APPENDIX J

Master Storm Drain Study

DRAINAGE STUDY

McKINLEY VILLAGE

City of Sacramento, California

Prepared for:

Encore McKinley Village, LLC

September 2013

WOOD RODGERS

DEVELOPING INNOVATIVE DESIGN SOLUTIONS

Administrative Draft

Drainage Study
for

McKinley Village

Prepared for:

Encore McKinley Village, LLC

August 2013

Prepared by:

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg. 100-B Tel: 916.341.7760
Sacramento, CA 95816 Fax: 916.341.7767

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

I. INTRODUCTION AND PURPOSE

McKinley Village is a proposed single family residential development (**Figure 1**) located within the city of Sacramento (City), and bounded to the north by the Interstate Highway 80 Business Loop (Business 80) and to the south by the Union Pacific Railroad (UPRR) (formerly the Southern Pacific Railroad lines). Wood Rodgers, Inc. (Wood Rodgers) has prepared this drainage study on behalf of Encore McKinley Village, LLC.

The purpose of this report is to present a hydrologic and hydraulic analysis for the proposed McKinley Village on-site drainage system while minimizing the impact to the existing off-site drainage system and discharge into the American River. The proposed storm-drainage system includes an on-site drainage pipe network, Low Impact Design/Hydro-modification (LID/H-M) facilities which encourage reduced runoff, detention basins and an on-site pump station to control flows to the city of Sacramento Sump 99.

II. BACKGROUND

The proposed land use plan for McKinley Village development consists of 48.8± acres, which encompasses parks, open space lots, and single family residential lots. The McKinley Village project is isolated from the existing City of Sacramento drainage system by Business 80 and the UPRR embankment. Contribution of storm runoff from adjacent UPRR and City of Sacramento land will increase the area of the total on-site watershed to 60.6± acres.

III. FLOOD CONTROL

Effective FEMA FIRM

FEMA prepared an updated FIRM, dated August 16, 2012. The project area is not within a 100-year floodplain and the location is identified as within a 500-year floodplain Zone X (protected by levee from the one-percent annual chance of flood). (**Figure 2**)

Proposed Flood Control Facilities

The McKinley Village project includes the proposed 40th Street extension underpass through the existing UPRR that will connect to C Street. The UPRR embankment located south of the American River is considered a secondary flood control facility protecting portions of Sacramento from an American River left bank levee failure east of the McKinley Village project.

The existing UPRR top-of-levee elevation is approximately El. 40.0 feet National Geodetic Vertical Datum of 1929 (NGVD 29) which is consistent with the left bank of the American River top-of-levee. As identified in the 1998 Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the estimated 100-year Base Flood Elevations (BFEs) with the levees assumed as a failed condition (performed by others) falls in elevation from an eastern to a western direction towards the McKinley Village project. The overbank FEMA FIRM elevations are assumed to be contained between the UPRR embankment and the American River left bank levee. The 100-year overbank elevation within the project boundary is El. 37.0 feet (NGVD 29). **Figure 3** shows the overbank elevations from the hypothetical levee failure prior to the American River levee certification in 2004. The proposed 40th Street extension underpass through the UPRR embankment will include a floodgate structure on the north side of the UPRR embankment. The floodgate structure will prevent flood water from entering the underpass and provide the same secondary flood control protection as the existing UPRR embankment from a potential failure on the American River south levee located east of the McKinley Village project.

The basis for setting the top-of-gate elevation is based on the elevation of the existing flood gate structure located on Business 80 and the FEMA FIRM elevation dated 1998. The updated effective FEMA FIRM dated 2012 does not show the overbank BFEs because the American River levees were approved for FEMA certification in 2004. The BFEs that were removed from the overbank south of the American River were replaced by a FEMA Shaded Zone X designation. Shaded Zone X represents an area protected by a certified levee.

IV. EXISTING AND PROPOSED TOPOGRAPHY

The existing topography for the McKinley Village site varies in elevation from El. 28.0 feet at the east to El. 14.0 feet at the west. The existing topographic data collected by Wood Rodgers and presented on the proposed grading plan (**Appendix A**) is based on the city of Sacramento benchmark 297-G4F. The city of Sacramento controlling elevation for 297-C3E is published as 29.383 feet, whereas NGS published a NGVD 29 elevation of 29.0 feet (NAVD 88 elevation of 31.55 feet)

Note: The elevations, as presented in this report, are city of Sacramento datum (City Datum), unless otherwise specified.

Existing Land Use and Facilities

The majority of the project area is undeveloped open space, McKinley Village project land, the existing A Street overcrossing (city of Sacramento land), and the north half of the UPRR

embankment. The existing Business 80 and UPRR embankment prevent drainage runoff from leaving the site; therefore, there is an overland release for this site.

The existing runoff from this land collects on-site and does not contribute to any off-site existing drainage system. The existing runoff ponds on-site and drains through infiltration, and evaporates.

Adjacent to McKinley Village, the existing off-site drainage system located south of the UPRR utilizes Sump 99. A more detailed description of the Sump 99 is given in **Section V**. The residential gravity drainage system to Sump 99 includes three trunk systems along C Street, Meister Way and Elvas Avenue connected to Sump 99 by way of a 90-inch-diameter pipe located at the intersection of Lanatt Street and Elvas Avenue.

Proposed Facilities

The proposed McKinley Village project will incorporate an on-site underground drain pipe system that gravity flows from east to west across the site to an on-site 10.0 acre-feet drainage basin. An on-site pump station sump located on the west side of the property will include two 5-cfs pumps that will be connected to Sump 99 via an 18-inch-diameter force main. Since McKinley Village drainage is contained on-site and connected to Sump 99, the pump system was designed to shut off when peak stages occur in Sump 99 in order to minimize any impact to the off-site drainage system. To mitigate the storm water runoff when the pumps are shut off, McKinley Village includes two detention basins to contain peak runoff volume when the pumps are turned off.

V. OFF-SITE DRAINAGE SHEDS AND PUMP STATION (Sump 99)

The existing drainage system for Sump 99 and Sump 10 totals approximately 1,135.2 acres. The drainage sheds corresponding to these sumps are named as Basin 99 and Basin 10 respectively. The watershed area of Sump 99 is named Basin 99 and has a total watershed area of approximately 386 acres. The locations of these two sheds are shown on **Figure 4.**

The existing drainage pump station (City Sump 99) was built in 1966 and is located near the intersection of C Street/Elvas Avenue and Lanatt Street. Record drawings of Sump 99 were obtained from city of Sacramento Drainage Project No. 14 and provided on the DVD. Sump 99 includes an intake of a 90-inch reinforced concrete pipe and the outlet force main is a 66-inch welded steel pipe which extends approximately 1,700 feet through the River Park development to the outfall at American River.

The pump station contains a total of four pumps (description shown in **Table 1**, below). **Appendix B** provides the Sump 99 record drawings.

Table 1
Pump Parameters at the Sump 99

Pump Capacity (cfs)	Horse Power	Pump Start Elevation (feet)	Pump Stop Elevation (feet)
3.2	25	7.72	6.72
48.5	300	11.22	8.72
48.5	300	13.22	10.22
48.5	300	15.22	11.22

VI. DESIGN CRITERIA

The following design criteria were applied to the McKinley Village evaluation:

1. The 100-year Water Surface Elevation (WSEL) shall be a minimum of 12 inches below proposed pad elevations (Proposed Development).

2. The 100-year WSEL shall be below the finish floor elevation of any existing structure (Existing Development). Note: Wood Rodgers evaluated existing conditions without the proposed project connected to Sump 99 in order to determine if any existing structures do not satisfy these criteria.

3. The 10-year WSEL shall be a minimum of six inches below proposed adjacent gutter flow line elevations (Proposed Development).

4. The 10-year WSEL shall not exceed existing top-of-curb elevation (Existing Development). Note: Wood Rodgers evaluated existing conditions to determine if the existing top-of-curb elevations do not meet these criteria.

5. The maximum velocity in any gravity drain pipe shall not exceed 10 feet per second (fps).

VII. MODELLING SOFTWARE AND APPROACH

The existing off-site Sump 99 drainage system was originally modeled using the city of Sacramento Stormwater Management Model (SSWMM96). This original model includes two file blocks entitled RUNOFF and EXTRAN. The RUNOFF block watershed simulation is first

used to develop runoff hydrographs for each sub-catchment in the watershed. The RUNOFF block conveyance simulation may then be used to perform hydrologic routing through various conveyance elements. Finally, the EXTRAN block is used to dynamically route the hydrographs through the remainder of the conveyance system, usually the major interceptors and trunk lines.

Wood Rodgers proceeded with updated dynamic modeling XPSWMM Version 2012 software. XPSWMM analysis capabilities are very similar to the SSWMM96 software, but XPSWMM includes an enhanced graphical interface that makes it more user friendly.

The existing off-site drainage system parameters within Basin 99 watershed (Figure 4) was extracted from the SSWMM96 model and redeveloped in the XPSWMM model as the "Existing Condition". The output of off-site model results using these two software is then compared to get an overall confidence in the XPSWMM model.

The on-site Sacramento County hydrology was incorporated into XPSWMM which quantified the runoff contributions from each sub-shed based on the soil conditions, land use, and topography for different storm events. The hydraulic module of the XPSWMM model is used to route the flow hydrographs through the proposed the gravity flow network to the proposed on-site pump station. A proposed force main is connected from the on-site pump station to Sump 99 of the off-site XPSMM model network to evaluate a "Proposed Conditions".

VIII. HYDROLOGY

The following sections provide the hydrologic data used to evaluate the existing and proposed drainage system presented in this report.

Sub-Catchment of Basin 99

The layout of the existing sub-catchments and drainage network of Basin 99 is shown in **Appendix C**. The original SSWMM96 model inflow from sub-catchment 3001 was added to Node 300; however, adding this to Node 399 appears to be more reasonable. The hydrographs obtained in 18 sub-catchments from the RUNOFF block of SSWMM96 were applied to the corresponding nodes in the XPSWMM model as shown in **Table 2.**

Table 2 Existing Condition Network			
Sub-Catchment No.	**Width of Sub-Catchment (feet)**	**Area of Sub-Catchment (acre)**	**Network Sub-Catchment Connection Node from to Downstream Node Manhole**
9900	1241	14.2	99
3001	3326	30.9	399
3002	1238	10.4	300
3050	1788	8.9	305
3100	2942	21.2	310
3150	2282	18.9	315
3200	2435	13.3	320
3201	3914	18.5	320
3250	3636	45.6	325
3300	2464	22.2	330
3350	2260	17.0	335
3400	1775	10.1	340
3450	2444	13.4	345
3500	3150	32.1	350
3550	2070	24.6	355
3600	1426	21.1	360
3650	2366	24.0	365
3700	1725	37.9	370

Rainfall and Evaporation

The rainfall depths and temporal storm patterns applied to each sub-shed area was obtained from the City and County of Sacramento Drainage Manual (Volume 2: Hydrology Standards) December 1996. This study includes an evaluation using the design rainfall data for the 10-year 24-hour, 100-year 24-hour and 100-year 10-day storm events for Zone 2. Zone 2 from the Sacramento County manual encompasses the hydrologic area west of Highway 99 to Lake Natoma. This data is documented in **Appendix D**. The evaporation rate of 0.1 inch/day was assumed in XPSWMM model evaluation.

Sub-Catchment Properties

The proposed sub-catchment boundaries are shown in **Appendix F**. In accordance with the Sacramento SWMM manual, Sub-catchment width (W) was been estimated with the following equation: W = (A) / (L)

Where: A= Sub-catchment Area (square feet)

L= Typical Overland Flow Length, in this case flowpath in each sub-shed was obtained as the length of longest watercourse, measured as approximately 90 percent of the distance from the point of interest which is the catch basin inlet to the headwater divide of the basin.

The overall slope along the flow path is considered as the slope of the sub-shed.

Land Use

Sub-catchment imperviousness has been calculated in accordance with the proposed land use shown on the Tentative Map included in **Appendix E**, and the City's typical Land Use/Imperviousness criteria are provided in **Table 3**. The percentage imperviousness in each sub-shed was obtained from their weighted average area of each land use type. The proposed on-site T-court driveways are considered to have a percentage imperviousness of 90 percent.

Table 3
Typical Land Use/Imperviousness

Land Use	Impervious Percentage
Commercial/Highways/Parking	95%
Apartments/Offices/Trailers/Multi-Family	80%
Condominiums/Schools/Industry	70%
Single Family Residential: 11-18 DU/Acre	70%
Single Family Residential: 8-10 DU/Acre	60%
Single Family Residential: 6-8 DU/Acre	50%
Single Family Residential: 4-6 DU/Acre	40%
Single Family Residential: 3-4 DU/Acre	30%
Single Family Residential: 1-2 DU/Acre	15%
Single Family Residential: .2-.5 DU/Acre	10%

Table 3 Typical Land Use/Imperviousness	
Land Use	**Impervious Percentage**
Single Family Residential: <.2 DU/Acre	5%
Park	5%
Open Space/Grassland/Cropland	2%
Open Space/Woodland	1%

Overland Flow, Depression Storage, and Infiltration

Overland Flow roughness coefficients have been applied in accordance with the City's 1996 SWMM Manual, as shown in **Table 4**. The highlighted rows were incorporated into the XPSWMM model.

Table 4 Sub-Catchment Overflow and Flow Roughness Coefficients	
Ground Cover	**Suggested Manning's "n" for Overland Flow**
Impervious	
Smooth Asphalt	0.016
Asphalt or Concrete Paving	0.020
Pervious	
Native grass	0.20
Urban Lawns	0.25
Dense Shrubbery and forest liner	0.40

Depression storage is an assumed value included in the model evaluation to represent shallow depth which will store runoff on the rising or falling limb of the hydrograph. The values extracted from the Sacramento SWMM manual and included in the XPSWMM evaluation are shown below in **Table 5.** The highlighted rows were incorporated in both SSWMM96 and XPSWMM models.

Table 5 Typical Depression Storage for Various Land Covers		
Land Cover	**Typical Depression and Detention Storage Values (inches)**	**Recommended Storage Values (inches)**
Impervious Areas		
Large Paved Area	0.05-0.15	0.10
Roofs - Flat	0.10-0.30	0.10
Roofs - Sloped	0.05-0.10	0.05
Pervious Areas		
Lawn Grass	0.2-0.5	0.35
Wooded Areas and Open Fields	0.2-0.6	0.40

Soil Infiltration values were applied in accordance with the Sacramento SWMM manual, as provided in **Table 6**. The current soils classification for the site from the Natural Resources Conservation Service (NRCS), formerly SCS, and the entire on-site area is covered by Hydrologic Soil Group "A" soils at the time of the soils study. Hydrologic Soils Group A has a high rate of water transmission. A majority of areas throughout the City and County of Sacramento are included in Hydrologic Soils C and D which have a low rate of runoff. To be consistent with the infiltration rate used in the SSWMM96 model, Hydrologic Soil-Cover Group "B" was used in the analysis in both pre and post-project conditions of XPSWMM.

Initial losses are dependent on the soil condition. Horton's method was used to calculate the infiltration in both the on-site and off-site Sub-catchments. **Table 6** indicates the initial and final Hydrologic Soil Group B infiltration values used for the project. The highlighted row was incorporated in both SSWMM96 and XPSWMM models.

Table 6 Recommended Infiltration Coefficients			
Hydrologic Soil Group	**Initial Infiltration (inch/hour)**	**Final Infiltration (inch/hour)**	**Infiltration Decay Coefficient**
A	1.0	0.35	0.0007
B	1.0	0.19	0.0018
C	1.0	0.11	0.0018
D	1.0	0.08	0.0018

IX. HYDRAULICS: EXISTING CONDITIONS (Pre-Project)

The existing conditions (pre-project) hydraulic model has been analyzed to evaluate the existing drainage system and the Sump 99 pumping scheme, and to note any surcharge that potentially impacts the existing residential homes.

Existing Storm Drains

The SSWMM96 model includes both Basin 99 and Basin 10 with separate pump stations that discharge to the American River. The model input only included the main trunk storm drain pipes and excluded the intermediate leader pipes from the street inlets to the trunk system. The EXTRAN Block of SSWMM96 was used to calculate the hydraulics of the off-site drainage network of Basin 99 and Basin 10. Wood Rodgers identified two locations where Basin 10 overflows to Basin 99 and, eventually, to the outfall of Sump 99. The overflow occurs at the intersection of 49th Street and C Street (Node 1048), and at the intersection of Elvas Avenue and Aiken Way (Node 1031). The corresponding downstream pipes are 426 and 401 respectively. **Appendix C** shows the drainage network of Basin 99 and the overflow locations. **Table 7** provides the estimated runoff volume exchange from Basin 10 to Basin 99.

Table 7
Estimated Volume Exchange from Basin 10 to Basin 99

Overflow Location	100-year 24-hour Storm Event (acre-feet)	10-year 24-hour Storm Event (acre-feet)
Estimated Total Volume through Conduit 426	15.7	7.8
Estimated Total Volume through Conduit 401	13.4	8.4
Estimated Total Overflow Volume from Basin 10 to Basin 99	**29.1**	**16.2**

In order to confirm that SSWMM96 and XPSWMM models provide consistent output results, the existing off-site drain system from SSWMM96 was inserted into XPSWMM and compared. The hydrology fromSSWMM96 model for the off-site drainage was considered acceptable and was applied to the corresponding nodes in the XPSWMM model for consistency. Since, off-site

XPSWMM model was developed only for Basin 99, the routed overflow hydrographs from Basin 10 through conduits 426 and 401 were added to their corresponding upstream nodes in the XPSWMM model boundary conditions. The McKinley Village project area does not contribute runoff to Sump 99 in the existing condition. Instead, storm water runoff accumulates on-site because there is no connecting under drain(s) through the UPRR. Storm water currently ponds on-site and infiltrates.

Figure 5A and **Figure 5B** represent flow hydrographs through the 90-inch diameter conduit obtained using both SSWMM96 and XPSWMM models. **Figures 5A** and **5B** both reflect the pump operations required to discharge flow to the American River. The flow has been compared with the corresponding velocity and the stage at the upstream node 399. The flow hydrographs for the 100-year 24-hour storm event at the upstream 90-inch conduit (Pipe 498) indicates that both models produce similar and acceptable results for existing conditions. The oscillation in the flow hydrograph that occurs before and after the peak flow regime is mainly due to the fact that the bottoms 48.5 cfs pump turns on/off between elevation of 8.72 feet and 11.22 feet. **Table 8** presents the total volume into Sump 99 for the 10- and 100-year 24-hour storm events. The overflow from Basin 10, in the 100-year 24-hour and 10-year 24-hour storm events were estimated at 25 and 26 percent of the total runoff volume, respectively.

