ROSE CREEK WATERSHED

HYDROLOGIC, HYDRAULIC, SEDIMENT TRANSPORT, AND GEOMORPHIC ANALYSES

TASK 4 – DATA GAPS PROGRAM

BACKGROUND

The Rose Creek Watershed (RCW) consists of three planning basins, Rose Canyon, San Clemente Canyon, and Lower Rose Creek, which all flow into the northeast corner of Mission Bay (Figure 1). The Hydrologic, Hydraulic, Sediment Transport, and Geomorphic Analyses (RCW Analysis) is being conducted to build upon the previously completed RCW Opportunities Assessment (Assessment) and associated technical memorandums. The purpose of Task 4 of the RCW Analysis was to develop a program (Data Gaps Program) to fill data gaps identified under Task 3 (Data Gap Summary Report). The Data Gaps Program was limited to filling only those data gaps needed to complete the development of the hydrologic, hydraulic, sediment transport, and geomorphic analysis tools that will be used to perform large-scale planning analyses of the RCW.

DATA GAPS PROGRAM

The Data Gaps Program included desktop research and a field survey to collect the data and information needed to fill the data gaps identified under Task 3 (Data Gap Summary Report). The desktop research consisted of performing web searches and contacting additional agency staff to obtain relevant information and data. The field survey was performed to obtain stream parameters and hydromodification information. A summary of the Data Gaps Program is presented in Table 1, which contains information on the objective, collection methodology, and analysis methodology to fill each data gap.

Under Task 3, continuous, long term meteorological data were identified as a data gap that needs to be filled to conduct the hydrologic analysis. To fill this data gap, meteorological data were obtained from the NOAA monitoring location in closest proximity to the RCW.

Under Task 3, numerous data gaps related to creek channel, concrete channel, culvert, bridge, and other structure dimensions were identified that needs to be filled to conduct the hydraulic analysis. To fill these data gaps, an approach utilizing the same collection methodology was developed and implemented as follows. Research was conducted to obtain higher resolution topographic data. Data for hydromodifications were obtained from detailed review of documents previously obtained under Task 1 (Existing Data Summary). Two field surveys were conducted to verify the information obtained from this detailed document review and to measure additional stream parameters (e.g., stream slope and stream width) in cases where such data were lacking. The first survey was conducted on June 7, 2007 and the second was conducted on June 12, 2007.

Under Task 3, lack of data regarding the sediment grain size distribution within the RCW was identified as a data gap that needs to be filled to conduct the sediment transport analysis. During the field surveys conducted on June 7, 2007 and June 12, 2007, the consistency of the sediments in the creek bed east of Interstate 805 (I-805) was compared with field observations conducted under Task 2 to identify any changes.

Under Task 3, lack of aerial photographic documentation throughout the upper portion of the RCW was identified as a data gap that needs to be filled to conduct the geomorphic analysis. This data gap was filled by researching and obtaining aerial photos from other sources throughout the area. The research effort was focused on the time period prior to channelization of Lower Rose Creek.

Table 1 – Data Gaps Program

DATA GAP	OBJECTIVE	COLLECTION METHODOLOGY	ANALYSIS METHODOLOGY
Meteorological data	Obtain long-term meteorological data in proximity to the RCW for the hydrologic analysis.	1. Identify closest meteorological station. 2. Download data from website.	Convert data to an acceptable format.
Creek channel dimensions Concrete channel dimensions Culvert dimensions Bridge dimensions Other structures	Obtain creek channel, culvert, bridge, and other structure dimensions for the hydraulic analysis.	1. Search for high resolution topographic data. 2. Extract cross section data from prior studies. 3. Conduct field survey to verify information. 4. Conduct field survey to measure dimensions.	Calculate dimensions based on field measurements.
Sediment grain size distributions	Obtain sediment grain size distributions along stream for the sediment transport analysis.	1. Determine consistency of creek bed sediment in the upper watershed (east of I-805) with available data. 2. If sediment is not consistent, obtain sediment samples for grain size analysis.	If necessary, process sediment sample lab data for grain size distribution.
Aerial photos	Obtain aerial photos of the upper watershed (east of I-805) for the geomorphic analysis.	1. Research additional aerial photos. 2. Purchase or download aerial photos.	Convert aerial photos to electronic format.

COLLECTED DATA SUMMARY

The closest meteorological monitoring location with the appropriate data was at San Diego Airport (CA7740), which is monitored under the National Climatic Data Centers (NCDC). Data between January 1, 1970 and December 31, 1995 were readily available and included hourly records for precipitation, evaporation, air temperature, wind speed, solar radiation, potential evapotranspiration, dewpoint temperature, and cloud cover. Daily records included maximum temperature, minimum temperature, wind speed, cloud cover, dewpoint temperature, and evaporation.

The field survey was conducted on June 7, 2007 and June 12, 2007. On June 7, 2007, the day was sunny with a high of 68°F. Winds were about 9 mph (SSW) and visibility was 10 miles. Field measurements were made along Rose Creek and San Clemente Creek west of I-805. The June 12, 2007 site visit was coordinated with the MCAS Miramar Environmental Management Department with assistance by KTU+A to access the MCAS Miramar. On June 12, 2007, the day was sunny with a high of 69°F. Winds were about 6 mph (West) and visibility was 9 miles.

Measurements of creek channel, concrete channel, culvert, bridge, and other structure dimensions were taken at various locations as shown in Figure 2. The locations of the field measurements are listed in Table 2. Distance measurement instruments included a handheld sonic measuring tool, Sonin Multi-Measure Combo Pro, and steel measuring tape. Slope measurements were made using a handheld level and angle measuring scope (Sokkia No. 8047-55). An Earthmate GPS PN-20 with Wide Area Augmentation System (WAAS) and mapping capability was used to map the locations of the measurements. Photos and measurements taken during the field survey are shown in Figures 3 -10. Each of these photos includes an insert of the watershed map with a red dot on the map identifying the location where the picture was taken.

