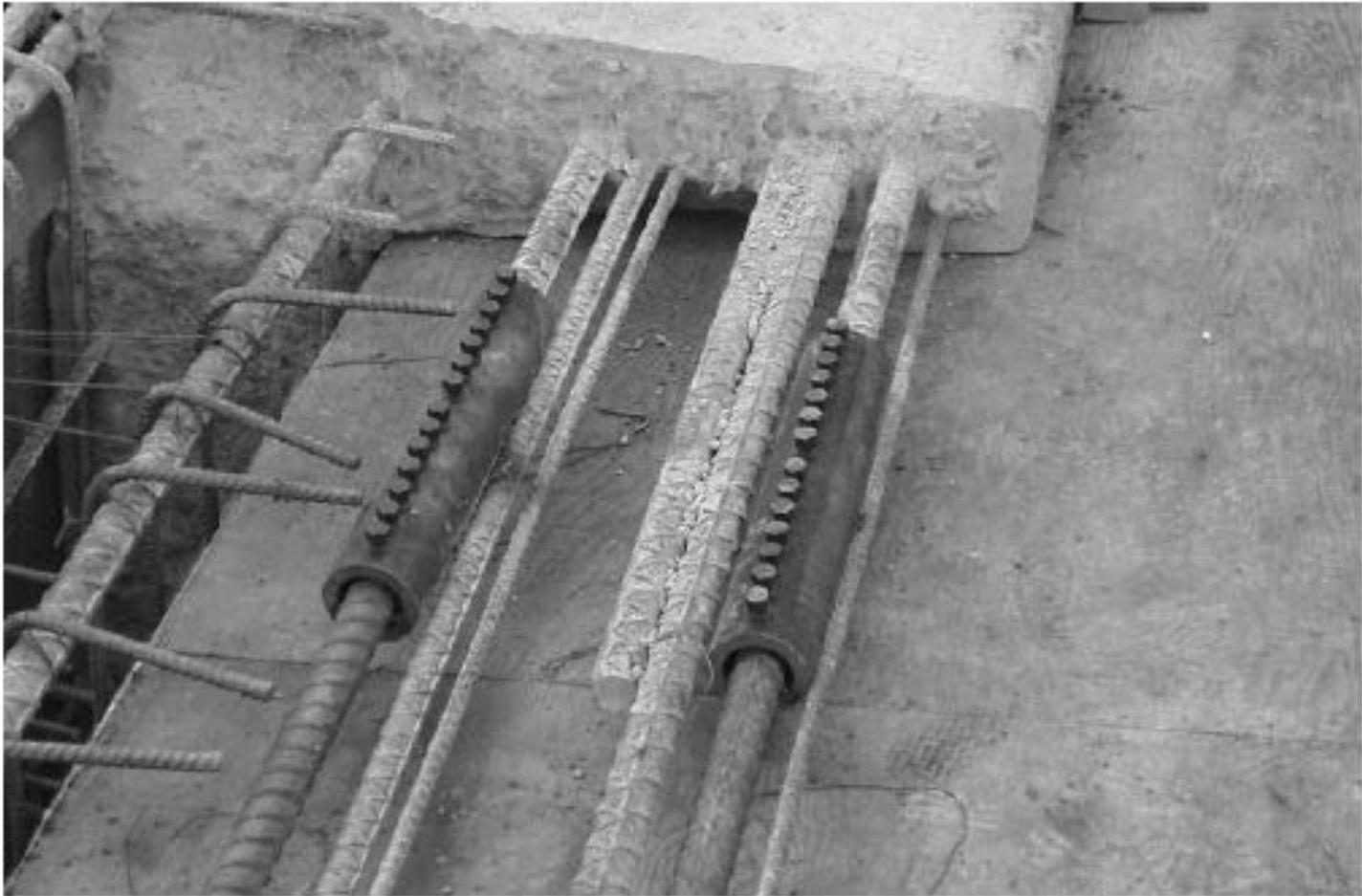


HINGE SEAT REBAR



STAGE 1 - HINGE SEAT REBAR

REBAR COUPLERS

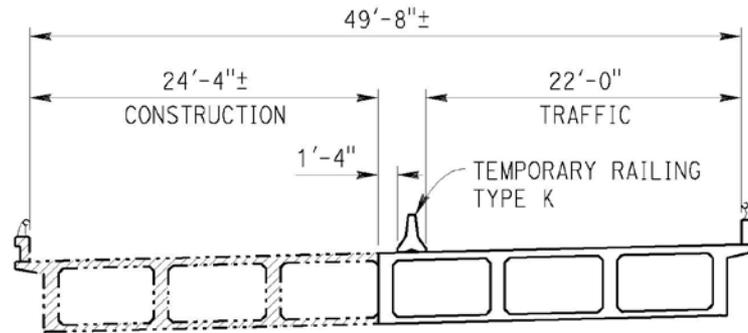


Hinge Replacement on SF 280

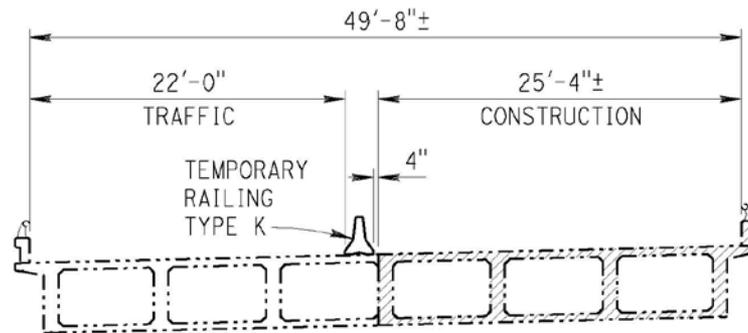
4 Stage Construction

- 1/4 Freeway Closure
 - Keep 3 lanes open at all times
 - Construct $\frac{1}{4}$ of hinge per location
 - Reduced lane width and traveling speed will likely yield similar traffic delays as 2-stage-construction
 - Traveling Public and Construction Worker Safety
 - Const. Zone Ingress, Egress & Equipment Access
 - Three Transverse Construction Joints
 - May take more than 12 months to complete

2 Stage Construction



STAGE 2



STAGE 1

STAGING AT BENT SE-59

NO SCALE

2 Stage Construction

- Half Freeway Closure