Table 8
Existing Condition Sump 99 Comparison

Storm Event	100-year 24-hour Storm Event		10-year 24-hour Storm Event	
	SSWMM96	XPSWMM	SSWMM96	XPSWMM
Total Flow at Sump 99 (acre-feet)	115.30	114.40	63.80	62.00
Total flow contributed by Basin 99 (Based on the over flow using SSWMM96 model) (acre-feet)	86.20	85.30	47.60	45.80
Total Flow volume in inches (from total area of 386 acres)	2.68	2.65	1.48	1.42
Total Rainfall (inches)	4.25	4.25	2.98	2.98
% of total effective rainfall reaches at Sump 99	63.00	62.00	50.00	48.00

Sump 99 Conditions

The resulting stages at Sump 99 for the 100-year 24-hour and 10-year 24-hour storm events were compared using both SSWMM96 and XPSWMM. **Figures 6A** and **6B** indicate that the resulting stage is similar when compared to both the SSWMM96 and XPSWMM model, the peak stages at the Sump 99 are slightly higher using XPSWMM compared to SSWMM96. Although the stages

are with tolerance, the XPSWMM model was determined to be acceptable and used to evaluate proposed conditions. This peak stage occurs for a very short duration of time and is considered negligible. A second peak occurs in the XPSWMM stage, and the pattern of the stage hydrograph at the peak period is relatively flat. There is a fluctuation in the stage that varies between 8.72 and 11.22 feet and occurs before and after the peak stage. This fluctuation is due to the on/off criteria of the bottom two pumps (see **Table 1** for pump parameters).

Table 9 provides a comparison of the stage and the duration of peak that occurred in Sump 99 using the two models.

Table 9
Estimated Model Comparisons at Sump 99

Storm Event	SSWMM96		XPSWMM	
	Peak Stage at Sump 99 (feet)	Duration above based El.13.0 feet (hours)	Peak Stage at Sump 99 (feet)	Duration above base El. 13.0 feet (hours)
100-year 24-hour	22.8	5.6	24.1	5.3
10-year 24-hour	21.4	1.5	22.7	1.6

X. HYDRAULICS: FUTURE CONDITIONS (Post-Project)

After determining that the off-site XPSWMM model is comparing well with the existing SSWMM96 model, the on-site hydrology and drainage network is developed using XPSWMM and incorporated in the off-site model. Wood Rodgers evaluated the hydraulic performance of the Basin 99 drainage system for the 100-year and 10-year 24-hour duration storms to ensure protection of structures from flood damage and to confirm that the existing drainage system is not impacted. Additionally, the 100-year 10-day storm event was evaluated. All stormwater infiltrated on-site was not conveyed downstream and does not enter the Sump 99 downstream system. The hydrologic parameters used in the on-site model are described earlier in the **Section VIII**.

Pipe Material, Roughness Coefficient, and Minimum Pipe Slope

Pipes have been modeled with the following pipe material described in the improvement standards. The proposed pipes are considered as reinforced concrete pipes. The Manning's roughness coefficient ("n" value) of 0.015 is applied in all gravity pipes. The force main was assumed PVC material with a Manning's n = 0.011.

The use of this "n" value allowed for the use of varying pipe slope to achieve the minimum self-cleaning. A minimum self-cleaning velocity of two fps was assumed for full flow conditions.

XPSWMM Model – Conduit and Parallel Overland Channel Relationship

For reference, the application of the overland (street) cross-sections corresponding in tandem with the parallel subsurface conduit in the XPSWMM modeling was described in **Appendix G**. Street cross-sections having a typical right-of-way width for a 42, 53, 58 and 59 feet were defined in the model to accommodate overall street storage for storm water runoff. The model incorporated typical residential street high and low points in the overland flow geometry. To assist in the review of reflecting depressed areas that contribute to peak flow attenuation, the streets are modeled as two separate flow lines connected in series.

On-site Drainage Layout

The proposed preliminary on-site storm drain pipe layout was designed using the above mentioned criteria. The runoff is directed from three major branches meeting at the intersection of proposed A Street and Street 2. The drain pipe size, flow and HGL at each node under 100-year 24-hour and 10-year 24-hour storm events for the entire on-site drainage network are shown in **Appendix F.**

Simulation at 100-Year 10-Day Storm Event

In addition to the 100-year 24-hour evaluation, the XPSWMM model was run for the 100-year 10-day storm event. The rainfall data was synthesized from the City and County of Sacramento Drainage Manual; Volume 2: Hydrology Standards, December 1996. The rainfall data is given in **Appendix D.**

Basin Design

In order to mitigate the peak flow from the developed lands of the project area, two detention basins are proposed at the western boundary of the project where the proposed elevation is the lowest on the project site. The detention basin location at the lowest elevation will facilitate overland release on-site from east to west to provide the maximum protection and to prevent structure flooding. These detention basins are named DETS and DETN in the XPSWMM model. DETS is located between A Street and the UPRR, and DETN is located between A Street and Business 80. These basins will have varying side slopes of from 3:1 to 5:1. The location and topography of these detention basins are shown in **Appendix H**.

Two basins are connected by a 24-inch diameter pipe. The connector pipe will equalize and act as a composite basin when the water surface level at DETN rises above the invert of DETS, which is El. 13.7 feet. Runoff from the open space southern boundary between the project boundary and the railroad will discharge into detention basin DETS. DETN will receive flows from four separate conduits, with P1 being the 36-inch diameter main trunk from the proposed on-site drainage network. Furthermore, runoff from portions adjacent to Business 80 and open space at the northwest project boundary will discharge directly into DETN. The intake of the on-site pump station will be at an elevation of El. 9.5 feet.

The flow into detention basin DETN for the 10/100-year 24-hour storm events is shown in **Figure 7**. The peak flow rates for 100-year 24-hour and 10-year 24-hour storm events are 52.7 and 36.2 cfs respectively. This peak flow timing for both events for proposed conditions is similar (at around 12 hour from the start of rainfall) to that of the peak flows from the off-site drainage into Sump 99. Total volume of flow into this final accumulation point of on-site drainage system is 12.5 acre-feet and 7.7 acre-feet for 100-year 24-hour and 10-year 24-hour storm events. Runoff discharged directly into DETS is only 1.4 cfs and 0.7 cfs in 100-year 24-hour and 10-year 24-hour storm events respectively.

The water surface elevation at basin DETS and DETN at 10-year 24-hour, 100-year 24-hour and 100-year 10-day storm events is shown on **Figure 8A** through **Figure 8D.** The peak stage occurs at nearly 1.8 hours and 5.7 hours later than the peak flow in 10-year 24-hour and 100-year 24-hour storm event respectively, because the on-site pump is turned off during the peak flow period and, thereby, allows storing of water in the detention basins. The 100-year 24-hr rainfall event governs the peak stage at the detention basins. The storage in the south detention basin DETS is negligible during a 10-year storm event; however, this is significant in 100-year storm events.

The peak stage of the detention basin is given in **Table 10**:

Table 10
Proposed Detention Basin Results

Detention Basin	Bottom Elevation (feet)	Top Elevation (feet)	Total Available Volume (acre-feet)	Peak Stage/Volume at 10-year 24-hour Storm (feet)		Peak Stage/Volume at 100-year 24-hour Storm (feet)		Peak Stage/Volume at 100-year 10-day Storm (feet)	
				Stage (feet)	Volume (acre-feet)	Stage (feet)	Volume (acre-feet)	Stage (feet)	Volume (acre-feet)
DETS	13.7	20	1.6	14.0	0.10	16.8	0.6	15.5	0.3
DETN	9.5	17	7.7	13.8	3.7	16.8	7.5	15.5	5.9

Pump and Force Main

Proposed on-site pump station will be used to convey water from the detention basin (DETN) to the existing Sump 99, which is located approximately 4,200 feet from the detention basin. There are three 5-cfs pumps placed in a sump with one pump used as the spare. The type of pump and the pump curve used in this analysis are shown in **Appendix I.** The proposed model of the pump to be used for this study is JCU, Size: 8x8.5-17.25, Group: S, 60 Hz, RPM: 870; however, this may change during the design phase. Two pumps will be running simultaneously to discharge the storm water with a maximum rate of 10 cfs at a DETN stage of El. 17± feet to the top of the sump of elevation of El. 24.5 feet. The reason for connecting the force main at the top of Sump 99 is to avoid any interference with the existing flow. An 18-inch diameter PVC pipe is used as force main, with a total length of 4,200± feet. This pump will start when the water surface elevation in the basin rises above El. 11.5 feet, and the pump will stop when the level drops below El. 10.0 feet. In addition, the pumps will also be turned off when the water surface elevation in Sump 99 is greater than El. 13.0 feet so that the flow condition in the existing drainage system is not overburdened by the additional flow from the McKinley Village on-site.

Conditions at Sump 99

Based on the operating criteria of the on-site pumps, as the water level in the sump rises above El. 13.0 feet, the McKinley pump station will remain off for approximately 1.6 hours, 5.3 hours and 4.0 hours during the 10-year 24-hour, 100-year 24-hour and 100-year 10-day storm events, respectively. The flow hydrographs through the force main and the stage at the Sump 99 at different storm events are shown in **Figure 9A** through **Figure 9C** and **Table 11**, and show a comparison of the peak stage at Sump 99 at different storm events. Furthermore, the fluctuation

in the flow through the force main, before and after the peak stage period, may also be dictated by the water surface elevation in the north detention basin DETN as mentioned above.

Table 11
Stage at Sump 99 at Different Scenarios

Scenario	Peak Stage at 10-year 24-hour Storm (feet)	Peak Stage at 100-year 24-hour Storm (feet)	Peak Stage at 100-year 10-day Storm (feet)
Pre-Project	22.7	24.2	22.2
Post-Project	22.4	23.7	22.2

A comparison of existing condition and proposed condition stage in the Sump 99 is shown in Figure 9D through Figure 9F. In general, the stage hydrographs have been divided into three time zones. Zone A represents the period when the stage is generally below El. 13.0 feet. The fluctuation in the low flow and stage in the Sump 99 is generally due to the set pumping parameter for bottom 48.5 cfs pump as described earlier. Zone B is the period during which the stage is higher than El. 13.0 feet. As the stage in the Sump 99 rises above El. 13.0 feet, on-site pumps will remain off for approximately 5.3 hours, 1.6 hours and 4 hours for the 100-year 24-hour, 10-year 24-hour, and 100-year 10-day storm events, respectively. Because the on-site pumps are turned off during this period, the stage at the Sump 99 almost coincides in both existing and proposed conditions. A 100-year 10-day storm has a predominate zone B in the fourth peak and a very short period (nearly an hours) of Zone B in the third peak. Zone C is the period when peak flow recedes and stage come down below El. 13.0 feet. During this period, Sump 99 gets additional volume from the proposed development through the force main for which those pumps must run for a longer period to have the same stage as in the existing condition. At Zone C, the bottom 48.5 cfs pumps in the Sump 99 will have to run approximately 10 hours, 6 hours, and 8 hours longer for the 100-year 24-hour, 10-year 24-hour, and 100-year 10-day storm events, respectively. Since, there is an un-interrupted inflows from the proposed development during the first, the second and the fifth peaks in 100-year 10-day storm event (as shown in Figure 9F) the stages in the reaches at El. 11.22 feet sooner ,the bottom two pumps in the Sump 99 run earlier, and net outflow from the Sump 99 is higher at post-development condition than in the existing conditions (See Table 1 for the operating stage for the bottom two pumps.). For the same reason, stage in the Sump 99 lowers down sooner in the proposed conditions of these peaks.

Off-Site Drainage Contribution (XPSWMM)

The off-site/existing drainage system stage hydrograph at pre- and post-project condition is compared at three nodes near Sump 99: Node 399, Node 301 and Node 300. These are shown in **Figure 10A** through **Figure 10C.** It has been found that these stage hydrographs coincide at the peak regime. Since, difference between the pre- and the post-project condition is negligible in these three nodes; this difference in the networks upstream of these three nodes also should be negligible. **Appendix J1** shows the flow and HGL at different nodes in the off-site drainage network at 100-year 24-hr storm event. The difference in the maximum HGL at pre- and post-project conditions is shown in table format in **Appendix J2**. The model results show the peak flow and HGL are almost the same in the existing and the proposed conditions.

LID/H-M Facilities

The drainage system incorporates LID/H-M principles to reduce urban stormwater runoff and meet the water quality requirements. LID/H-M principles include increasing pervious surfaces; disconnecting impervious cover; increasing use of amended soils to increase storage, infiltration and evapo-transpiration; encouraging infiltration; and providing detention, extended detention, and retention storage. Stormwater from buildings and streets is directed into vegetated areas instead of curbs and drainage inlets. The project will incorporate LID/H-M facilities to implement these principles. Streets will utilize cross-gutters to keep stormwater at the street grade, so that it can be directed to medians and planter areas instead of immediately entering drainage inlets into the storm drain conveyance system. LID/H-M facilities used in the project include the following:

- Interceptor Trees
- Native/Adapted Vegetation
- Disconnected Roof Drains
- Open Space Stormwater Planters
- Infiltration Planters (Separated Sidewalk Planters)
- Hydro Modification Facilities (Detention/Percolation Basins in Open Space)
- Bioretention Facilities (Detention/Percolation Basins in Parks)

These facilities are all similar to bioretention and the Stormwater Planter Treatment Control Measure identified in the Stormwater Quality Design Manual for the Sacramento and South Placer Regions. Seven locations of planters are proposed with a total area of one acre. These proposed LID/H-M facilities (shown on **Appendix K1** through **K3**) illustrate the components of each LID/H-M facility in profile view.

Stormwater Quality

The McKinley Village project will be designed to adhere to the minimum water quality standards as defined by the Stormwater Quality Design Manual for Sacramento and South Placer Regions, dated May 2007. Appendix D of the manual has been followed to produce the calculations necessary to identify both the stormwater quality necessary for the overall site as well as the Appendix D-1 worksheet to define the run-off reduction credits given using treatment measures such as 100-percent disconnected roof drains, interceptor trees and the use of separated sidewalks that will accept the flows of all individual house driveways, T-court driveways and alley driveways. Disconnected front yard planters as well as side and planters and remnant landscape areas will be designed to allow the driveway flows to be diverted into these areas (see **Appendices K-1** and **K-2** in this report) and treated by using the volume-based design stated in Form D-1g of the Stormwater Quality Manual. Per the geotechnical report, the existing soils within the site are primarily loose silty-fine sands and silty clays which allow for a moderate hydraulic conductivity (or percolation rate), especially after the site is graded. Given this percolation rate, the 24-hour drawdown time (P_o) was used in calculating the runoff reduction.

Appendix E of the Stormwater Quality Manual was then used to calculate the "Maximized Detention Volume" per the formula WQV (ac-ft) = P_o x A/12. According to Appendix E, P_o yields a constant of 0.30 inches based on a 50-percent impervious factor for single-family detached units. The total site area is 48.8 acres, but we have netted out the parks (7 acres) which leaves 41.8 acres remaining to be treated, including the alleys and T-courts. Please note that each of the parks will provide their own treatment with on-site bioretention basins. We then separated the street areas which were based on a total street length of 10,750 feet and a curb-to-curb width of 25 feet. The area is 322,500 square feet or 7.4 acres. The untreated volume based on the area and drawdown time for the remaining lots (41.8- 7.4 = 34.4 acres) is thus a WQV of 0.86 acre-feet. The 5-foot 10-inch-wide front yard planters are able to hold approximately 3.5 square feet per linear foot of planter. With an average planter strip length of 35 feet (excluding driveways), the volume per lot is about 122.5 cubic feet or 0.92 acre-feet for the 328 planned homes. Each individual unit as well as the T-court product were also checked, and it was verified that the planters have sufficient capacity to store all of the required volume-based detention.

With the lots and parks now meeting the water quality requirements, the remaining public streets were examined. The area of the streets (curb to curb) is approximately 322,500 square feet or 7.4 acres. Although we are able to capture about 10 percent of the volume from the street into the "remainder parcels", we have assumed a worst case of the entire 7.4 acres out-falling into a water quality/ detention basin at the west end of the site. Assuming an impervious constant of

100 percent for pavement and a 24-hour drawdown time, the P_o for the streets is 0.80 inches. Now using the WQV formula once again, we find that a Water Quality Basin holding 0.49 acre-feet of volume is required. The water quality basin at the west end of the site has been separated into three different tiered sections with different elevations. The lowest portion of the basin (just north of A Street entering the site from the west), is approximately 0.5 acres in size. This lower basin will be used to capture the "first flush" of rainfall at a depth of one foot and used for volume based treatment assuming the 24-hour drawdown time. The intake pipe at the pump station will be situated to allow this volume to be treated prior to turning on.

Appendix L identifies the water quality runoff reduction calculations.

XI. MODEL FINDINGS

The following bullet points are existing and future condition results that are significant to the project:

- The existing condition drainage evaluation network for Sump 99 was compared using SSWMM96 and XPSWMM. The volume and the flow comparisons at the Sump 99 are very similar between the two model formats. XPSWMM produced slightly higher flow at the beginning of the storm event. The stage hydrograph at the peak is relatively flatter in XPSWMM results. Our professional opinion is that the existing condition XPSWMM results compare well with the SSWMM96 program; therefore, XPSWMM will be adequate to evaluate proposed conditions. Based on the criteria set up for the operation of the on-site pump station, as the water level in Sump 99 rises above El. 13 feet, the pumps will remain off for approximately 5.3 hours, 1.6 hours, and 4 hours for the 100-year 24-hour, 10-year 24-hour, and 100-year 10-day storm events, respectively.

- The peak stage at both on-site detention basins and at Sump 99 is governed by the 100-year 24-hour storm event.

- The rise in water level at the north detention basin (DETN) and the south detention basin (DETS) will satisfy the city criteria for the 10-year 24-hour storm. The proposed basins will act as one composite detention basin to accommodate additional storage volume of water from DETN during the higher flows.