Creek channel measurements along Rose Creek and San Clemente Creek are shown in Figures 3 and 4, respectively. Creek and concrete channel dimensions of width and side slopes were used to define the creek cross-sections. In general, the creek channel east of I-805 was shallow and narrow while to the west of I-805 the creek channel became wider.

The concrete channel measurements along Rose Creek are shown in Figure 5. Measurements of concrete channel dimensions of width and side slopes were made at the four concrete channel sections.

Culvert measurements along Rose Creek are shown in Figure 6 and culvert measurements along San Clemente Creek are shown in Figure 7. All culverts were located within MCAS Miramar. Culvert dimensions included shape and width.

Table 2 – Field Measurement Locations

PLANNING BASIN	MEASUREMENT TYPE	LANDMARK	LATITUDE	LONGITUDE
Rose Canyon	Observation	Interstate 15	32.881450891	117.106777310
	Culvert	Interstate 15	32.879156113	117.107218504
	Culvert		32.880052209	117.114939094
	Culvert	Kearny Villa Rd	32.879921079	117.116083860
	Culvert	Mitscher Way	32.880007505	117.130594611
	Culvert	Schilt Ave	32.880096912	117.135642290
	Culvert	Obregon Ave	32.879832864	117.141664743
	Creek channel	Pless Rd	32.877641797	117.153265953
	Culvert	Pless Rd	32.877638936	117.153314590
	Observation	Fish Pond	32.872710347	117.164788723
	Observation	Interstate 805	32.863623261	117.191254139
	Creek channel	Regents Rd	32.856840611	117.220282555
	Observation	Tributary	32.853395939	117.228741050
	Bridge	Pedestrian Bridge	32.852861404	117.229809046
	Observation	La Jolla Tributary	32.847158194	117.233843327
	Creek channel		32.845808864	117.234755397
	Concrete channel	Interstate 5	32.841669798	117.235071659
	Observation	Tributary confluence	32.839402556	117.233683467
	Observation	Tributary	32.839400291	117.231663704
	Concrete channel	State Route 52	32.837621331	117.232790232
San Clemente Canyon	Creek channel	Aqueduct	32.873866081	117.095806241
	Culvert	Interstate 15	32.872450233	117.106176853
	Bridge	Kearny Villa Rd	32.869121313	117.116184115
	Culvert		32.868606380	117.11711492
	Culvert	Convoy St	32.850774646	117.151694894
	Creek channel	Interstate 805	32.847189665	117.178547740
	Observation	Cobb	32.845194697	117.192354202
	Observation		32.844478488	117.194613457
	Bridge	Genesee Ave	32.845149994	117.200654745
	Observation		32.845709682	117.201770782
	Creek channel		32.845336795	117.206191182
	Creek channel		32.842511535	117.213331342
	Bridge	Regents Rd	32.840825319	117.217097402
	Observation	Parking lot	32.839588881	117.220025778
	Creek channel		32.839045048	117.221932650
	Observation	Rock protection	32.838371873	117.229291677
	Creek channel	Near confluence	32.837778807	117.231506705
	Creek channel	Confluence	32.837421298	117.231875777
Lower Rose Creek	Bridge and concrete channel	Railroad near Jutland Dr	32.822789669	117.228286147
	Bridges and concrete weir	Santa Fe Ave	32.816784150	117.22247151
	Bridge	Interstate 5	32.809857488	117.219180107
	Concrete channel, flow training vanes, and bridge	Mission Bay Dr	32.809333700	117.21895020
	Bridge	Garnet Ave	32.806074858	117.222015738
	Observation	Near Garnet Ave	32.805084705	117.222529054
	Bridge and observation	Near Grand Ave	32.802436471	117.222204804

Bridge measurements are shown in Figures 8 and 9 for Rose Creek and San Clemente Creek, respectively. Bridge dimensions measured included width, number of piers, and length.

Measurements of the other structures along Rose Creek are shown in Figure 10. The structures were a concrete weir and flow training vanes.

Additional topographic data were obtained from the MCAS Environmental Management Department for 2003 with a two-foot contour interval. Topographic data for localized areas of Rose Creek and San Clemente Creek were provided by KTU+A. One-foot contours (May 10, 2005) were provided for a portion of Rose Creek between Regents Road and I-5. Along San Clemente Creek, one-foot contours (April 13, 2006) were provided for a portion of the creek between I-805 and Genesee Avenue and a portion of creek between Genesee Avenue and Regents Road.

Additional aerial photos were obtained from the Fairchild Aerial Photography Collection. Photos were selected based on the date of photo, resolution, and coverage of the RCW. The years of the photographs obtained to fill the identified data gaps were 1941, 1955, 1958, and 1988.

SUMMARY

The large-scale planning phase data gaps identified under Task 3 were successfully filled with the Data Gaps Program. These data, along with the data obtained under Task 1, will provide sufficient data to complete the RCW Analysis. However, additional data will be needed to conduct more detailed studies within the RCW in the future, including the implementation of various restoration projects.