 - Keep 2 lanes open at all times
 - Reconstruct $\frac{1}{2}$ of hinge per location
 - Traffic Delays Estimated 1 hour and 45 minutes during peak commute hours (7 miles backup two times per day)
 - One Transverse Construction Joint
 - Original Design was based on this option
 - May take up to 12 months to complete

Weekend/Full Closure Construction

- Full Freeway Closure
 - Minimize work day commute
 - Require minimum 4 days of full freeway closure per location + several subsequent night lane closures to complete bridge rails/joint seals
 - Multiple location at a time?
 - Traveling public will have to utilize detours to SF 101 and public transportation

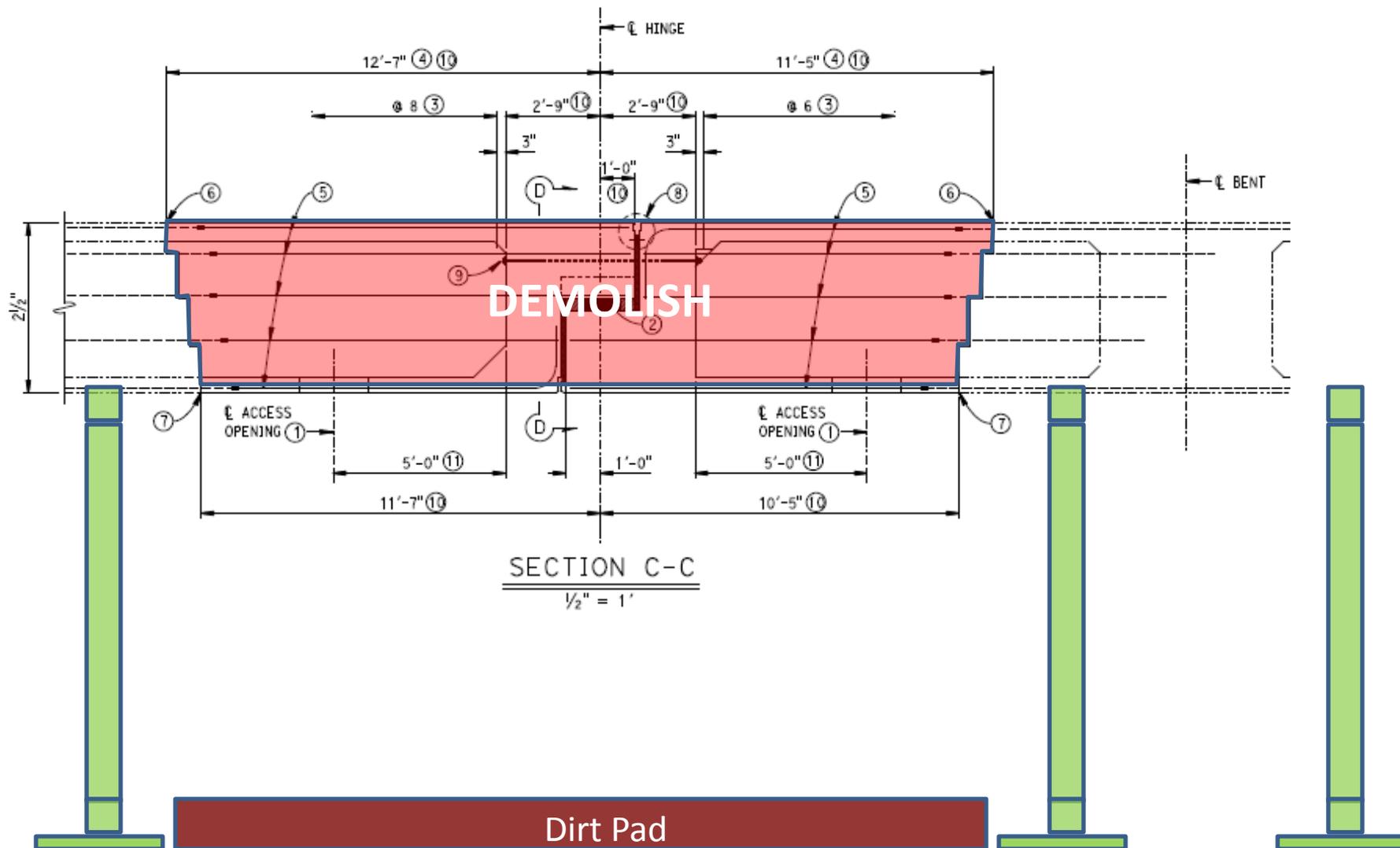
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104