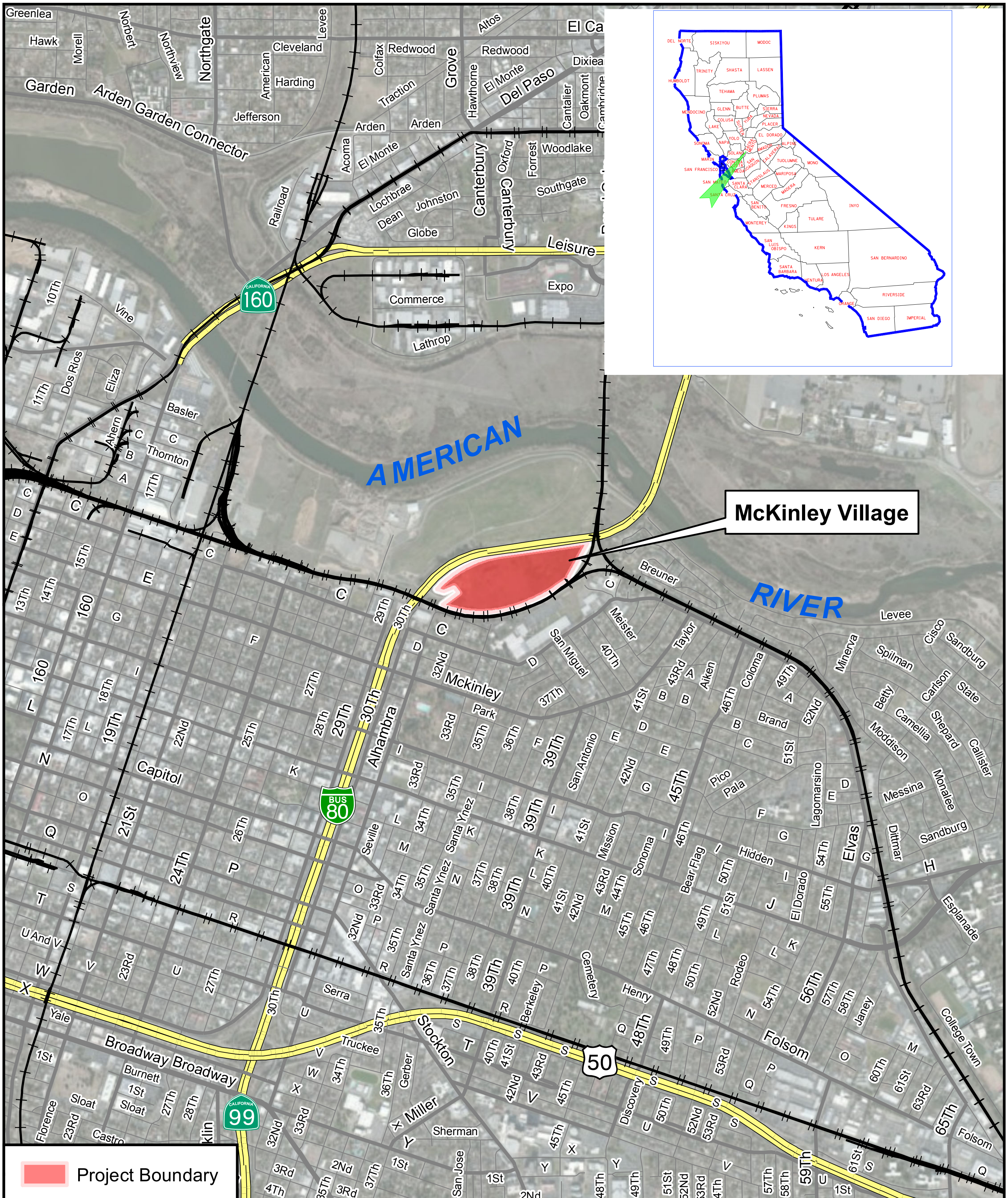
- The on-site detention basins and the operating schedule of the on-site pump station have been sized to meet detention volume requirements per the City design requirements for 10-year and 100-year events and will not impact the existing off-site

drainage Basins 10 and 99 and will not impact the operating parameters of Sump 99. However, the bottom 48.5 cfs pumps in the Sump 99 will have to run approximately 10 hours, 6 hours, and 8 hours longer for the 100-year 24-hour, 10-year 24-hour, and 100-year 10-day storm events, respectively.

XII. CONCLUSIONS

The McKinley Village project will discharge to Sump 99 which in turn discharges to the American River. Since there is no overland release off-site from the project, the storm water runoff is controlled by two 5-cfs pumps. To mitigate the post-project runoff volume, an on-site detention basin will store the excess runoff volume when the proposed on-site drainage pump system shuts off due to the Sump 99 stage reaching the existing project elevation. The pre- and post-development model evaluation results satisfy the City's design requirements while having no impact on the existing off-site drainage system.

FIGURES



ENCORE MCKINLEY VILLAGE, LLC
VICINITY MAP
CITY OF SACRAMENTO, CA
SEPTEMBER, 2013

NORTH

0 1,250 2,500
FEET

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_1_VicinityMap_20130905_V1.mxd 9/4/2013 2:07:17 PM jbuchanan

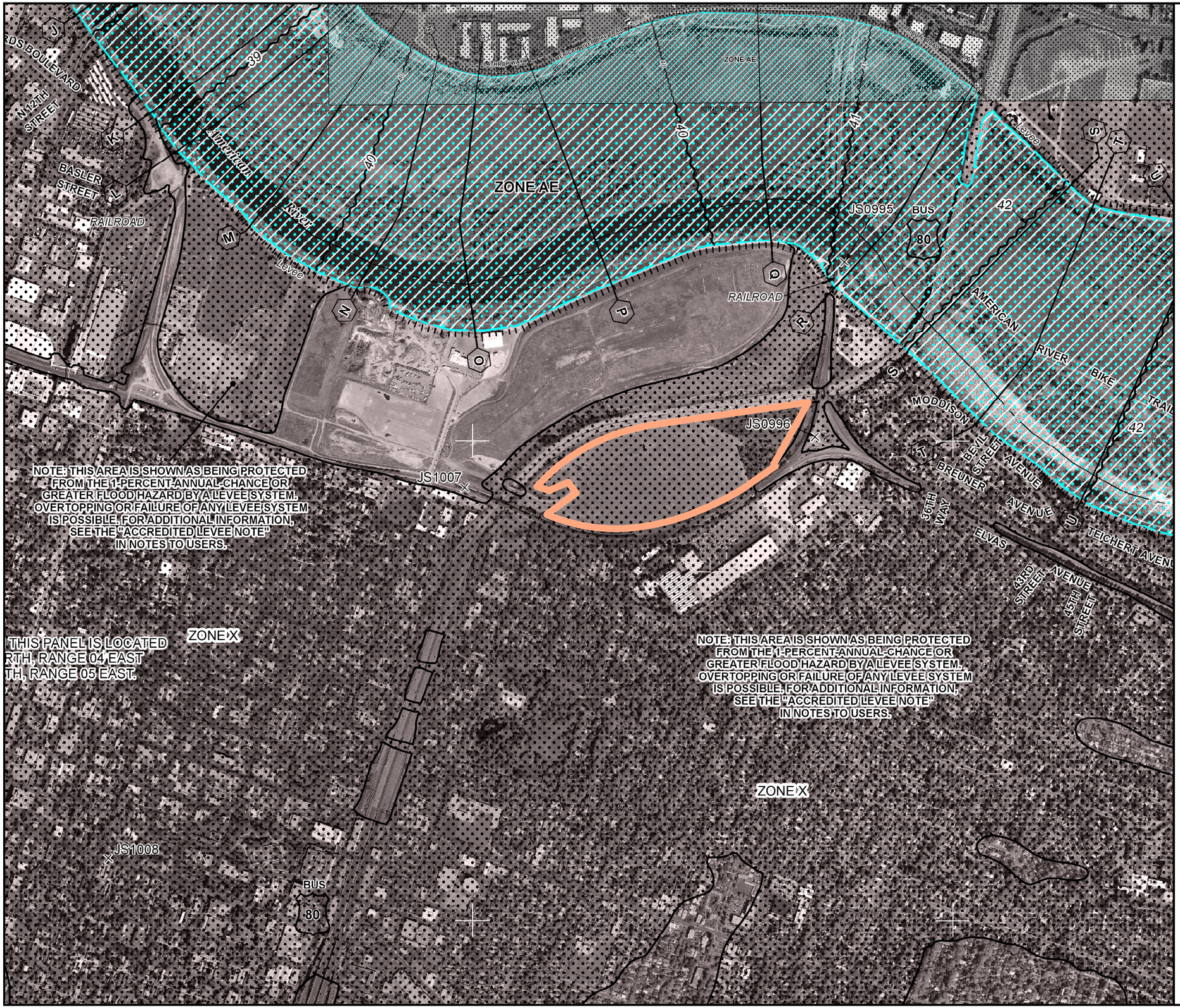
FIGURE 1

ENCORE MCKINLEY VILLAGE, LLC

EFFECTIVE FEMA FIRM (2012)

CITY OF SACRAMENTO, CA

SEPTEMBER, 2013



0 500 1,000

FEET

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
	Limit of Moderate Wave Action
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

	Cross section line
	Transect line
	Culvert, Flume, Penstock or Aqueduct
	Road or Railroad Bridge
	Footbridge
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276000 N	1000-meter Universal Transverse Mercator grid values, zone 10
600000 FT	5000-foot grid values: California State Plane coordinate system, zone II (FIPSZONE 0402), Lambert Conformal Conic projection
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile
	Project Boundary

NOTES:
FEMA Paper FIRM Effective August 16, 2012.
Elevations shown are vertical datum NAVD 88.
Conversion to City Datum -2.167 feet.

PRELIMINARY

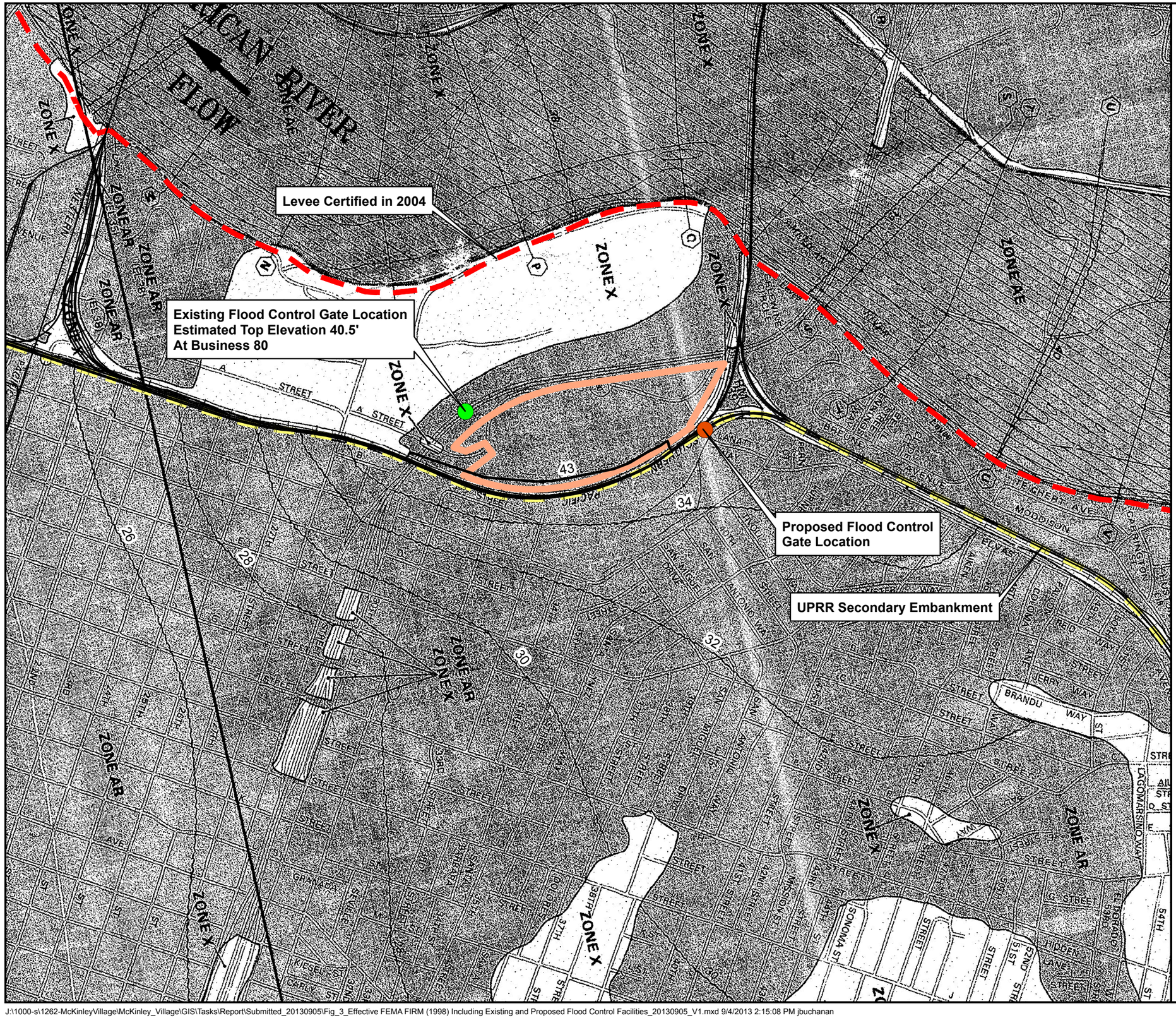
WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_2_FEMA_FIRM_2012_20130905_V1.mxd 9/4/2013 2:08:08 PM jbuchanan

FIGURE 2

ENCORE MCKINLEY VILLAGE, LLC

EFFECTIVE FEMA FIRM (1998)
INCLUDING EXISTING AND PROPOSED
FLOOD CONTROL FACILITIES
CITY OF SACRAMENTO, CA
SEPTEMBER, 2013



NORTH

0 500 1,000
FEET

- Railroad
- UPRR Secondary Embankment
- Certified Levee in 2004
- Project Boundary

Flood Control Gate Location:

- Existing
- Proposed

NOTES:
FEMA Paper FIRM Effective July 6, 1998.
Elevations shown are vertical datum NGVD 29.
Conversion to City Datum +0.4 feet.

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_3_Effective FEMA FIRM (1998) Including Existing and Proposed Flood Control Facilities_20130905_V1.mxd 9/4/2013 2:15:08 PM jbuchanan

FIGURE 3

ENCORE MCKINLEY VILLAGE, LLC

OFFSITE DRAINAGE SHED MAP

CITY OF SACRAMENTO, CA

SEPTEMBER, 2013

NORTH

0 500 1,000

FEET

99 Pump Station

Streets

Feature Class Type

- Interstate
- Highways
- Major Roads
- Minor Roads
- Overland Flow From Shed 10
- Railroad
- Project Boundary

Shed Name:

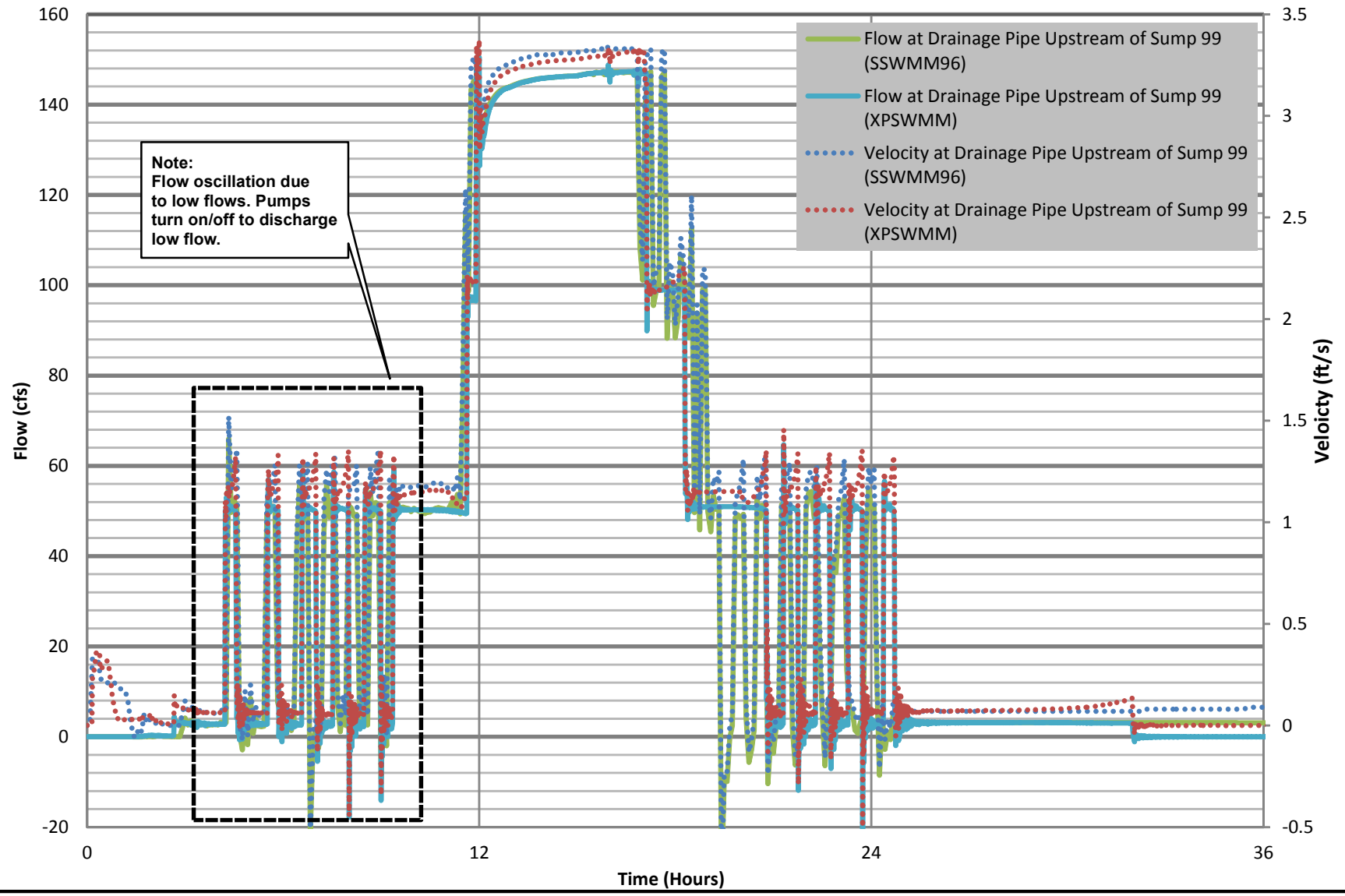
- Basin 10
- Basin 101
- Basin 155
- Basin 38
- Basin 99
- Combined
- Combined Landfill
- State

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_4_Offsite Drainage Shed Map_20130905_V1.mxd 9/4/2013 2:16:51 PM jbuchanan