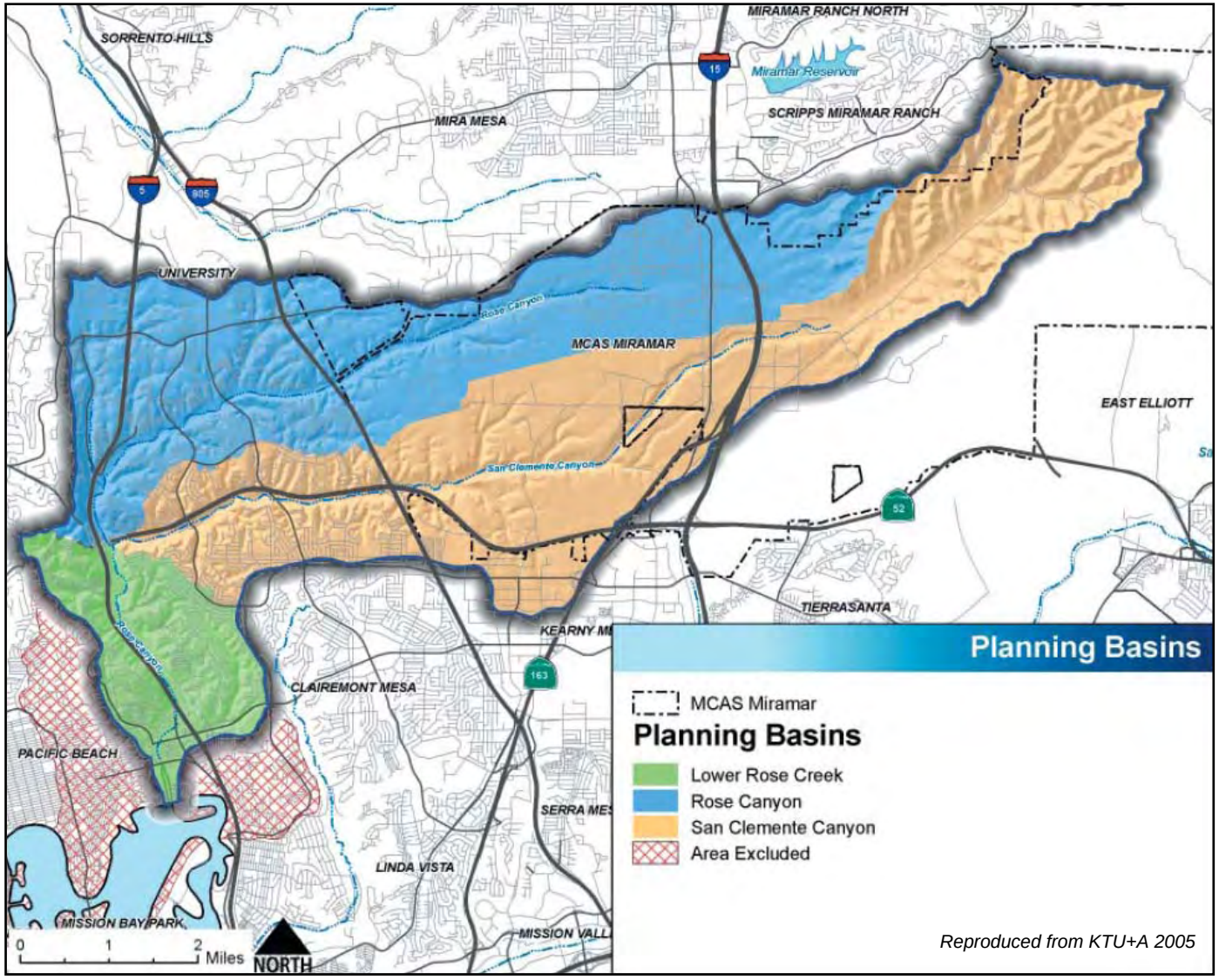


Figure 1 – Rose Creek Watershed

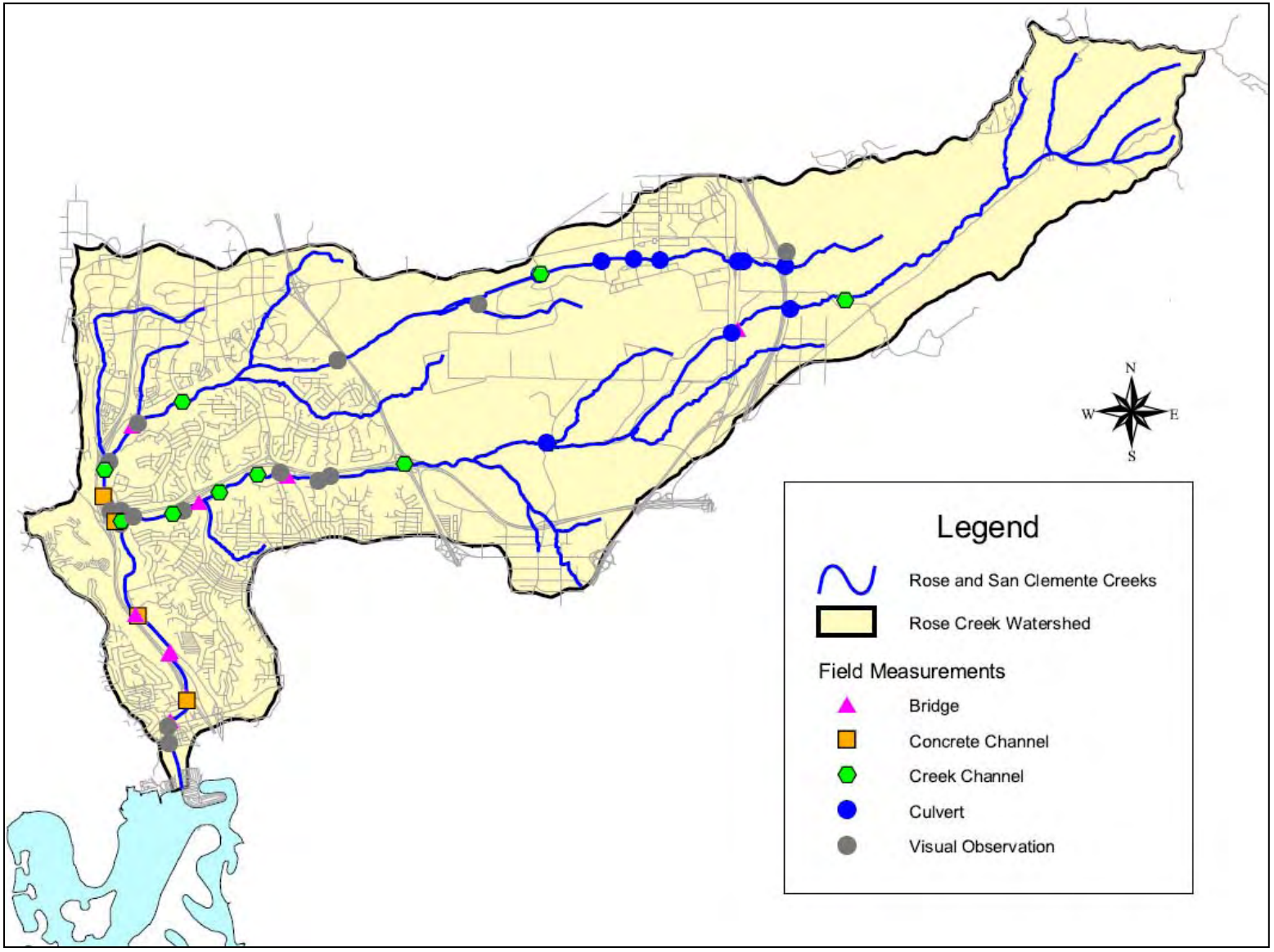


Figure 2 – Field Measurements