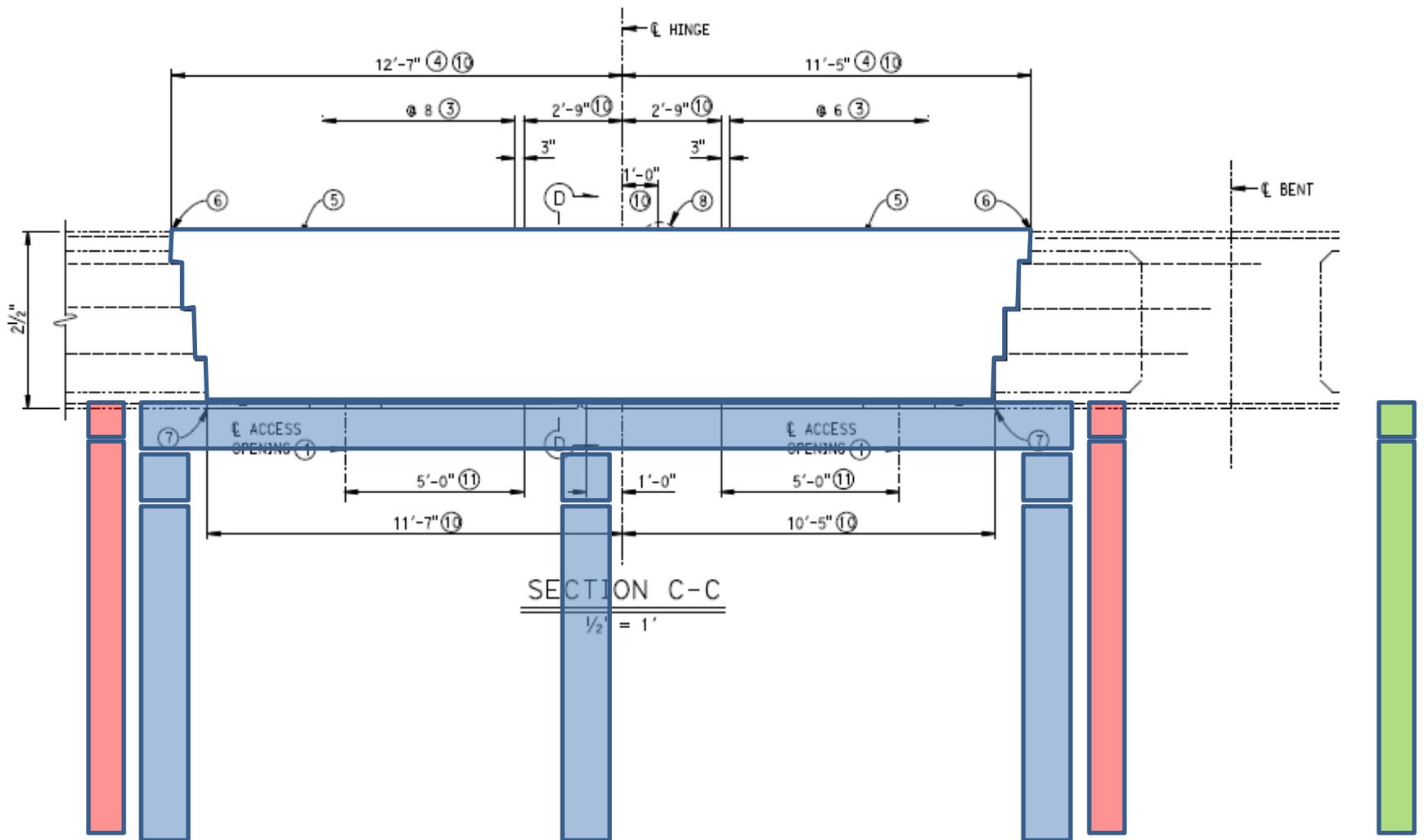
Temporary supports - both sides of the hinge + Long Span
 Soffit Removal for four 2X2 access openings in middle bays
 Temporary supports in the bay for demo equipment - hinge top side
 Prep girder construction joints

mount concrete saw to cut girders	
saw girders, barrier & deck free	6
demolition of the hinge & Clean up	12
Falsework for the new hinge & Soffit form	8
Seat side hinge steel/couple/form (hinge and stem)	8
Conc. Pour 1 - Hinge Seat & Stem + Cure	8
Strip Form - Prep hinge seat & form Lost deck + deck steel	12
Top side hinge steel/couple/form (top hinge & stem)	0
Conc. Pour 2 - Hinge Top & Stem + Cure	8
Strip Form - install hinge hardware & form Lost deck + deck steel + remove in-bay temp support	8
Conc. Pour 3 - Deck + Cure	8
Total	78