FIGURE 4



ENCORE MCKINLEY VILLAGE, LLC

EXISTING CONDITIONS 100-YR 24-HR STORM FLOW AND VELOCITY THROUGH 90" CONDUIT DISCHARGING INTO SUMP 99

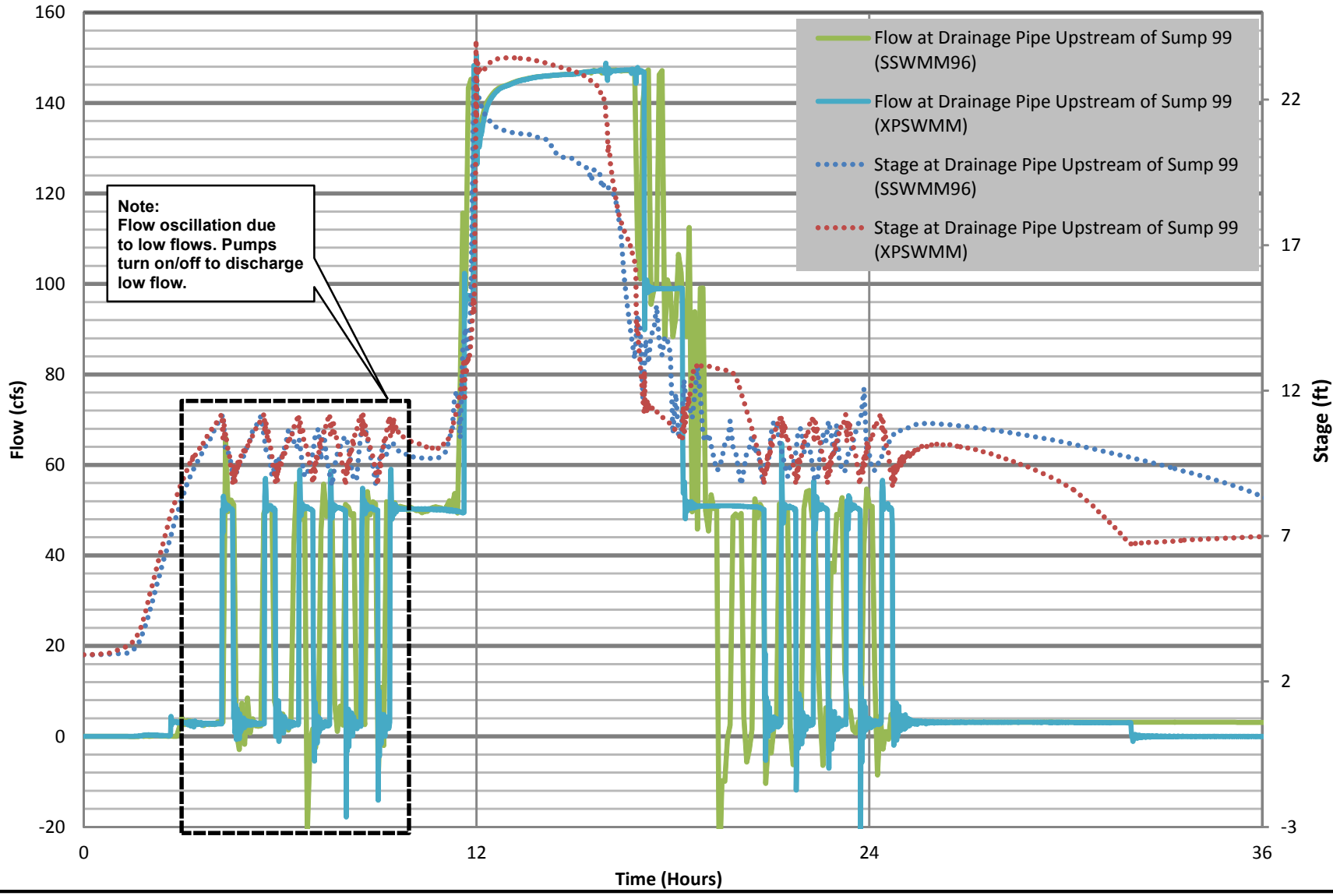
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_5A_Existing Conditions 100-yr 24-hr storm flow and velocity through 90" conduit discharging into Sump 99_20130905_V1.mxd 9/4/2013 3:02:47 PM jbuchanan

FIGURE 5A



ENCORE MCKINLEY VILLAGE, LLC

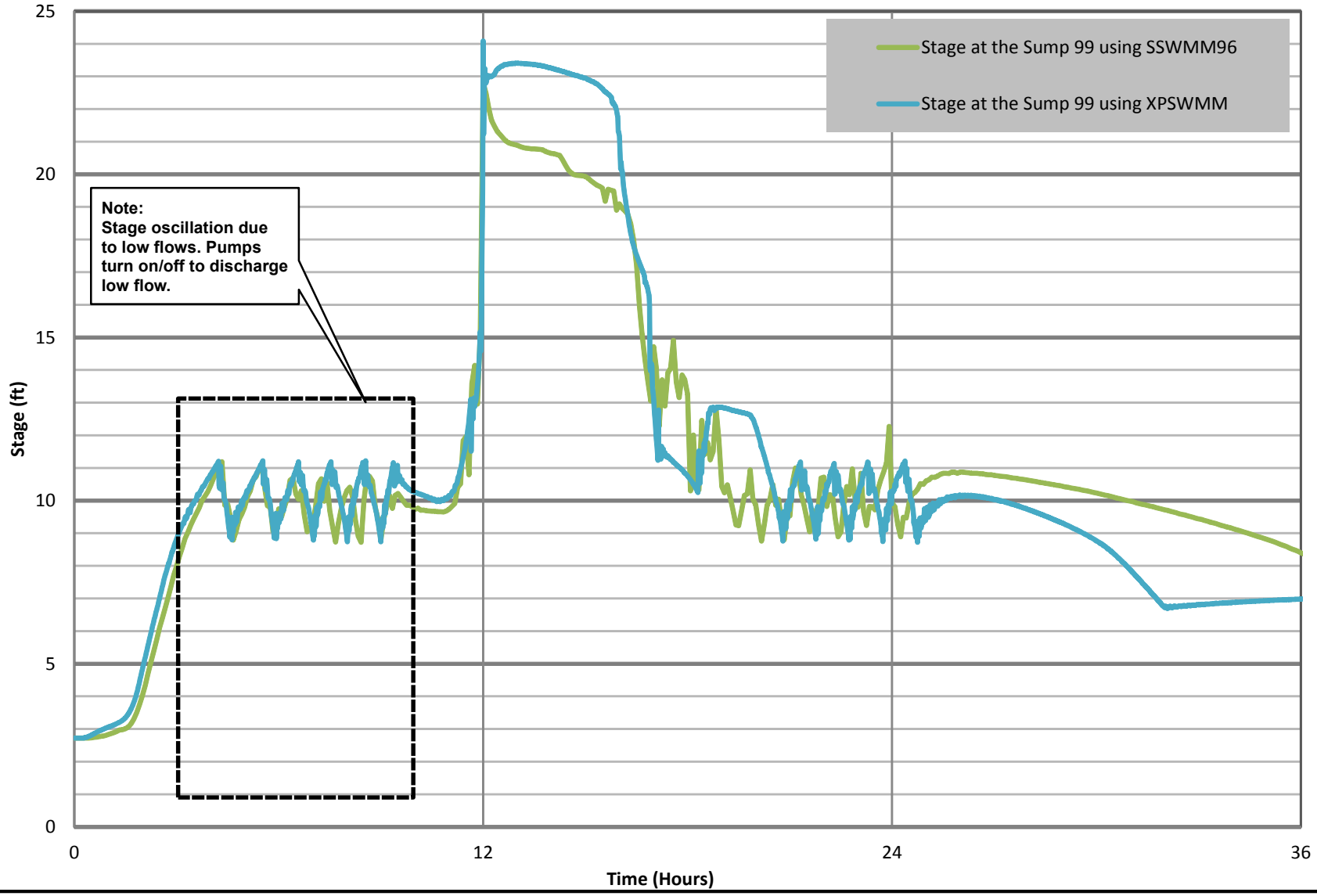
EXISTING CONDITIONS 100-YR 24-HR STORM FLOW AND UPSTREAM STAGE FOR 90" CONDUIT DISCHARGING INTO SUMP 99

SACRAMENTO, CA
SEPTEMBER, 2013

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_5B_Existing Conditions 100-yr 24-hr storm flow and upstream stage for 90" conduit discharging into Sump 99_20130905_V1.mxd 9/4/2013 3:02:59 PM jbuchanan

FIGURE 5B



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF STAGE AT SUMP 99 FOR 100-YR 24-HR STORM EVENT USING SSWMM96 AND XPSWMM

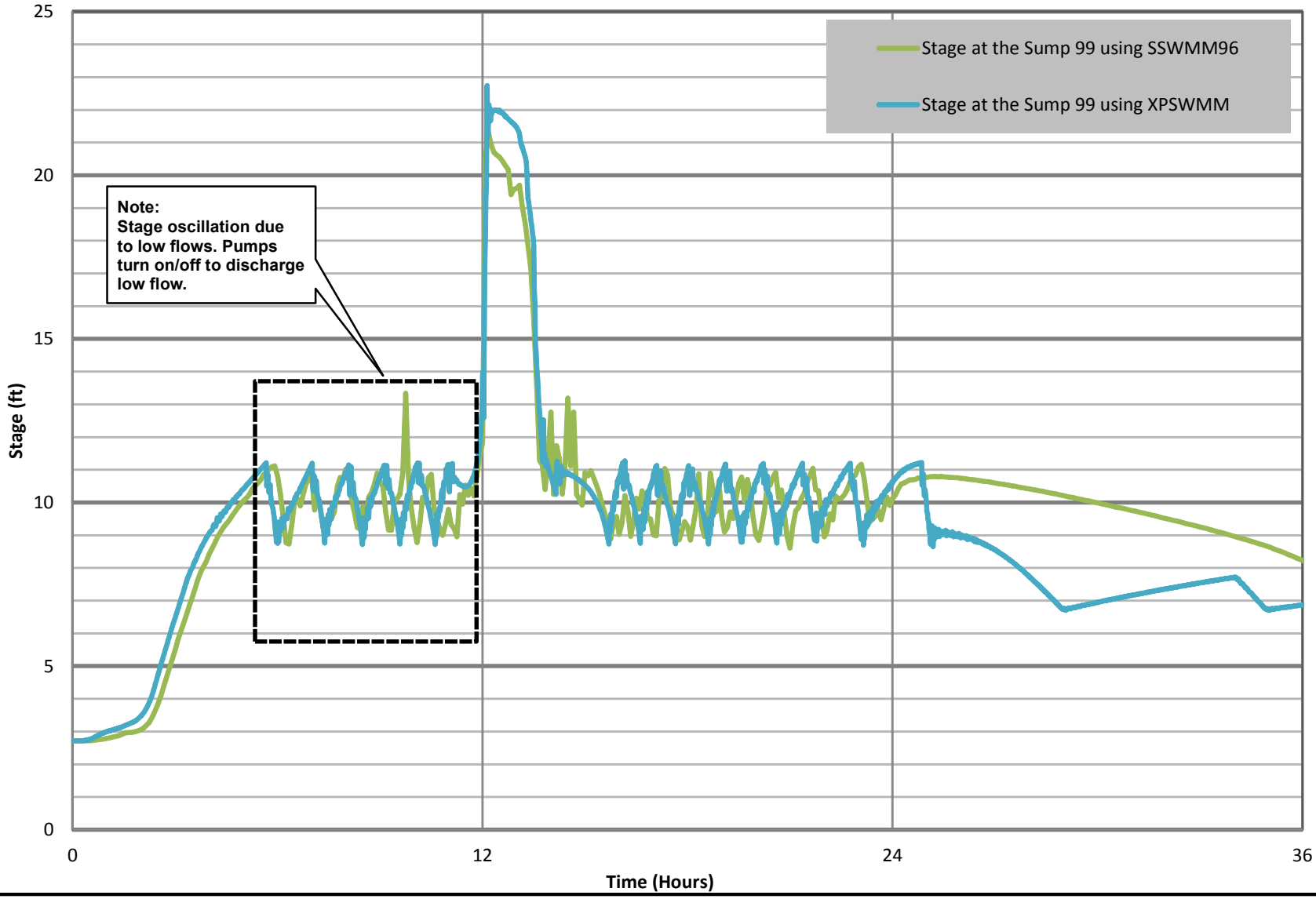
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_6A_Comparison of Stage at Sump 99 for 100-yr 24-hr storm event using SSWMM96 and XPSWMM_20130905_V1.mxd 9/4/2013 3:03:10 PM jbuchanan

FIGURE 6A



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF STAGE AT SUMP 99 FOR 10-YR 24-HR STORM EVENT USING SSWMM96 AND XPSWMM

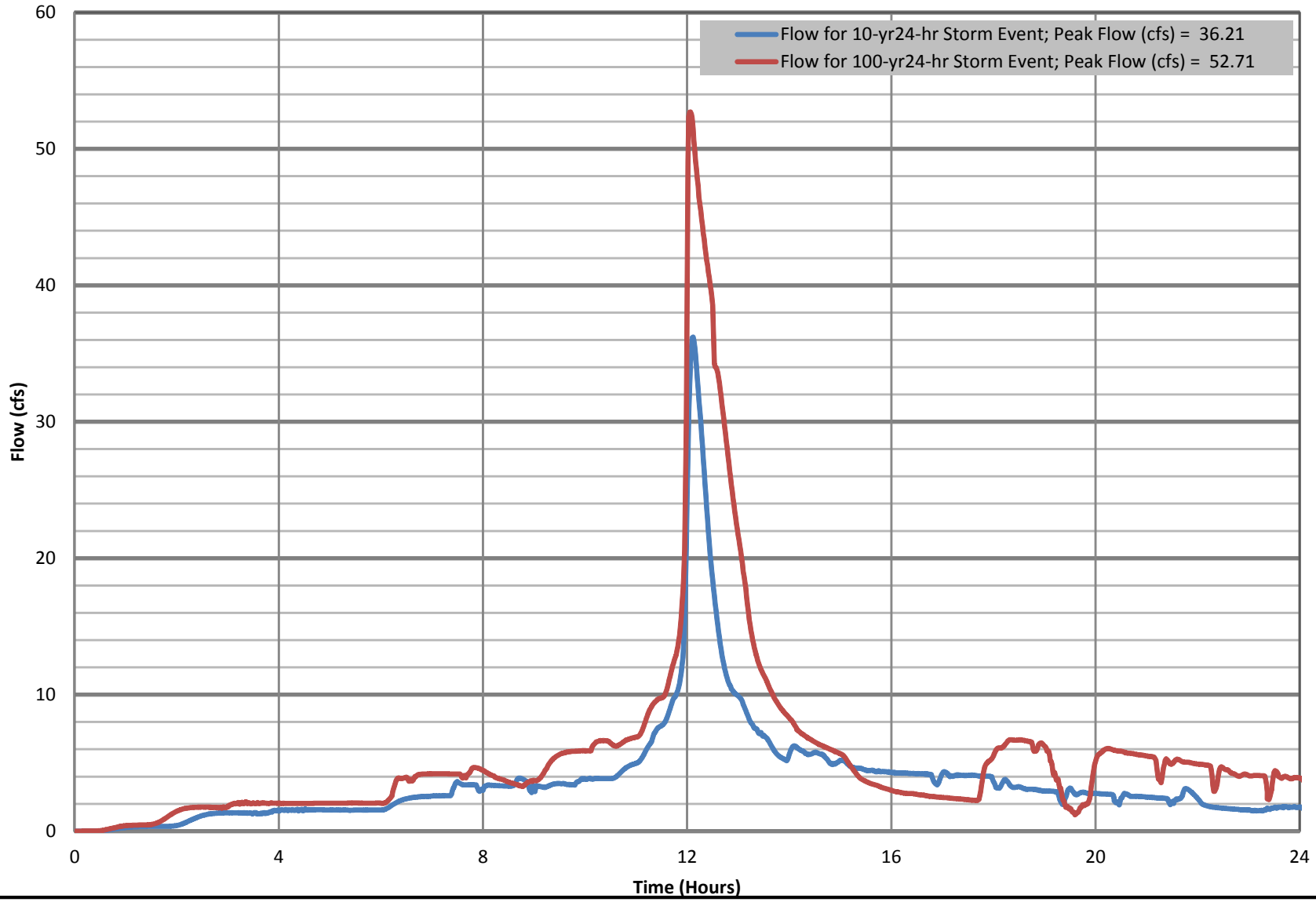
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_6B_Comparison of Stage at Sump 99 for 10-yr 24-hr storm event using SSWMM96 and XPSWMM_20130905_V1.mxd 9/4/2013 3:03:19 PM jbuchanan

FIGURE 6B



ENCORE MCKINLEY VILLAGE, LLC

FLOW HYDROGRAPHS AT PROPOSED ON-SITE NORTH DETENTION BASIN "DETN"

FOR 10010-YR 24-HR STORM EVENT

SACRAMENTO, CA

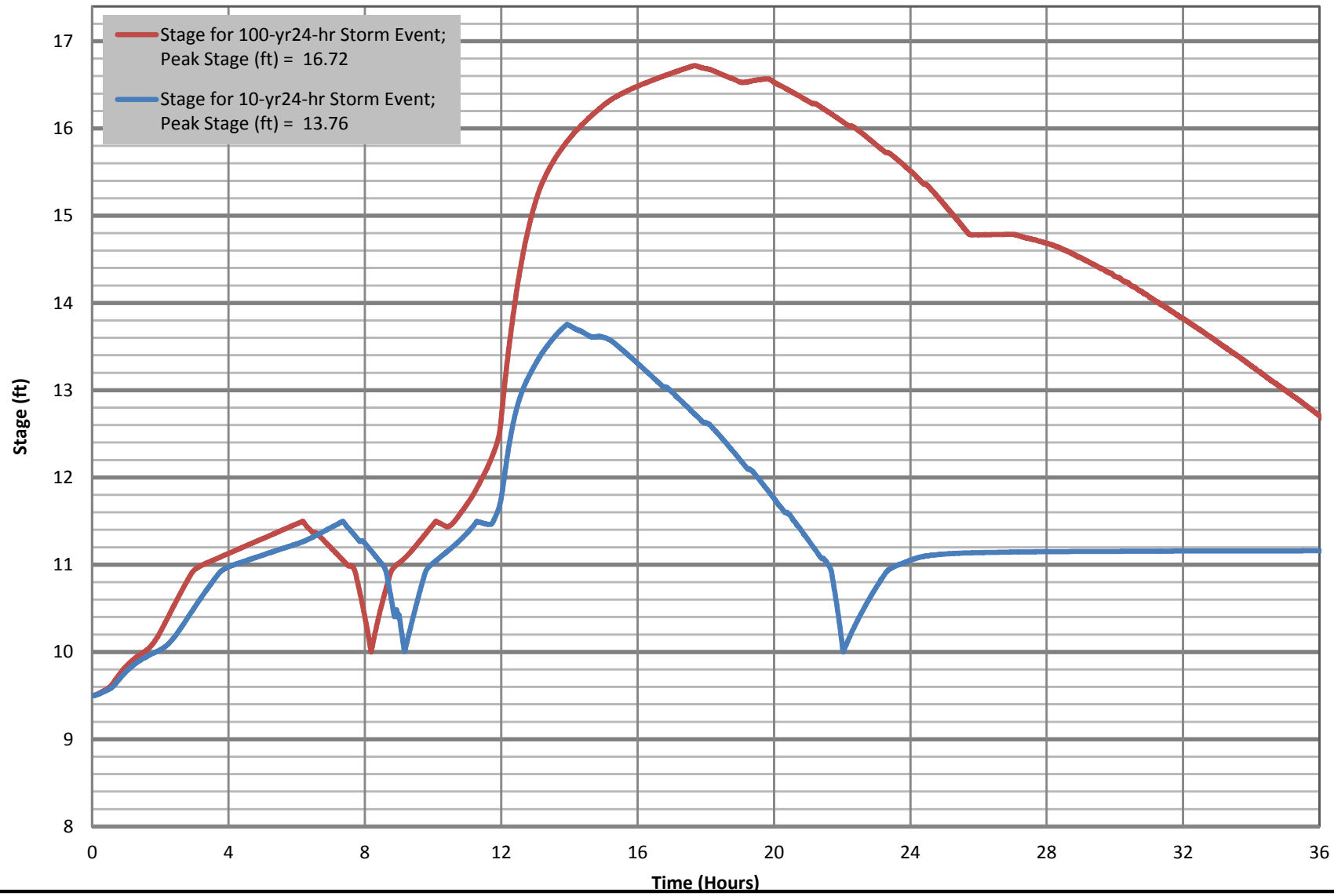
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_7_Flow Hydrographs at proposed on-site North Detention Basin DETN for 10010-yr 24-hr storm event_20130905_V1.mxd 9/4/2013 3:03:30 PM jbuchanan