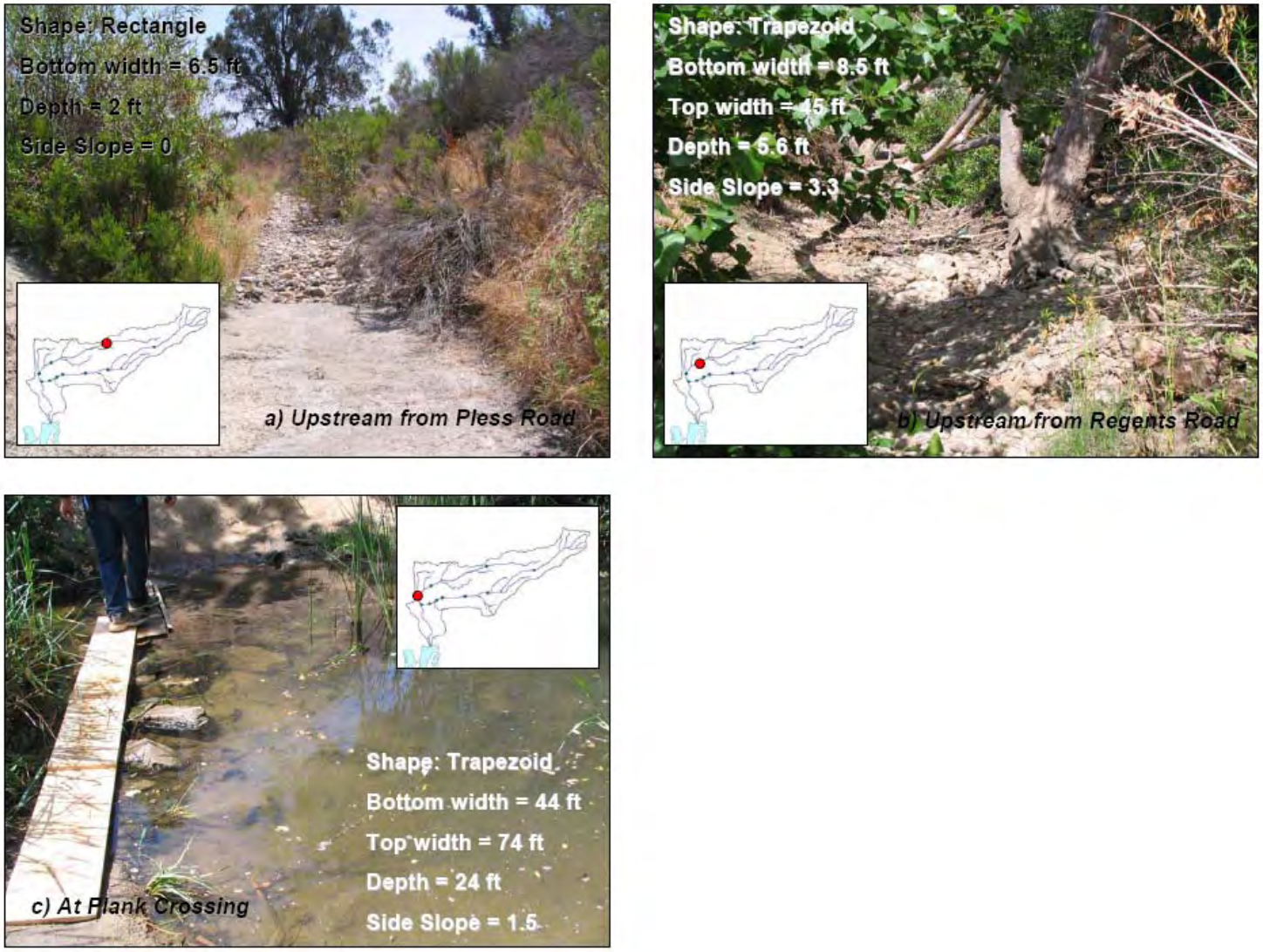


Figure 3 – Creek Channel Measurements along Rose Creek

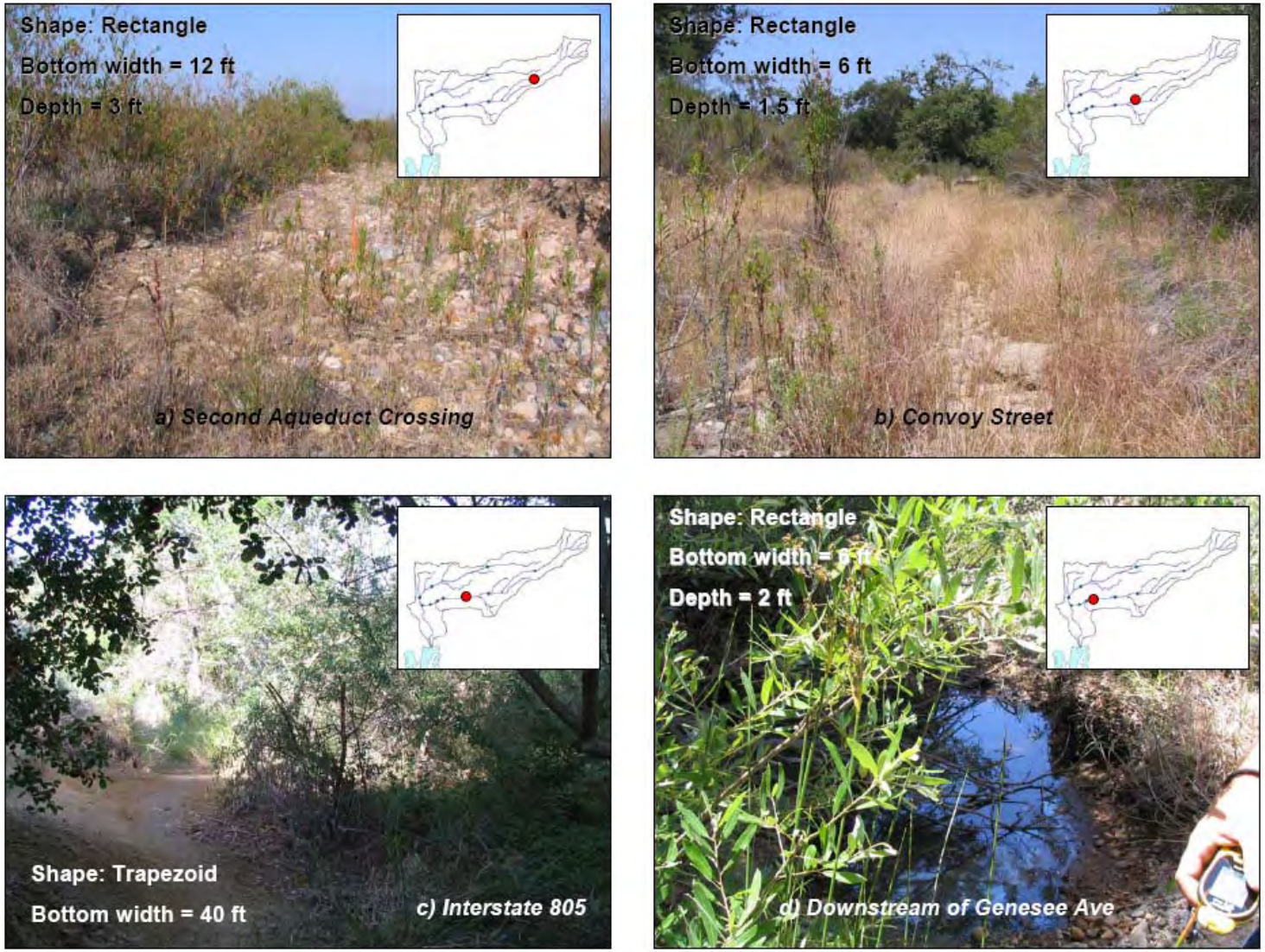