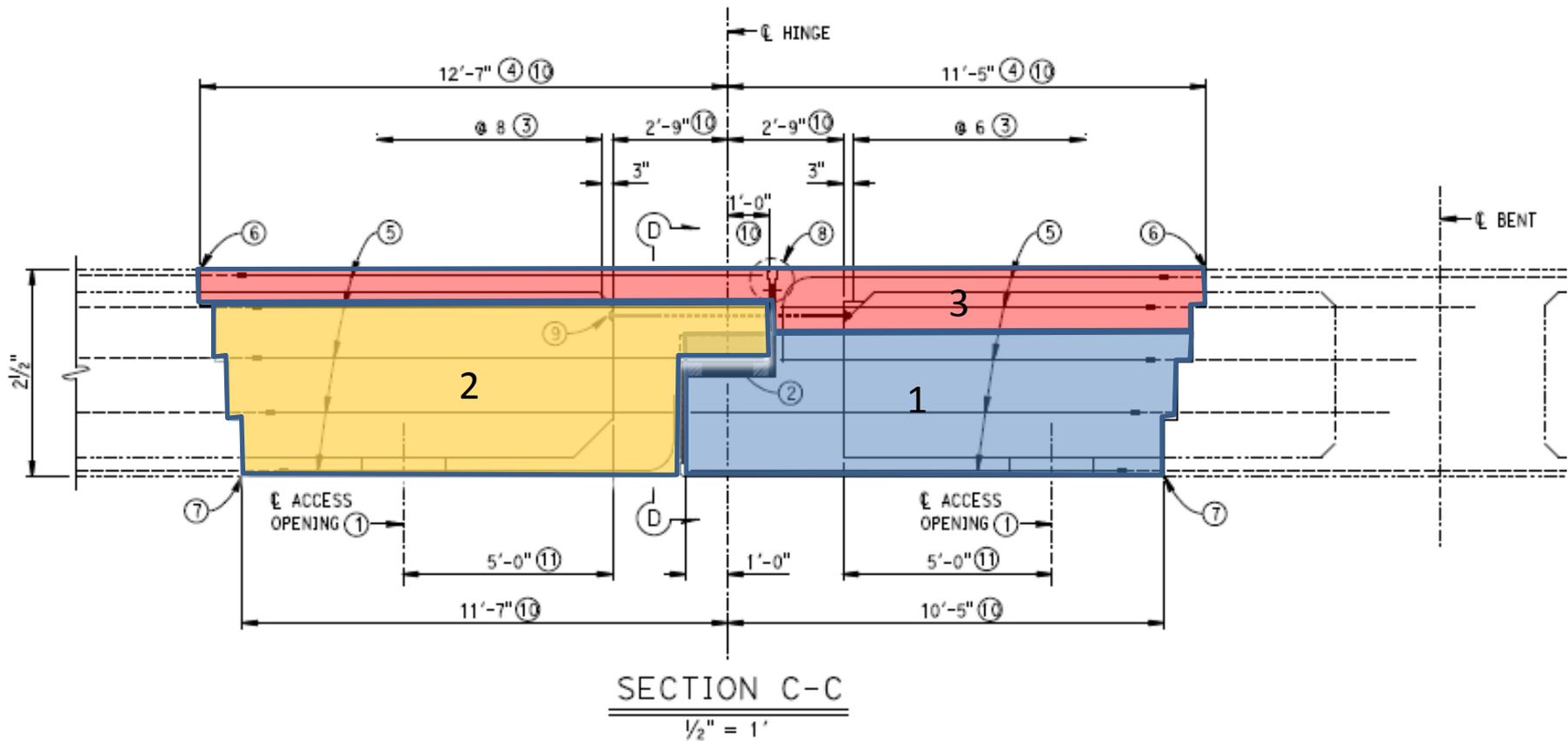
saw girders, barrier & deck free	8
demolition of the hinge & Clean up	16
Falsework for the new hinge & Soffit form	12
Seat side hinge steel/couple/form (hinge and stem)	10
Conc. Pour 1 - Hinge Seat & Stem + Cure	12
Strip Form - Prep hinge seat & form Lost deck + deck steel	14
Top side hinge steel/couple/form (top hinge & stem)	0
Conc. Pour 2 - Hinge Top & Stem + Cure	12
Strip Form - install hinge hardware & form Lost deck + deck steel + remove in-bay temp support	10
Conc. Pour 3 - Deck + Cure	10
Total	104