FIGURE 7



ENCORE MCKINLEY VILLAGE, LLC

STAGE HYDROGRAPHS AT PROPOSED ON-SITE NORTH DETENTION BASIN "DETN"

FOR 100/10-YR 24-HR STORM EVENT

SACRAMENTO, CA

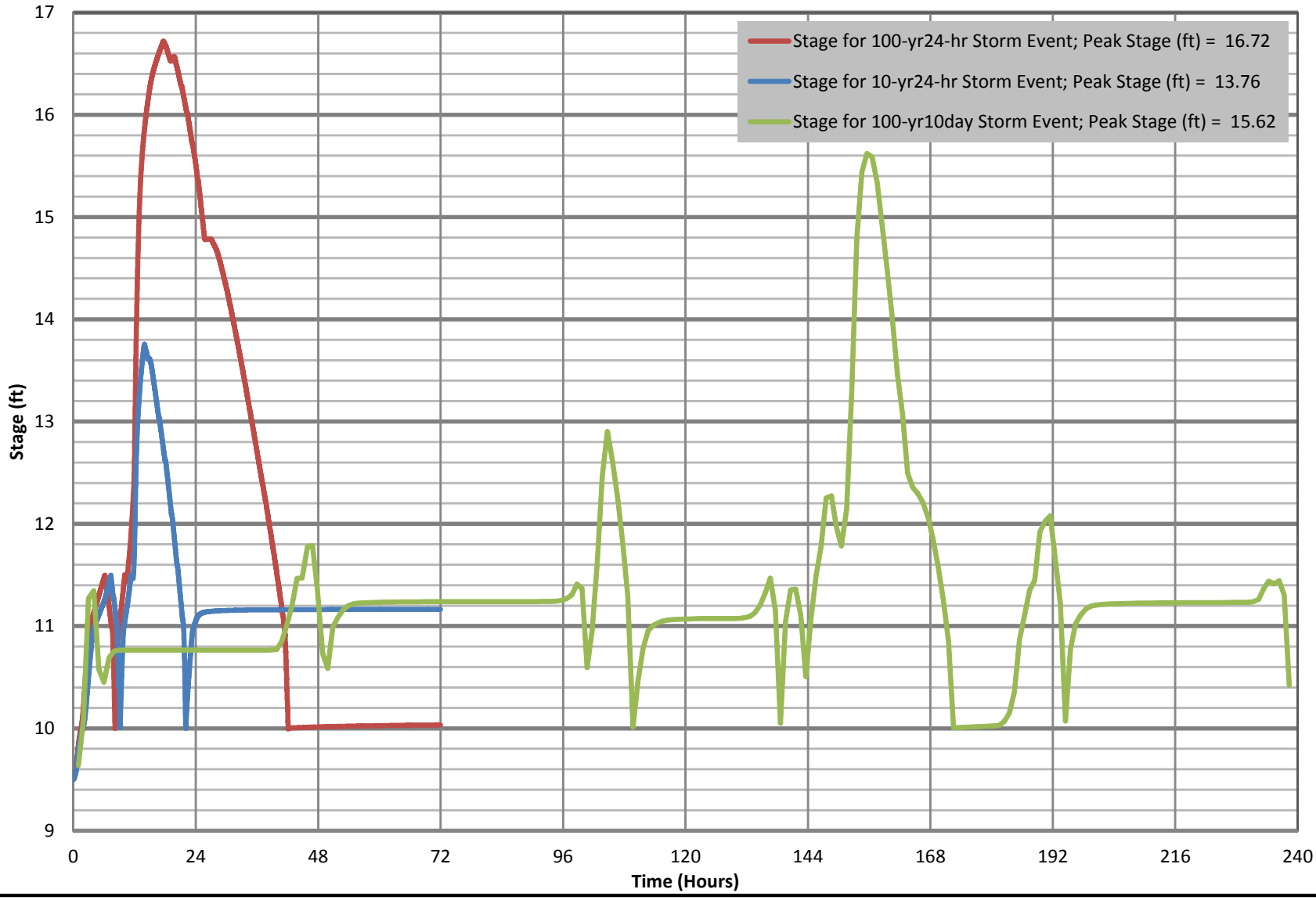
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_8A_Stage Hydrographs at proposed on-site North Detention Basin DETN for 10010-yr 24-hr storm event_20130905_V1.mxd 9/4/2013 3:03:39 PM jbuchanan

FIGURE 8A



ENCORE MCKINLEY VILLAGE, LLC

STAGE HYDROGRAPHS AT PROPOSED ON-SITE NORTH DETENTION BASIN "DETN"

FOR 100/10-YR 24-HR AND 100-YR 10-DAY STORM EVENT

SACRAMENTO, CA

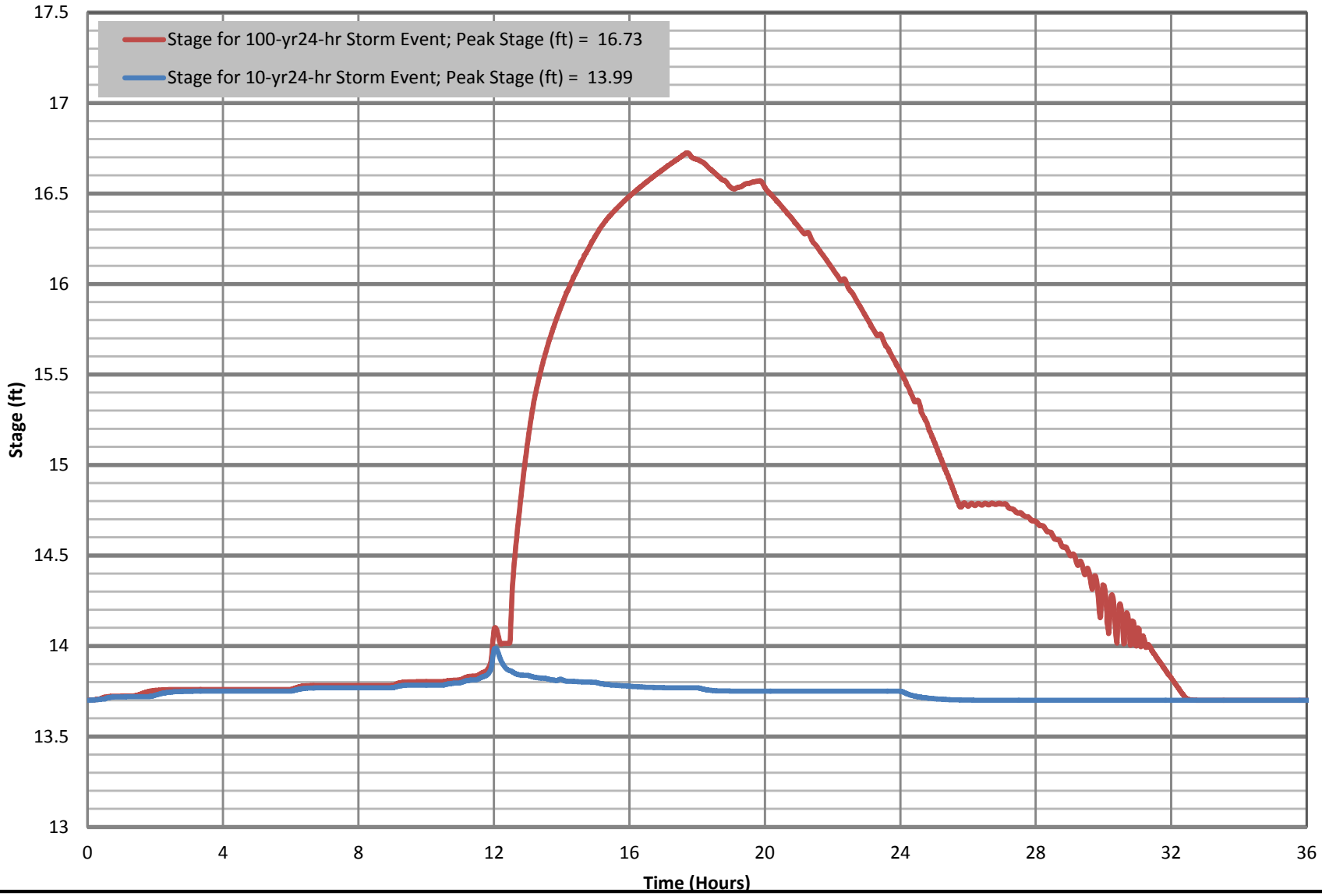
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_8B_Stage Hydrographs at proposed on-site North Detention Basin DETN for 10010-yr 24-hr and 100-yr 10-day storm event_20130905_V1.mxd 9/4/2013 3:03:56 PM jbuchanan

FIGURE 8B



ENCORE MCKINLEY VILLAGE, LLC

STAGE HYDROGRAPHS AT PROPOSED ON-SITE SOUTH DETENTION BASIN "DETS"

FOR 100/10-YR 24-HR STORM EVENT

SACRAMENTO, CA

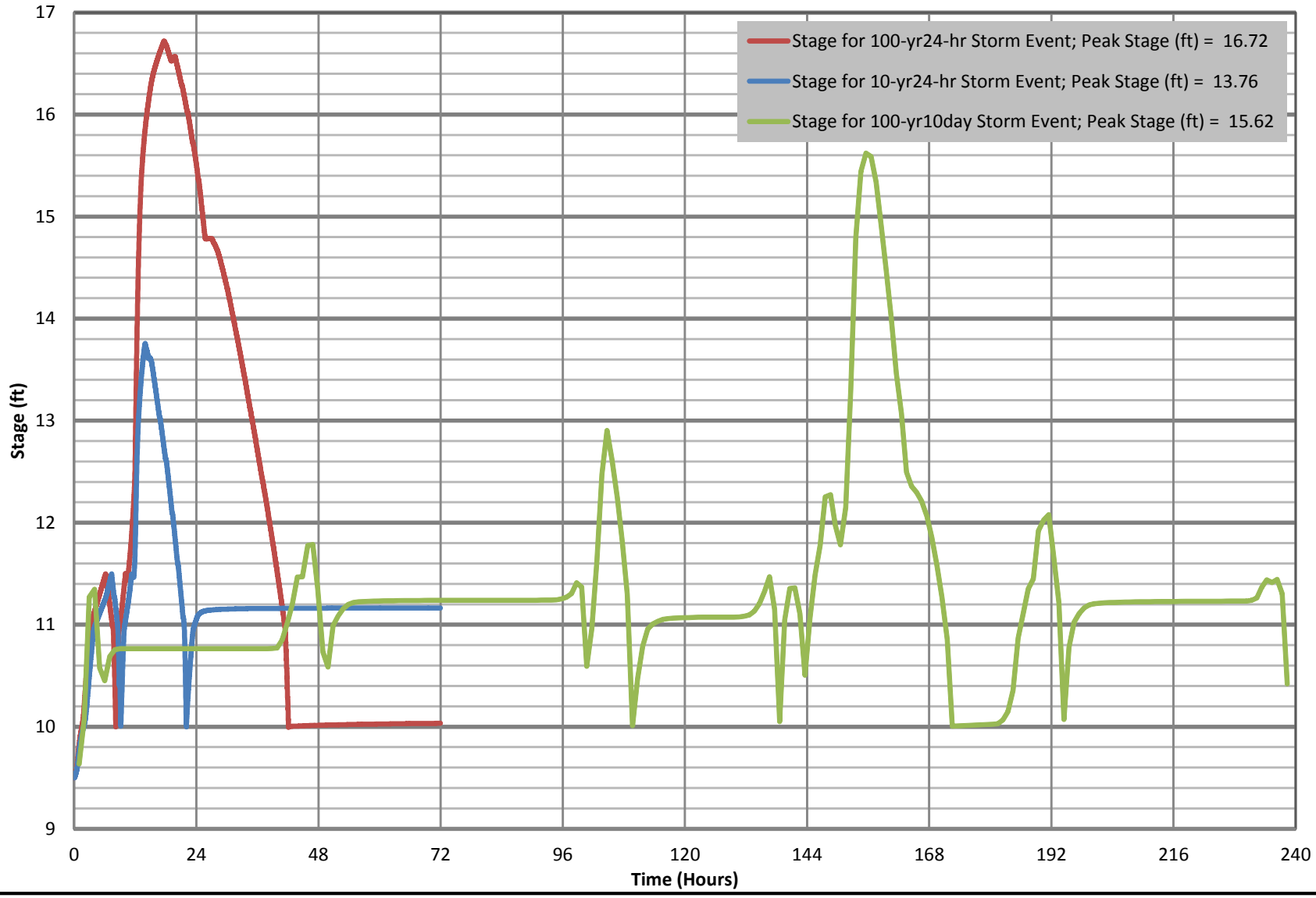
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_8C_Stage Hydrographs at proposed on-site South Detention Basin DETS for 10010-yr 24-hr storm event_20130905_V1.mxd 9/4/2013 3:04:24 PM jbuchanan

FIGURE 8C



ENCORE MCKINLEY VILLAGE, LLC

STAGE HYDROGRAPHS AT PROPOSED ON-SITE SOUTH DETENTION BASIN "DETS"

FOR 100/10-YR 24-HR AND 100-YR 10-DAY STORM EVENT

SACRAMENTO, CA

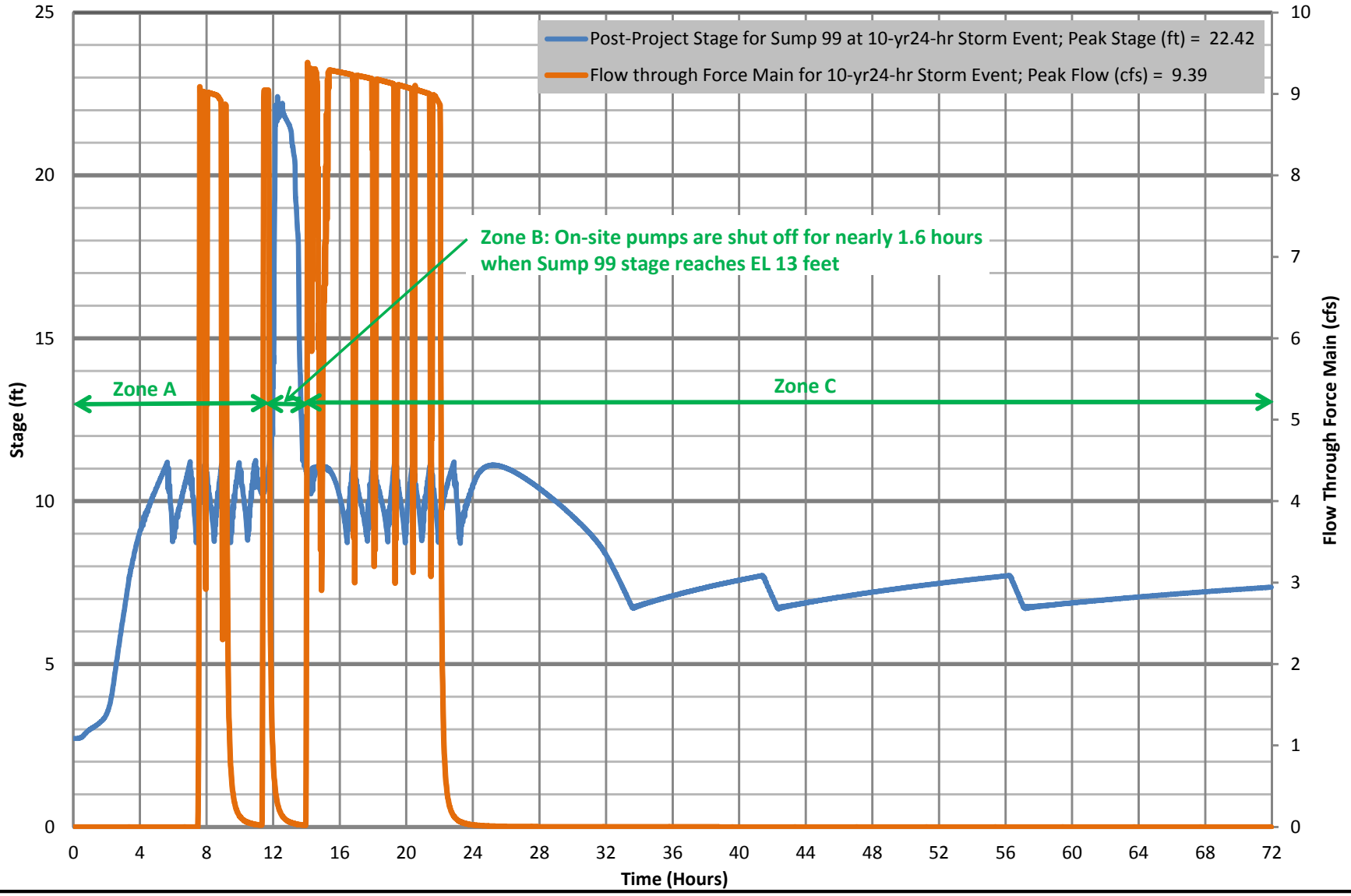
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_8D_Stage Hydrographs at proposed on-site South Detention Basin DETS for 10010-yr 24-hr and 100-yr 10-day storm event_20130905_V1.mxd 9/4/2013 3:04:39 PM jbuchanan