Figure 4 – Creek Channel Measurements along San Clemente Creek

Figure 4 (cont'd) – Creek Channel Measurements along San Clemente Creek

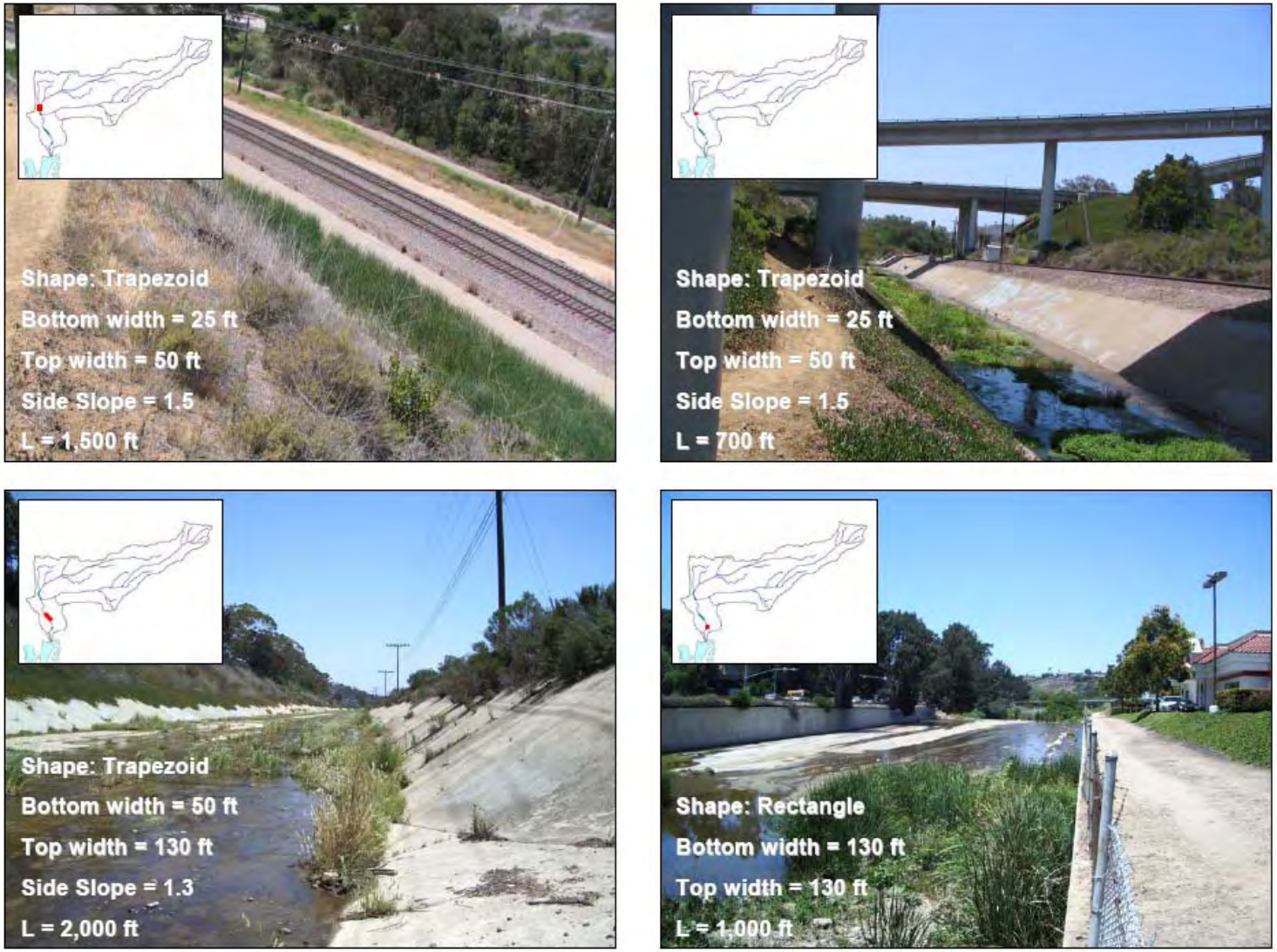