FLOAT

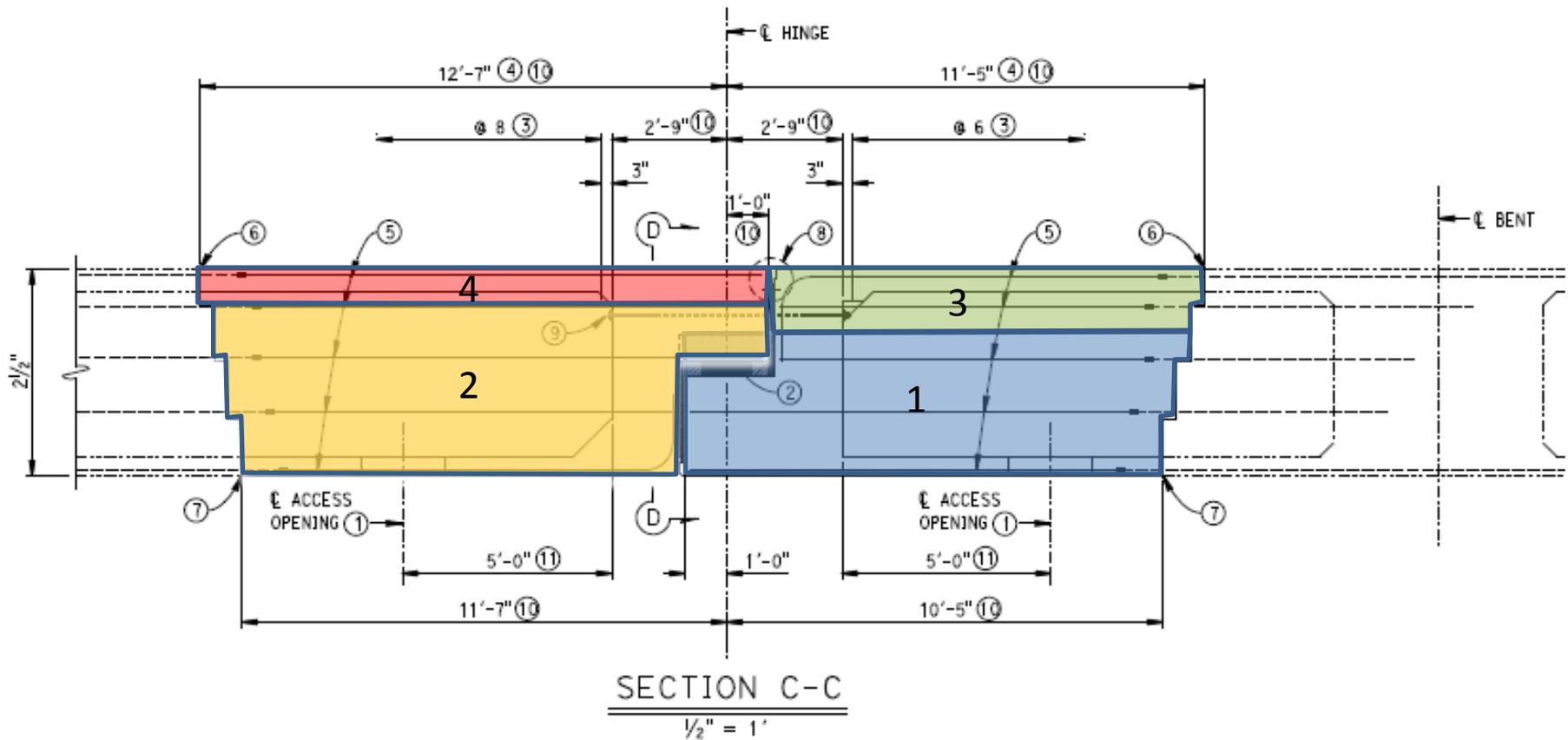




1. Concrete must achieve minimum compressive strength of 1,200 PSI prior to subsequent concrete placement
2. Deck must achieve minimum compressive strength of 3,250 PSI prior to opening to traffic



1. Concrete must achieve minimum compressive strength of 1,200 PSI prior to subsequent concrete placement
2. Deck must achieve minimum compressive strength of 3,250 PSI prior to opening to traffic



104 Hours Long Weekend Closures

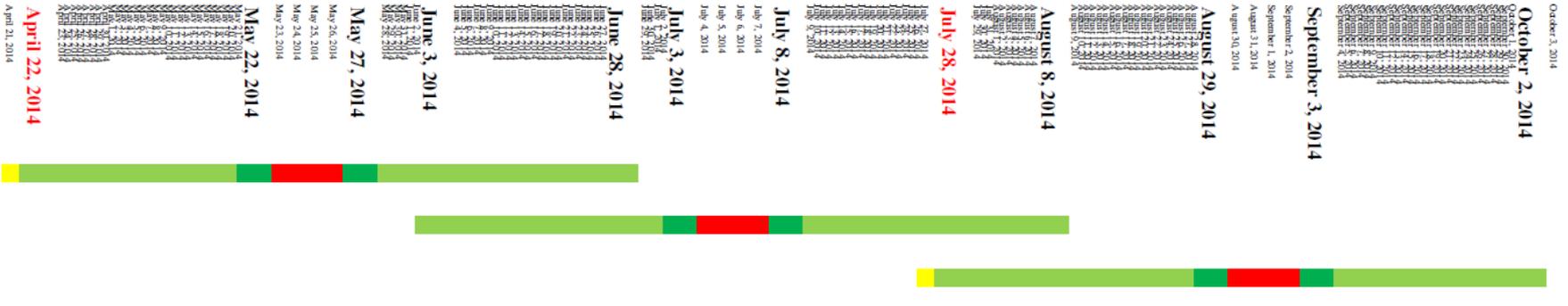
- Memorial Day Weekend (Monday, May 26)
 - 9 PM, Thursday, 05/22/14, through 5 AM, Tuesday, 05/27/14
(Southbound only)
- Independence Day Weekend (Friday, July 4)
 - 9 PM, Thursday, 07/03/14, through 5 AM, Tuesday, 07/08/14
(Northbound only)
- Labor Day Weekend (Monday, September 1)
 - 9 PM, Thursday, 08/28/14, through 5 AM, Tuesday, 09/02/14
(Northbound only)