FIGURE 8D



ENCORE MCKINLEY VILLAGE, LLC

PROPOSED STAGE AT SUMP 99 INCLUDING FLOW THROUGH PROPOSED FORCE MAIN FOR 10-YR 24-HR STORM EVENT

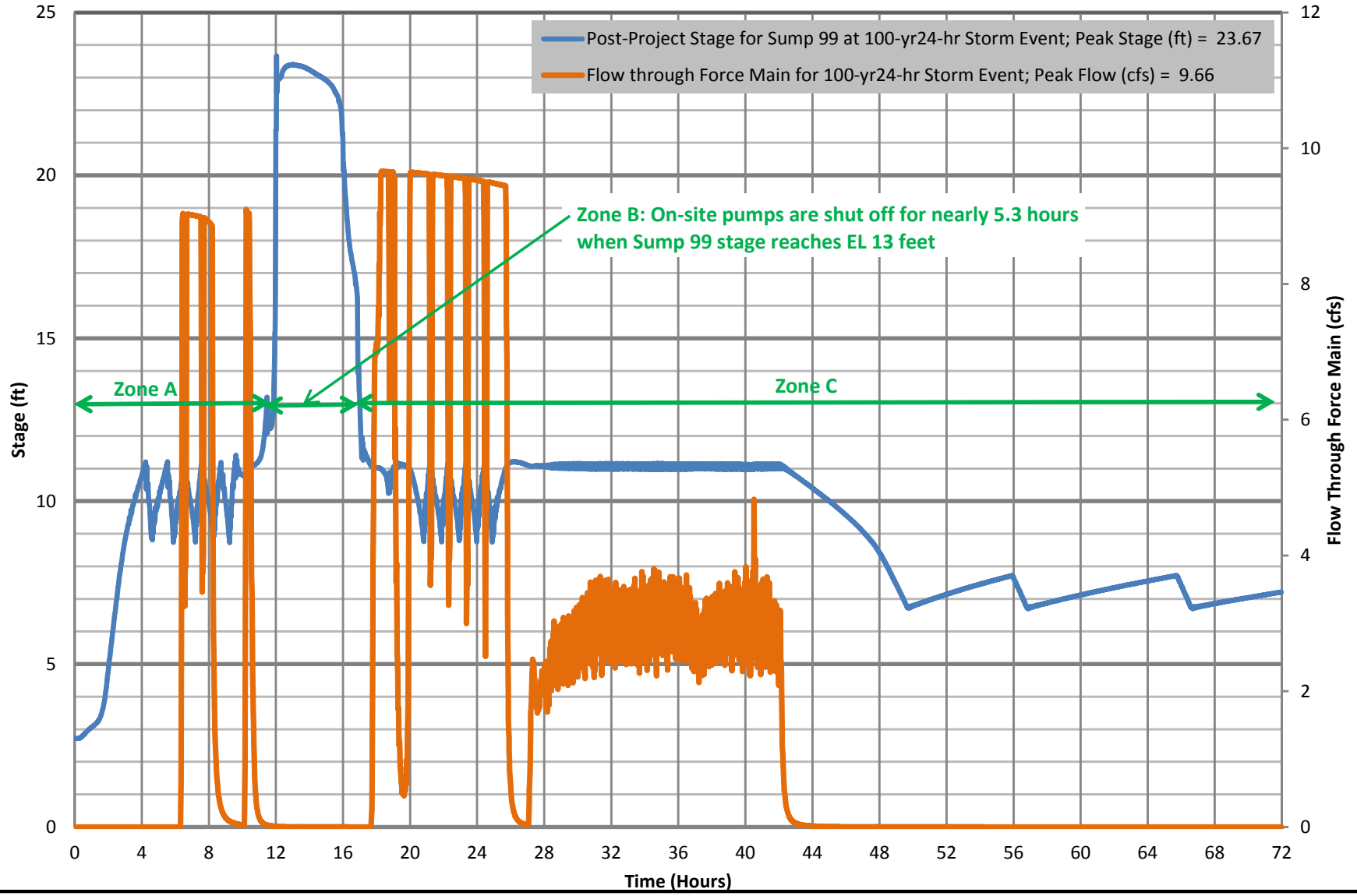
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9A_Proposed Stage at Sump 99 including flow through proposed Force Main for 10-yr 24-hr storm event _20130905_V1.mxd 9/4/2013 3:04:58 PM jbuchanan

FIGURE 9A



ENCORE MCKINLEY VILLAGE, LLC

PROPOSED STAGE AT SUMP 99 INCLUDING FLOW THROUGH PROPOSED FORCE MAIN FOR 100-YR 24-HR STORM EVENT

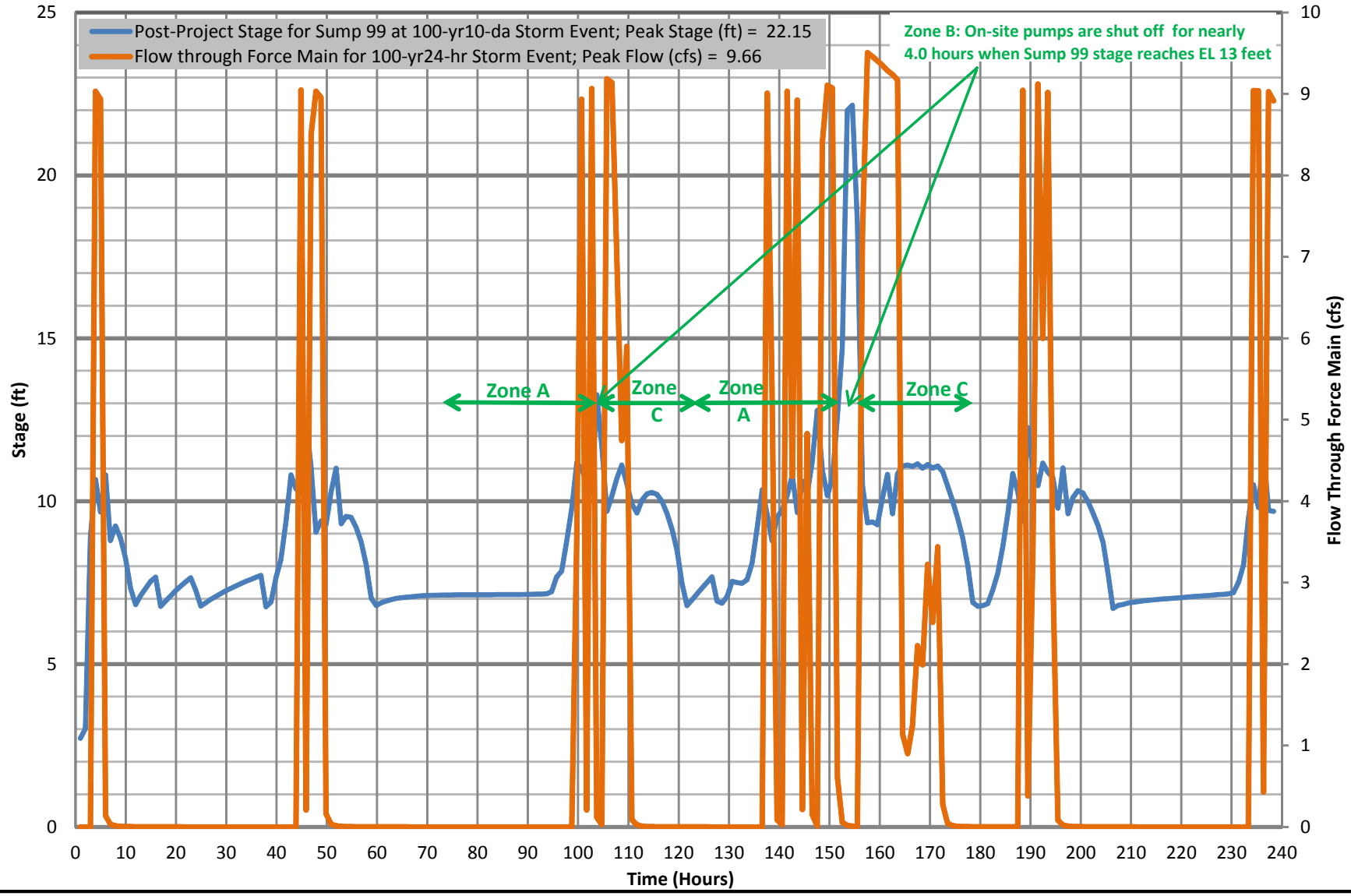
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9B_Proposed Stage at Sump 99 including flow through proposed Force Main for 100-yr 24-hr storm event_20130905_V1.mxd 9/4/2013 3:05:14 PM jbuchanan

FIGURE 9B



ENCORE MCKINLEY VILLAGE, LLC

PROPOSED STAGE AT SUMP 99 INCLUDING FLOW THROUGH PROPOSED FORCE MAIN FOR 100-YR 10-DAY STORM EVENT

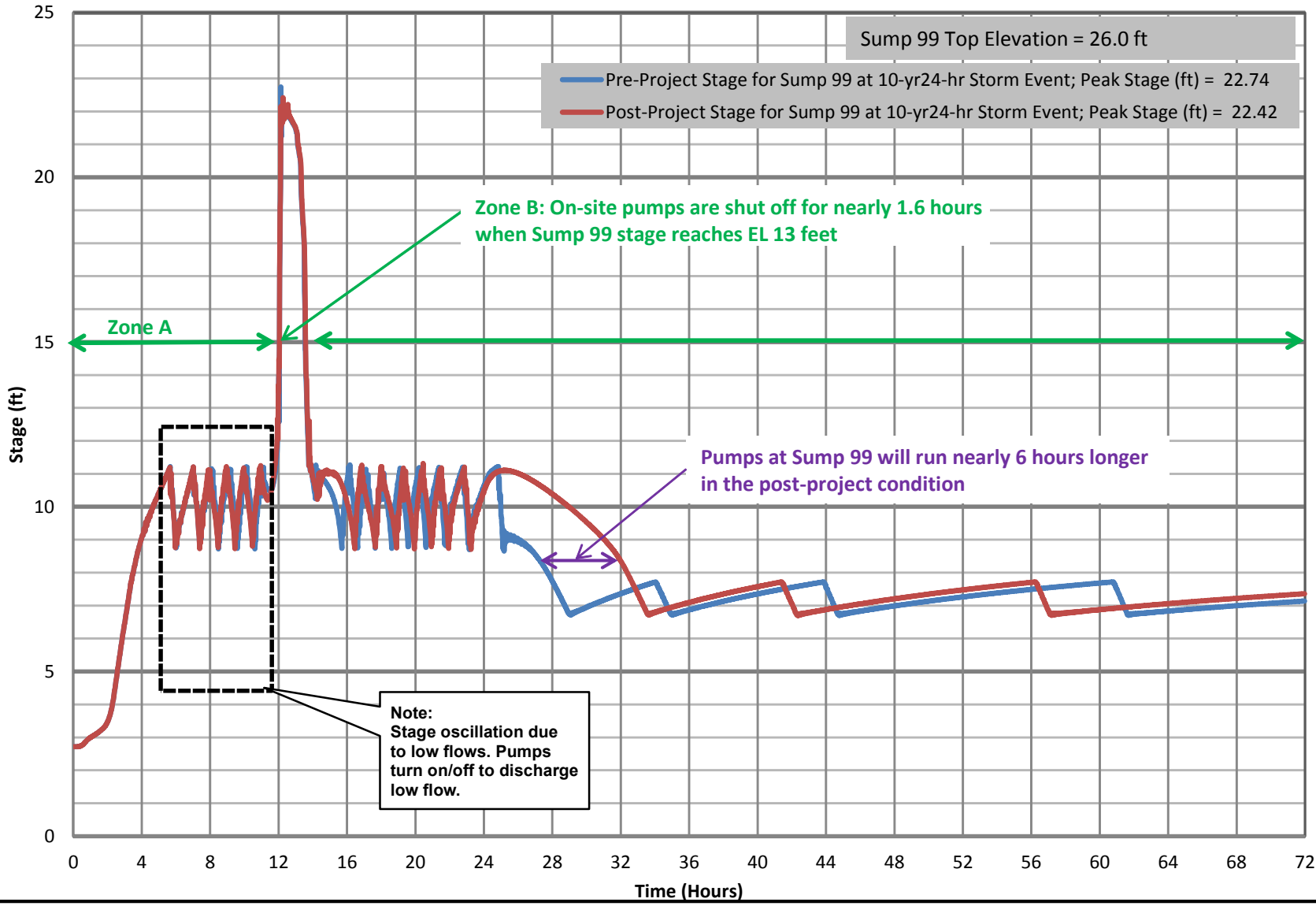
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9C_Proposed Stage at Sump 99 including flow through proposed Force Main at 100-yr 10-day storm event _20130905_V1.mxd 9/4/2013 3:05:27 PM jbuchanan

FIGURE 9C



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT SUMP 99 FOR 10-YR 24-HR STORM EVENT

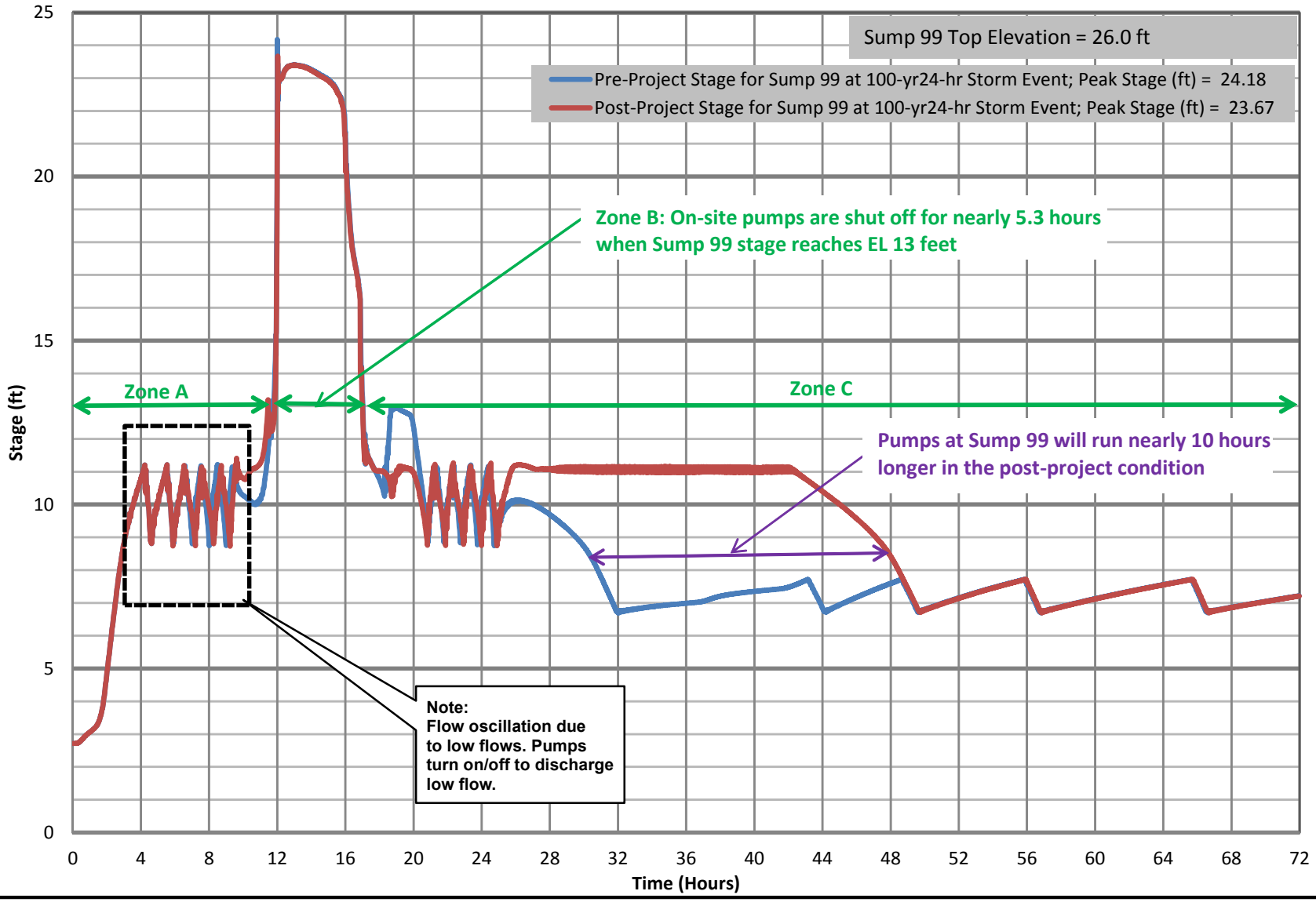
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9D_Comparison of Pre and Post-Project Stage at Sump 99 for 10-yr 24-hr storm event_20130905_V1.mxd 9/4/2013 3:05:40 PM jbuchanan

FIGURE 9D



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT SUMP 99 FOR 100-YR 24-HR STORM EVENT

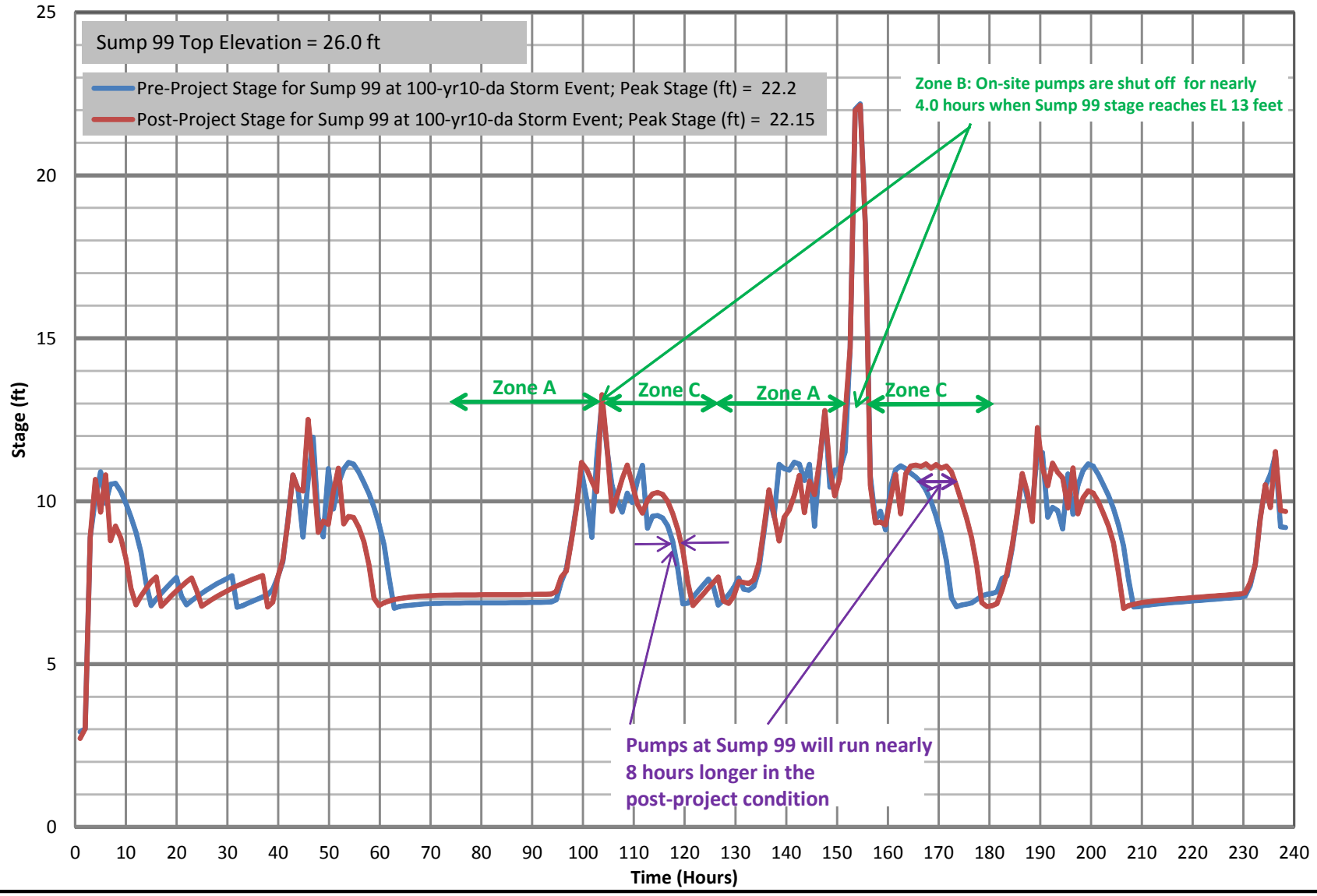
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9E_Comparison of Pre and Post-Project Stage at Sump 99 for 100-yr 24-hr storm event _20130905_V1.mxd 9/4/2013 3:05:54 PM jbuchanan