Figure 5 – Concrete Channel Measurements along Rose Creek

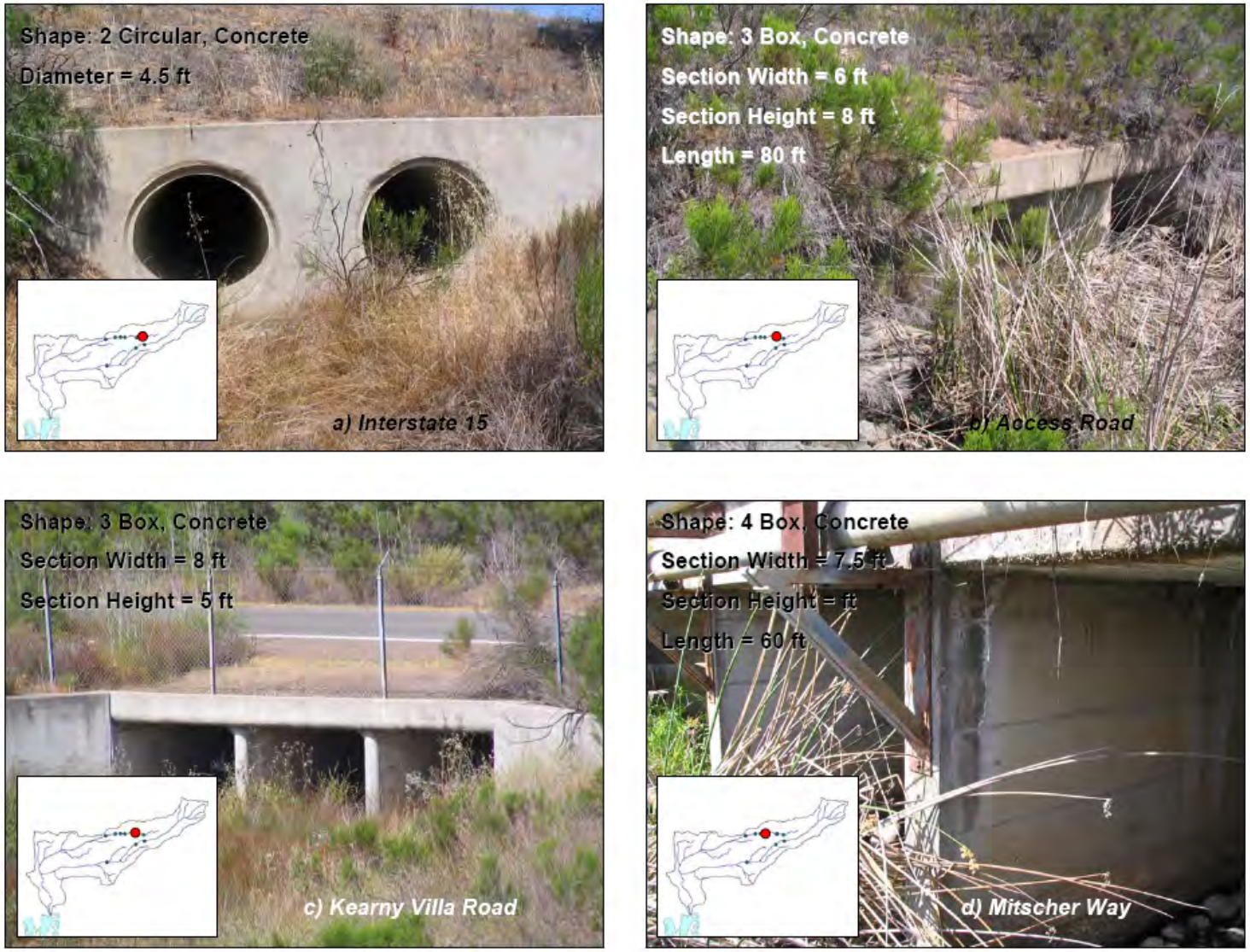
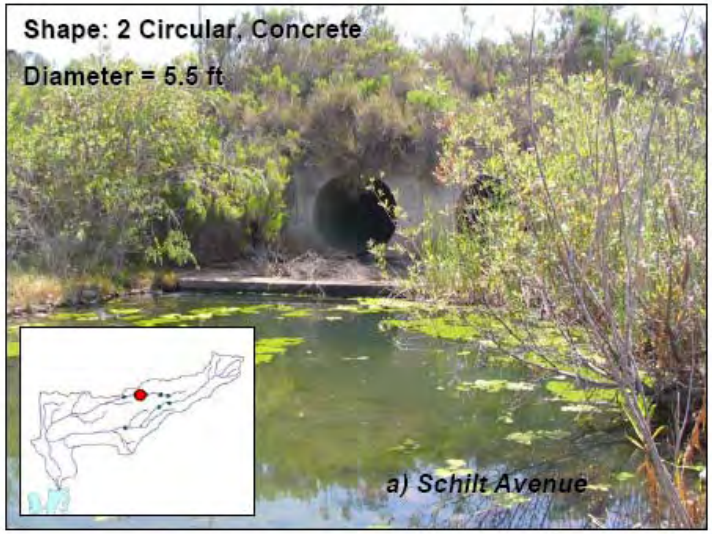