Pre-Long Weekend Closure

Preparation/Demobilization - 4 wks/ea

- Prep each bay of the superstructure for demolition
 - Mounting saws to cut girders
 - Temporary supports within the structure to transfer falsework/temporary support load safely to prevent structural damage
- Prepare/level ground for falsework / temporary support erection
- Erect falsework on both side of the hinge
- Erect temporary support on the other side of the short span column and preload the supports to specified loads to prevent hinge curl-up
- Install dirt pad on the ground for demolition
- Pre-fabricate soffit, lost deck, hinge, girder forms and supports.
- Pre-fabricate hinge steel cages (Reinforcing Steel Cages)

Time Line



Impacts

- Traveling Public
- Nearby Residents
- Businesses

DETOUR

Via:

- Continue on **3rd St**
- Turn LEFT onto **Harrison St**
- Take **Westbound SF-80 On-ramp**
- Continue on **Southbound SF-101**
- Reach **Southbound SF-280**

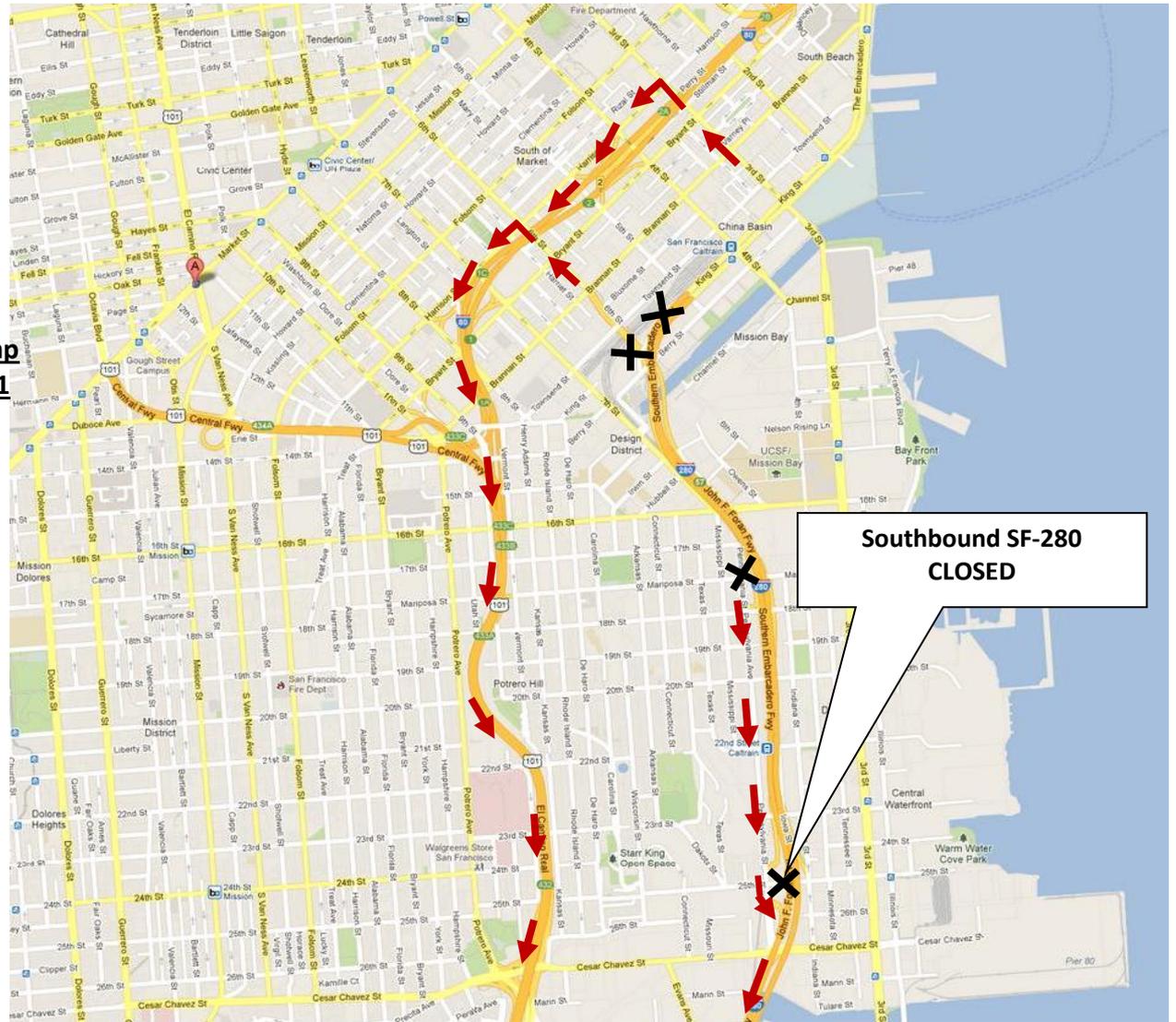
Or

- Continue on **6th St**
- Turn LEFT onto **Harrison St**
- Take Westbound SF-80 On-ramp
- Continue on Southbound SF-101
- Reach Southbound SF-280

Or

- Continue toward Southbound **Pennsylvania Ave**

- Continue on Southbound Pennsylvania Ave, Take Southbound SF-280 On-ramp



DETOUR

Via:

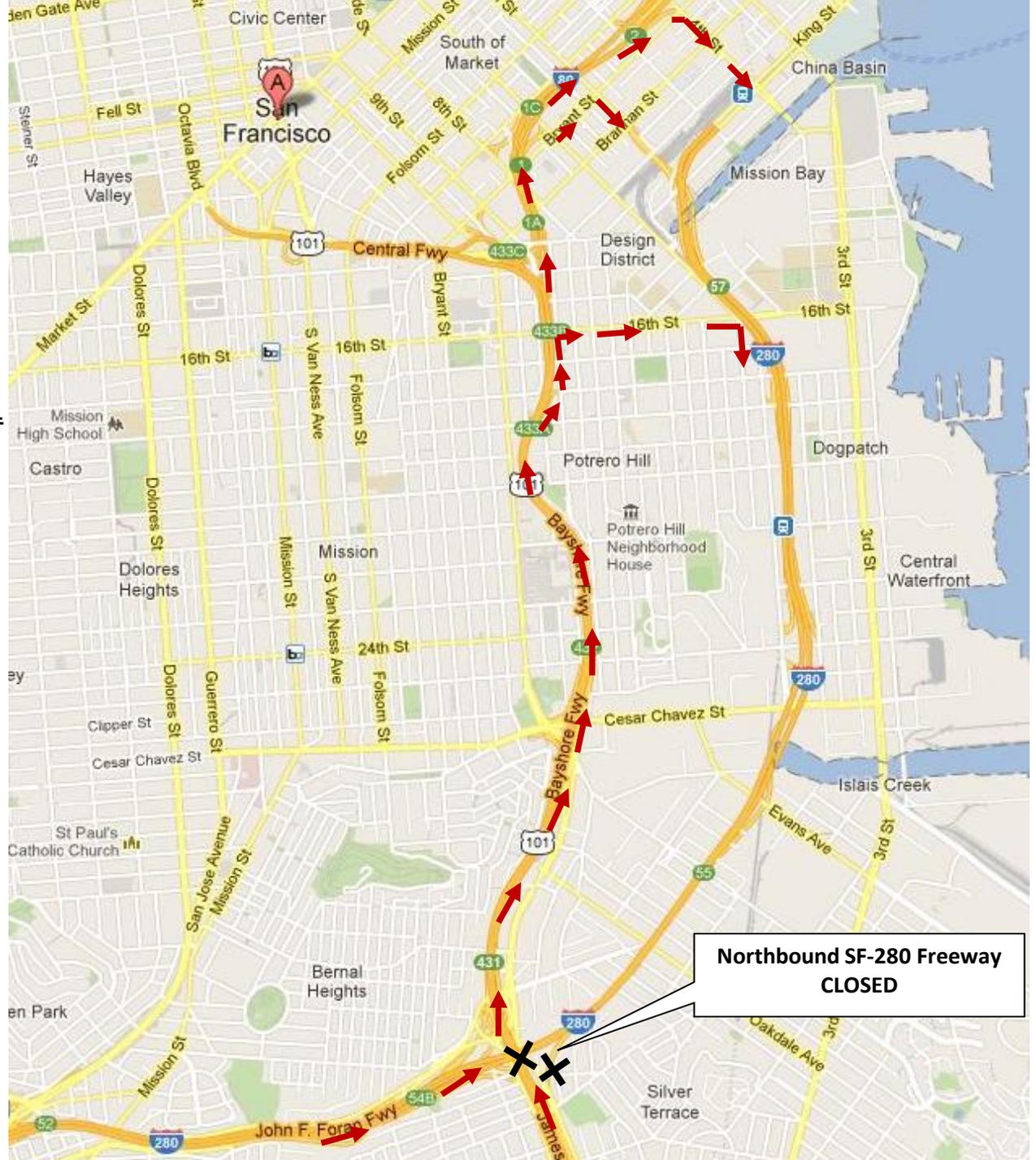
Continue on **Northbound SF-101**
Connector
Take Vermont St off-ramp
Continue on Vermont St
Turn **RIGHT** onto **16th St**
Turn **RIGHT** onto Mississippi St
Arrive at Mariposa St