FIGURE 9E



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT SUMP 99 FOR 100-YR 10-DAY STORM EVENT

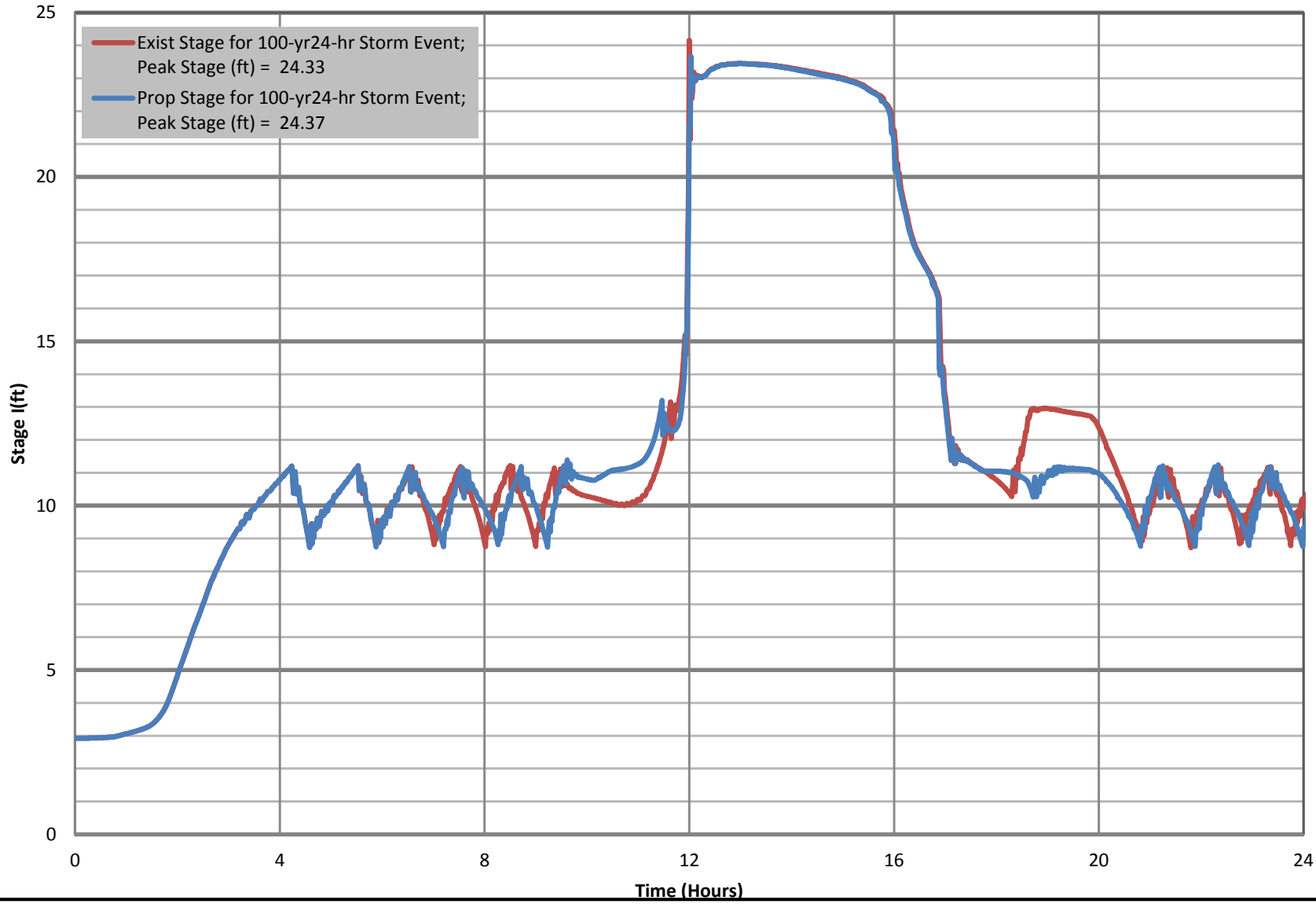
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_9F_Comparison of Pre and Post-Project Stage at Sump 99 for 100-yr 10-day storm event _20130905_V1.mxd 9/4/2013 3:06:10 PM jbuchanan

FIGURE 9F



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT NODE 399 FOR 100-YR 24-HR STORM EVENT

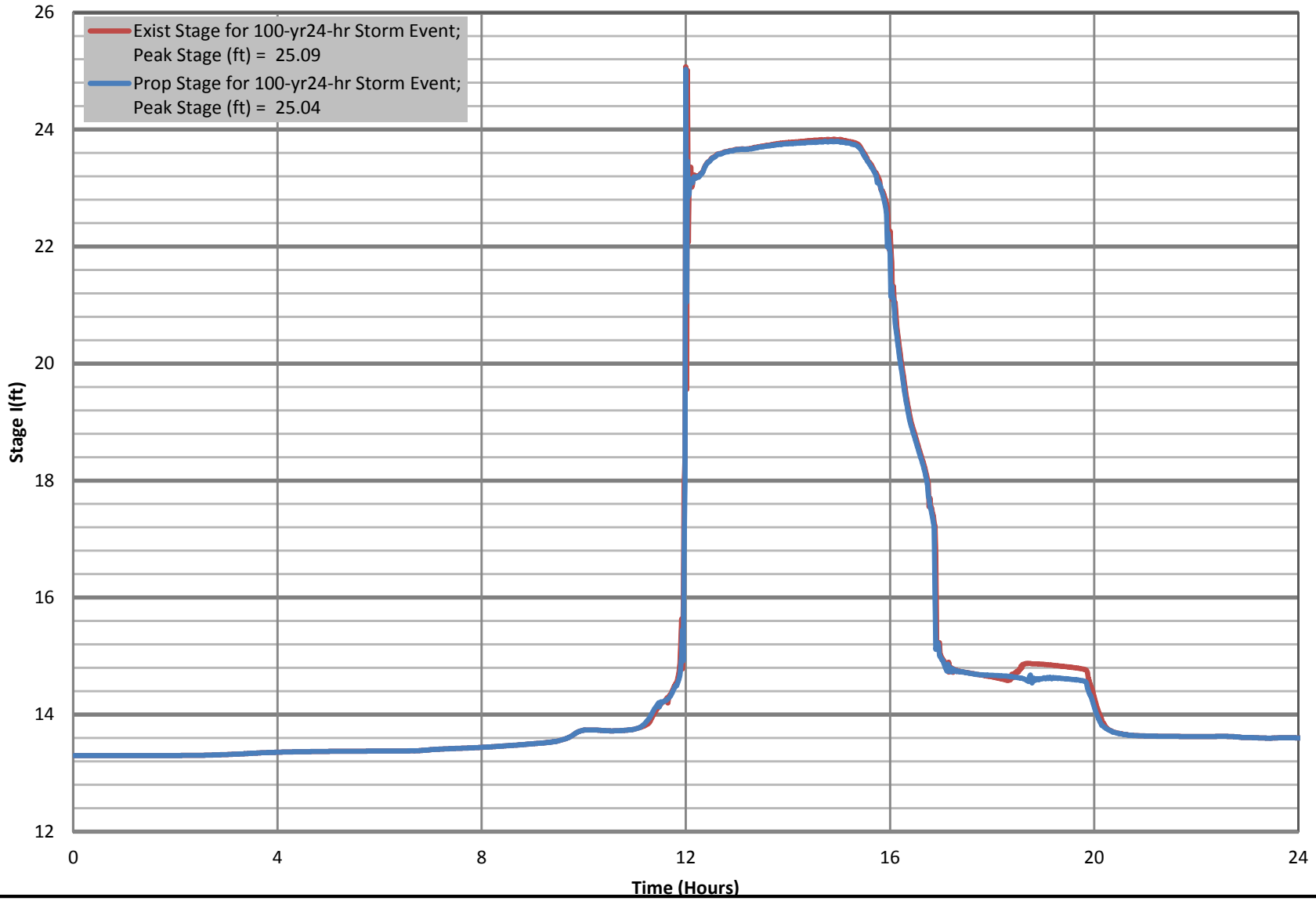
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_10A_Comparison of Pre and Post-Project Stage at Node 399 at 100-yr 24-hr Storm Event_20130905_V1.mxd 9/4/2013 3:06:29 PM jbuchanan

FIGURE 10A



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT NODE 301 FOR 100-YR 24-HR STORM EVENT

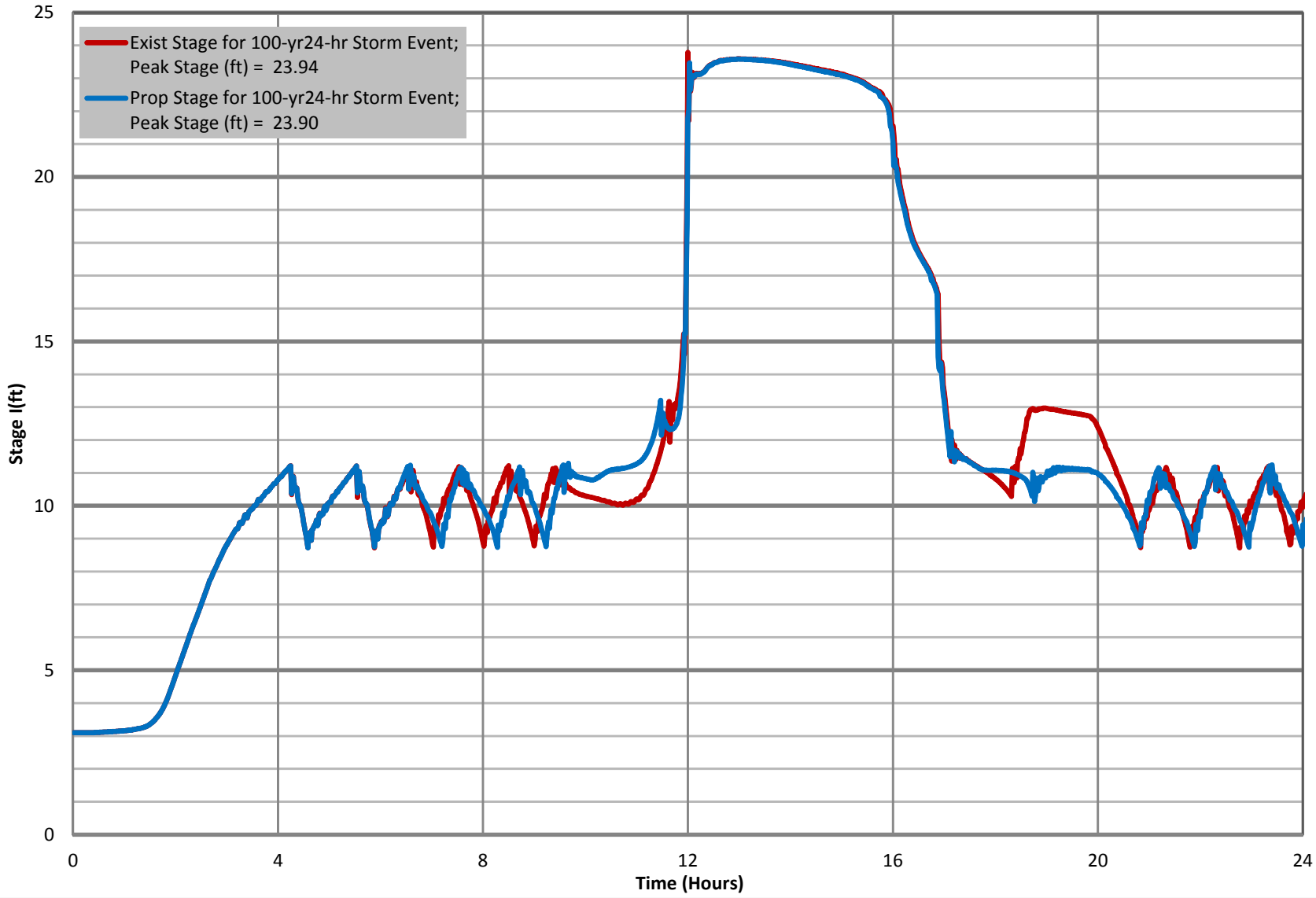
SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_10B_Comparison of Pre and Post-Project Stage at Node 301 for 100-yr 24-hr Storm Event_20130905_V1.mxd 9/4/2013 3:06:40 PM jbuchanan

FIGURE 10B



ENCORE MCKINLEY VILLAGE, LLC

COMPARISON OF PRE AND POST-PROJECT STAGE AT NODE 300 FOR 100-YR 24-HR STORM EVENT

SACRAMENTO, CA
SEPTEMBER, 2013

PRELIMINARY

WOOD RODGERS

J:\1000-s\1262-McKinleyVillage\McKinley_Village\GIS\Tasks\Report\Submitted_20130905\Fig_10C_Comparison of Pre and Post-Project Stage at Node 300 for 100-yr 24-hr Storm Event_20130905_V1.mxd 9/4/2013 3:06:52 PM jbuchanan

FIGURE 10C

APPENDICES

APPENDIX A
Proposed On-Site Grading Plan

PROPOSED GRADING PLAN

McKINLEY VILLAGE

ENCORE McKINLEY VILLAGE, LLC

SACRAMENTO CALIFORNIA

SEPTEMBER, 2013

LEGEND

- BIORETENTION BASIN
- HYDROMODIFICATION BASIN
- REAR DRAINING LOTS
- DIRECTION OF DRAINAGE
- DRAIN SWALE
- EXISTING GRADE ELEVATION
- PROPOSED GRADE ELEVATION
- PAD ELEVATION
- EXISTING CONTOUR
- BOUNDARY LINE
- RAIL ROAD

100' 50' 0 100'

SCALE: 1" = 100'

SUTTER'S LANDING REGIONAL PARK 001-0170-018

SUTTER'S LANDING REGIONAL PARK 001-0170-026

I-80 FREEWAY BUSINESS LOOP

FUTURE 12" DIA CITY OF SACRAMENTO SURGE PIPE

30.00'

UNION PACIFIC R/R

PROPOSED 40TH STREET EXTENSION

LANNAT ST.

ALHAMBRA BLVD

B ST

32ND ST

EX. PARKING LOT

APPENDIX A

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

APPENDIX B
Record Drawings of Sump 99, From Drainage Project No. 14 (1966)
(Electronic Files Only)

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

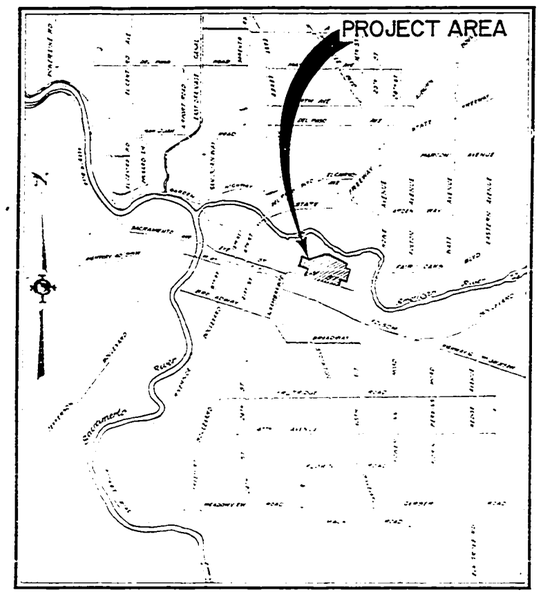
PLANS

FOR THE CONSTRUCTION OF

DRAINAGE FACILITIES

AND

DRAINAGE PUMPING PLANT



VICINITY MAP

INDEX TO PLANS

GENERAL NOTES

1. ALL ELEVATIONS ON THE PLANS ARE U.S.G.S. DATUM.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ASCERTAIN THE EXACT LOCATION OF ALL UTILITIES AND SERVICES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND FOR ANY DAMAGE TO ANY AND ALL UTILITIES AND SERVICES DURING THE PROSECUTION OF THE WORK.
4. ALL MANHOLES TO BE SET FLUSH WITH EXISTING FINISHED GRADE
5. EXISTING STORM DRAINAGE FACILITIES IN THE PROJECT AREA MUST BE MAINTAINED IN OPERATING CONDITION, EXCEPT WHERE OTHERWISE NOTED, UNTIL THE PIPE LINES AND THE PUMPING STATION CONSTRUCTED UNDER THIS CONTRACT ARE OPERATIVE.
6. TWO-WAY TRAFFIC MUST BE MAINTAINED ON "H" STREET, "C" STREET AND ELVAS AVENUE AT ALL TIMES, UNLESS PERMISSION TO INTERRUPT TRAFFIC IS GIVEN BY THE ENGINEER. SEE SPECIFICATIONS FOR TRAFFIC CONTROL AND CONSTRUCTION SEQUENCE FOR OTHER STREETS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFETY DEVICES, BARRICADES AND CONTROL OF TRAFFIC AT THE CONSTRUCTION SITE. THE CITY OF SACRAMENTO WILL BE RESPONSIBLE FOR DETOURING TRAFFIC AS NECESSARY AROUND THE CONSTRUCTION SITE, UPON 48 HOUR NOTICE TO THE CITY TRAFFIC ENGINEER. SAFETY DEVICES AND BARRICADES FOR DETOURS WILL BE FURNISHED BY THE CITY OF SACRAMENTO.
8. THE CONTRACTOR SHALL GIVE 24 HOUR NOTICE TO EACH HOUSE WHOSE DRIVEWAY ACCESS WILL BE CLOSED TO PREVENT VEHICLES FROM BEING STRANDED.
9. MAXIMUM LENGTH OF OPEN TRENCH AT ANY WORKING LOCATION SHALL BE A SINGLE BLOCK FROM ONE STREET INTERSECTION TO ANOTHER, EXCEPT THAT WHERE INTERSECTIONS ARE LESS THAN 300 FEET APART (CENTER TO CENTER) OPEN TRENCH MAY BE TWO BLOCKS LONG, NOT EXCEEDING 800 FEET TOTAL LENGTH.
10. TEMPORARY PAVEMENT REPLACEMENT SHALL CONSIST OF 10 INCHES OF AGGREGATE BASE PLUS ONE INCH OF ASPHALT CONCRETE
11. PIPE CONSTRUCTION WILL NOT BE PERMITTED IN STREET FRONTAGES OF THEODORE JUDAH SCHOOL DURING REGULAR SCHOOL SESSIONS, UNLESS OTHERWISE PERMITTED BY THE ENGINEER.