Figure 6 – Culvert Measurements along Rose Creek



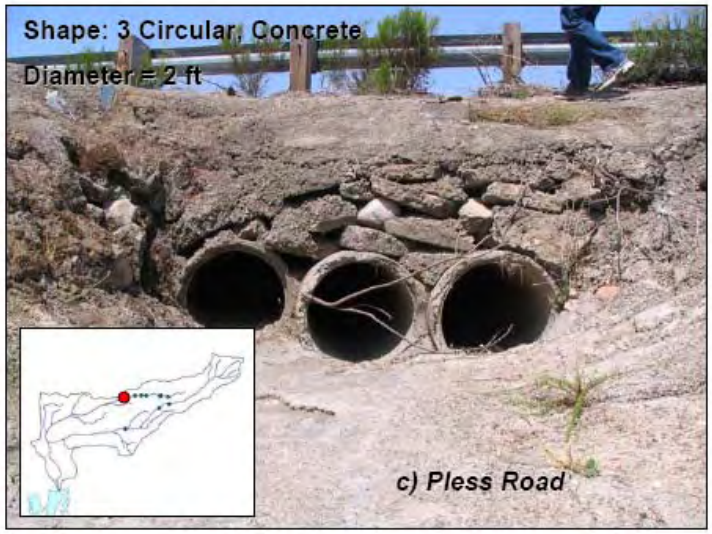
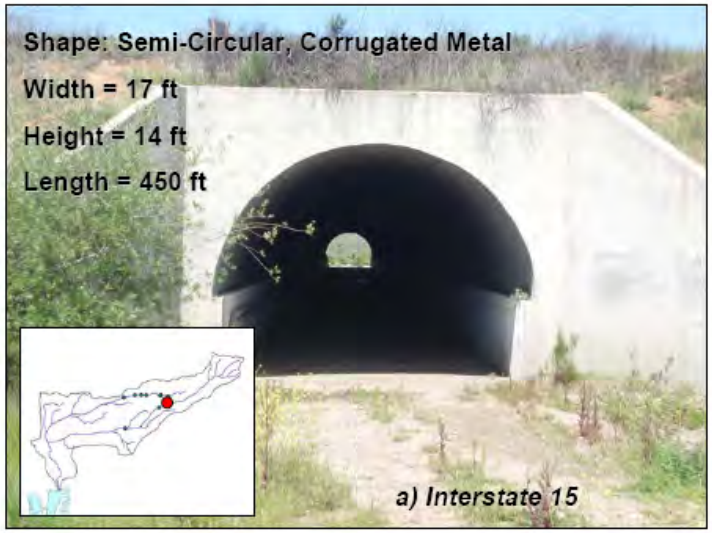