Or

Continue on Northbound SF-101
Take 7th St off-ramp
Continue on Bryant St
Arrive at **6th St**

Or

Take 4th St off-ramp
Continue on Eastbound **4th St**
Arrive at **King St**

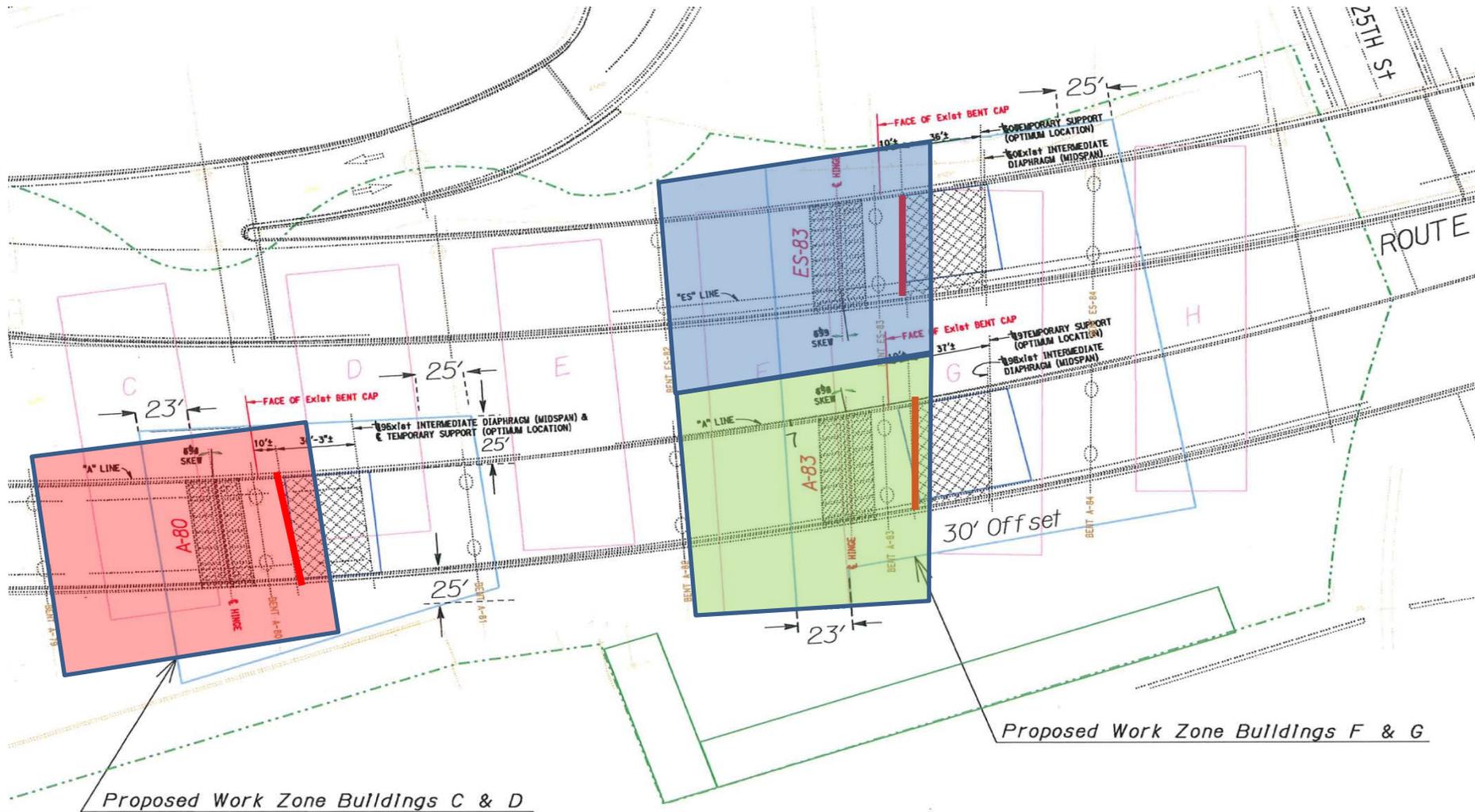




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Google Earth

Impacts to Army Street Mini Storage



Coordination

- Additional review of TMP being performed by SF MTA
- Chief Ken Lombardi of City Fire Department Support Services was contacted
- Lieutenant Juan Daniels of City Police Department Central Communications was contacted
- Yoyo Chen, Supervisor Malia Cohen's Legislative Aide, was contacted. A briefing will be scheduled for Supervisor Cohen, if requested. SF DPW and SF MTA will accompany Caltrans for the briefing.
- Dana Ketcham of SF Recreation and Parks was contacted
- Paul Oversier, BART Assistant General Manager of Operation, was contacted and I was refer to work with Service Planning Manager Jay Bolcik for possible service capacity increase during freeway closures.
- Keith Stahnke of SF Bay Ferry Planning was contacted
- Caltrans Public Information Officer is planning an extensive outreach to traveling public, SF Giants, merchants association and nearby residents.

Questions?