Figure 6 (cont'd) – Culvert Measurements along Rose Creek



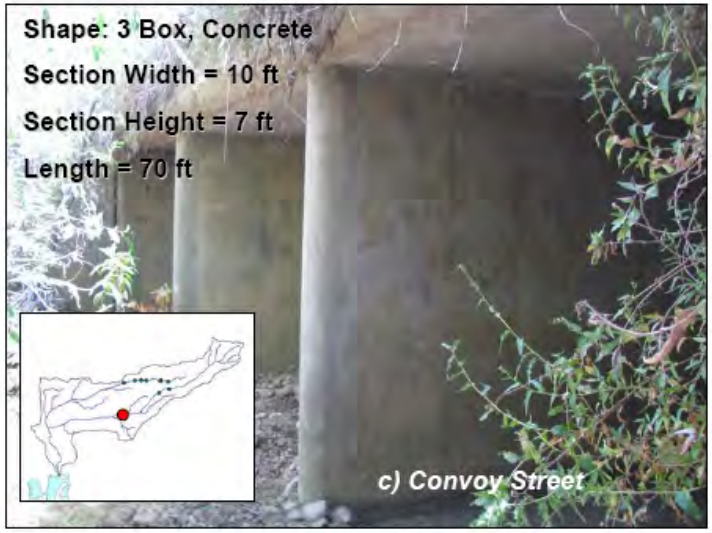


Figure 7 – Culvert Measurements along San Clemente Creek

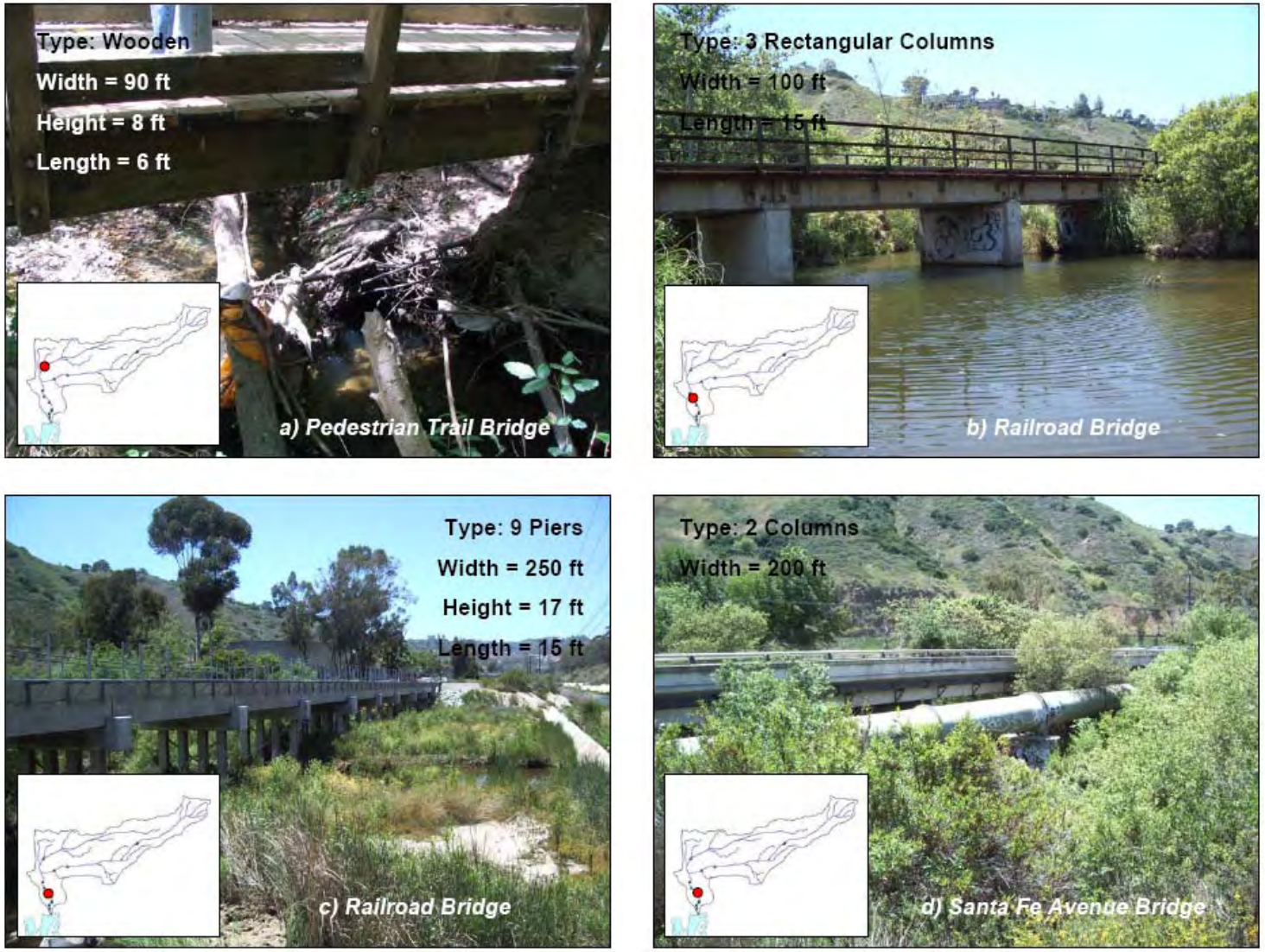
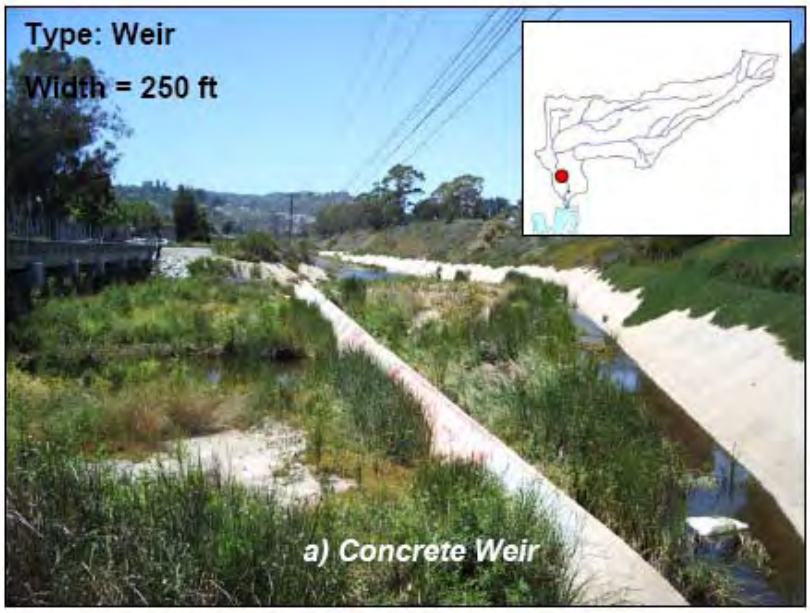


Figure 8 – Bridge Measurements along Rose Creek

Figure 8 (cont'd) – Bridge Measurements along Rose Creek

Figure 9 – Bridge Measurements along San Clemente Creek



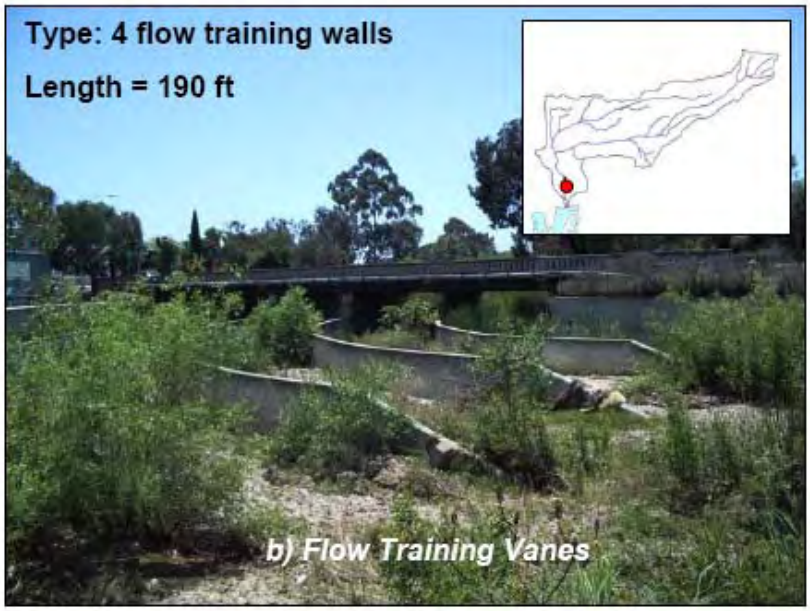


Figure 10 – Other Structure Measurements along Rose Creek