LEGEND

- EXISTING STREET LIGHT CONDUIT (Light Pole, Transformer)
- EXISTING FIRE ALARM CONDUIT (Pull box)
- EXISTING SEWER
- EXISTING WATER
- EXISTING GAS
- EXISTING CULVERT
- EXISTING UNDERGROUND TELEPHONE CABLE
- EXISTING WATER VALVE
- FIRE HYDRANT
- POWER POLE
- BENCHMARK
- EXISTING DROP INLET
- DROP INLET TO BE CONSTRUCTED
- R/W
- PROPOSED DRAIN LINE AND MANHOLE
- DISTRICT BOUNDARY
- CONNECT EXISTING GUTTER DRAIN OR GUTTER DRAIN LEAD TO NEW MANHOLE WITH 6"CR 8"VC PIPE AT A MINIMUM SLOPE OF 0.0025, UNLESS OTHERWISE NOTED. (Proposed System, Existing System, Existing pipe to be plugged at Manhole)
- EXISTING DRAIN

PREPARED BY:

SPINK ENGINEERING COMPANY
ENGINEERS - PLANNERS - SURVEYORS

For stand Pipe See Sheet 59

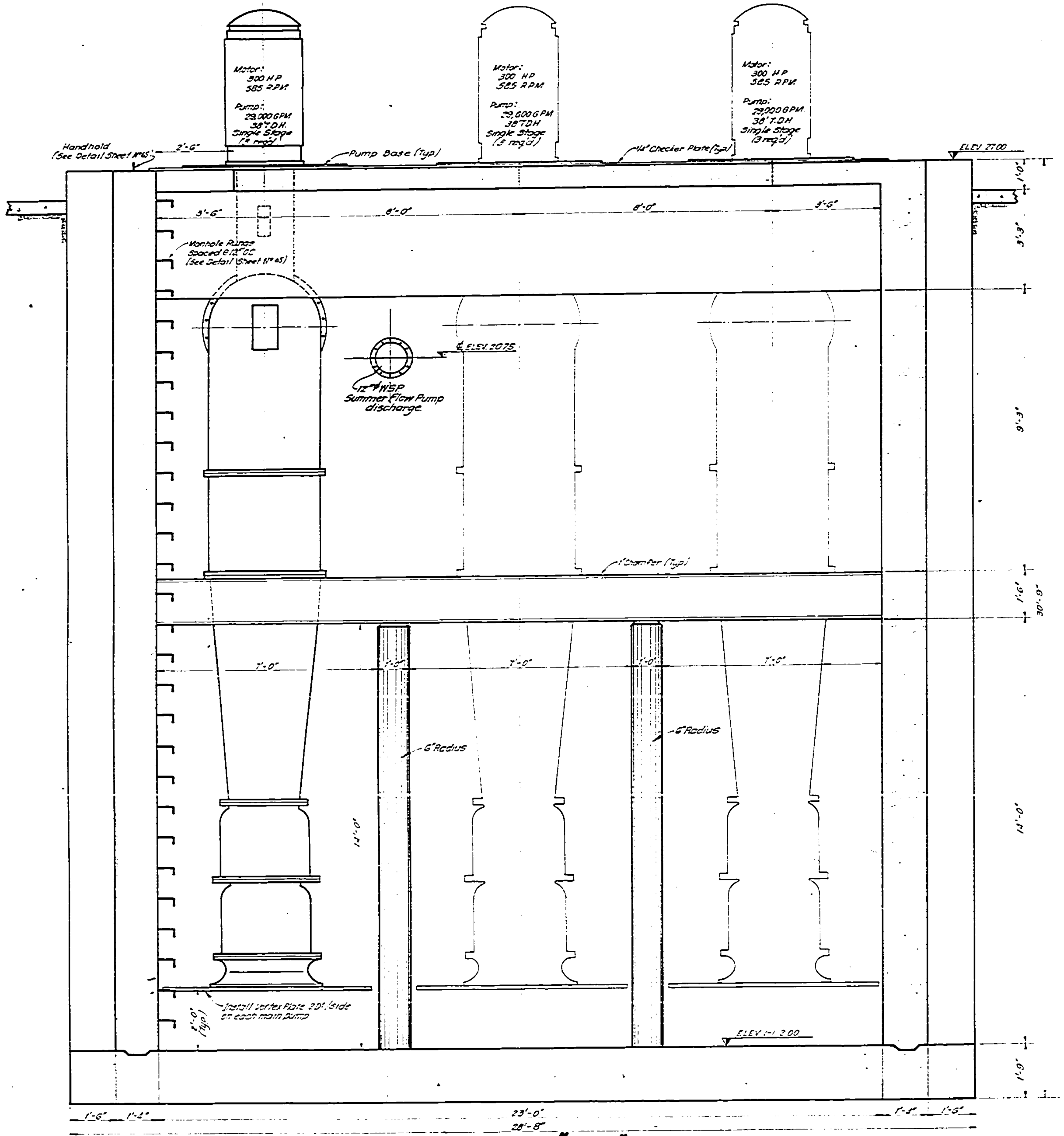
For Capacity of Sump in gals See Sheet 59

SUBMITTED: Robert E Young
SPINK ENGINEERING COMPANY
Robert E. Young R.C.E. 11564

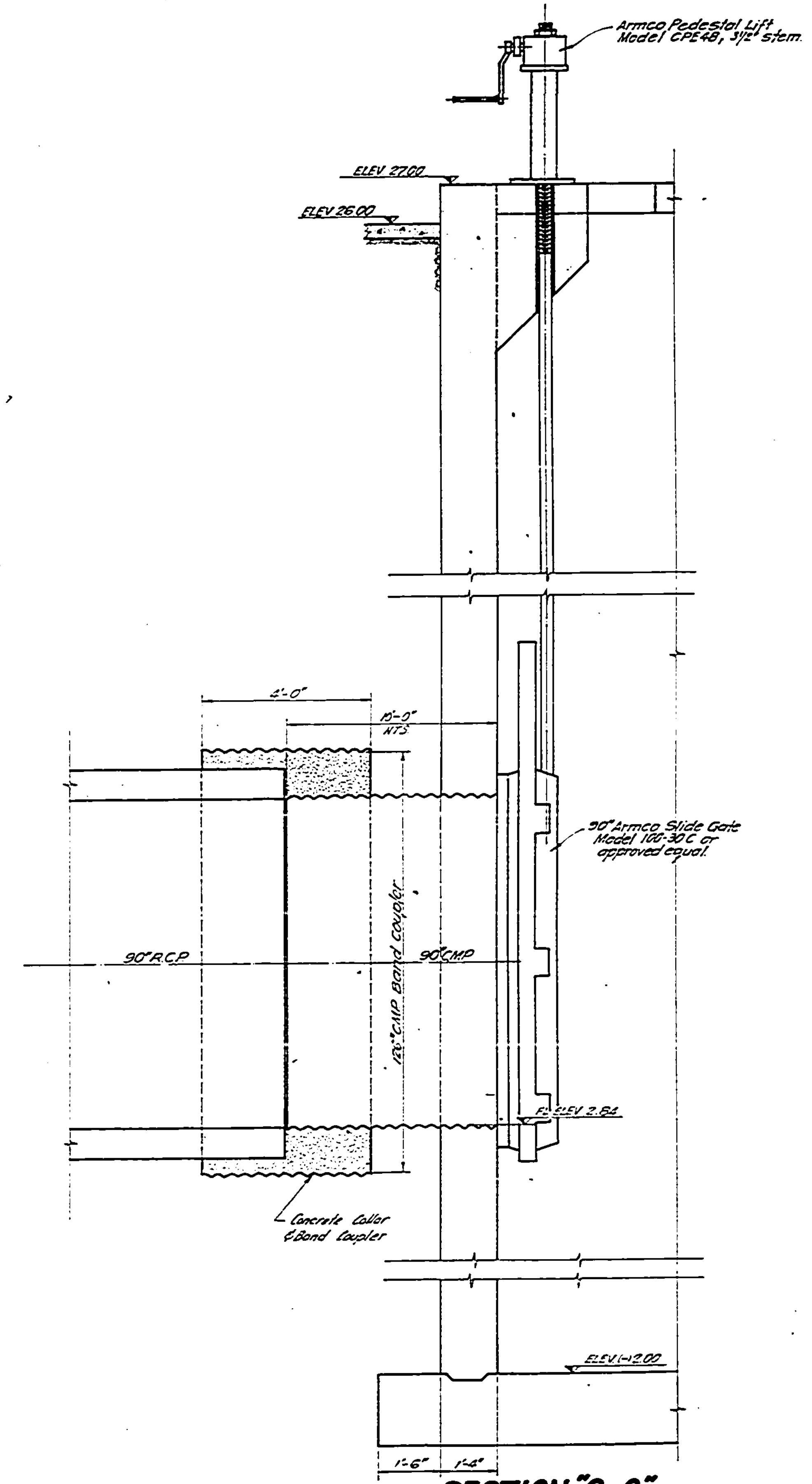
APPROVAL RECOMMENDED: John R Varozza
John R. Varozza,
Assistant City Engineer - Design, R.C.E. 9872

APPROVED: C Jennings
J. Carl Jennings
City Engineer, R.C.E. 7961

SUMP 99



SECTION "B-B"
SCALE: 1/2" = 1'-0"



SECTION "C-C"
SCALE: 1/2" = 1'-0"

DESIGNED	BY T.D.
DRAWN	BY G.Z.
CHECKED	BY REY

REVISION	DATE	DESCRIPTION	BY	APPD

BENCH MARK ELEVATION ______ DATUM ______
DESCRIPTION:

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

FIELD BOOKS
F.B. NO. ______
F.B. NO. ______
F.B. NO. ______

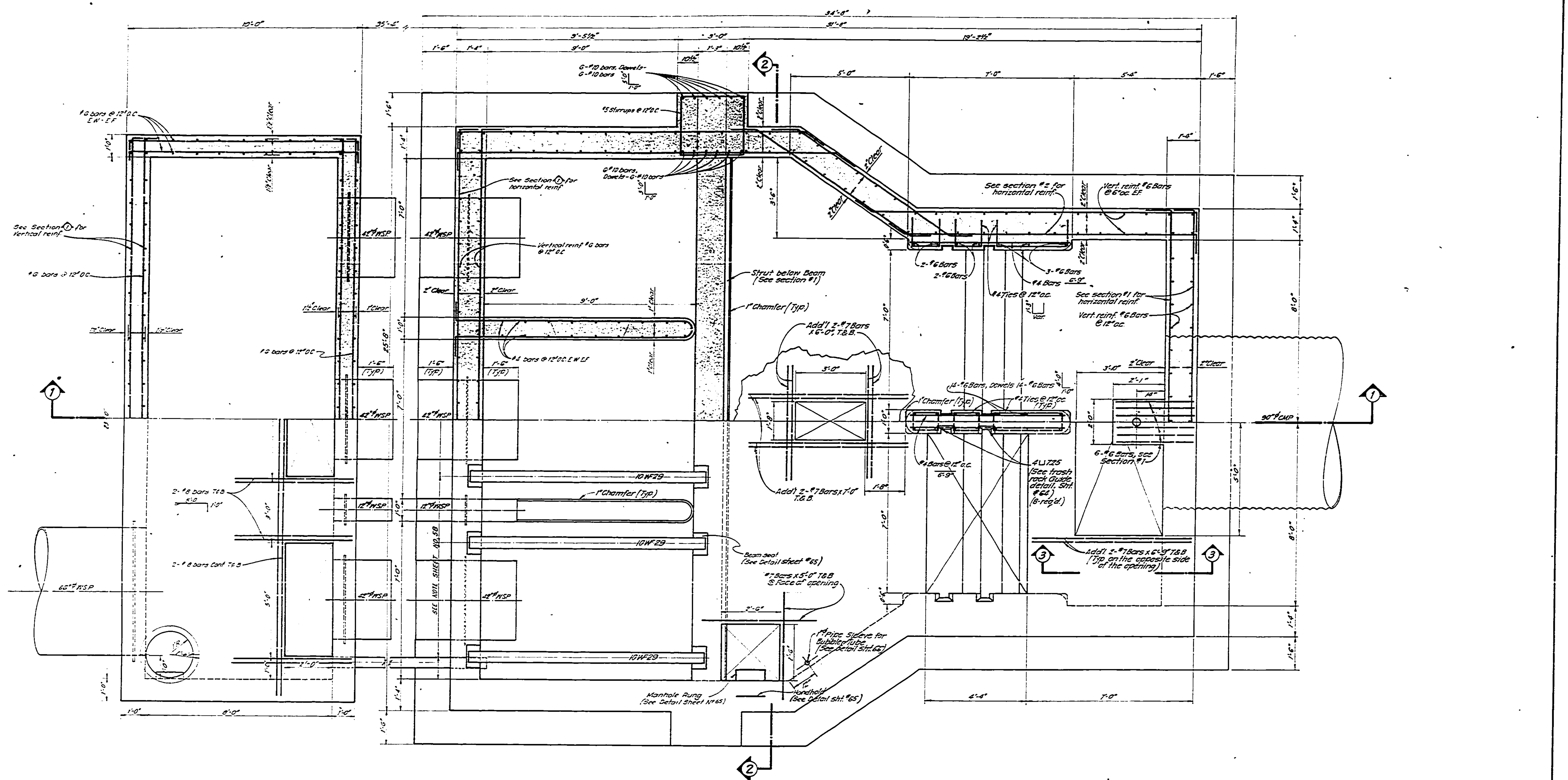
SCALE:

FILE NO.

EQUIPMENT SECTIONS

SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS

SHEET 60 OF 68

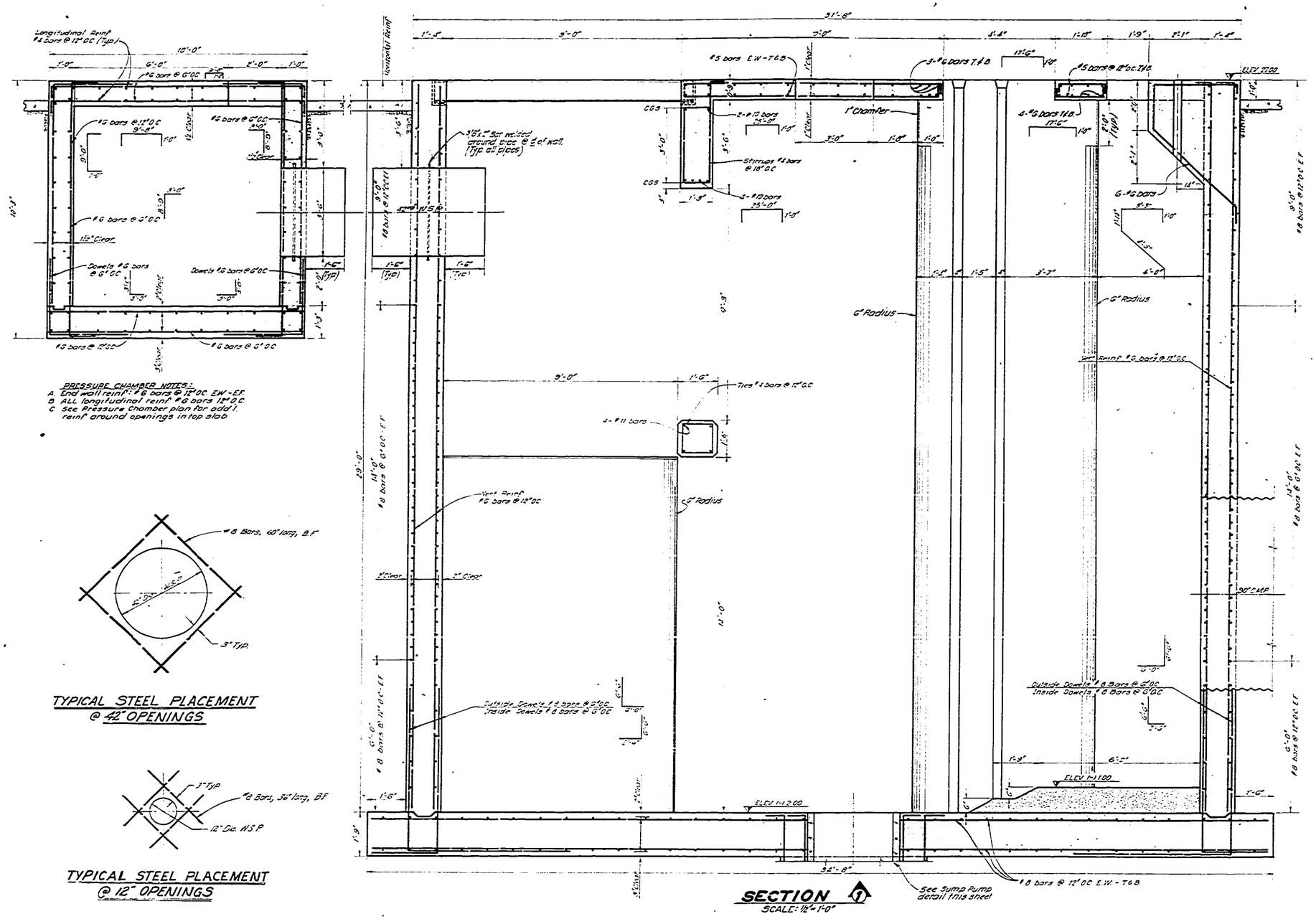


NOTE: BARS ARE SHOWN SEPARATED FOR VISUAL CONVENIENCE ONLY.

STRUCTURAL PLAN

SCALE: 1/2" = 1'-0"

DESIGNED BY TD DRAWN BY GZ CHECKED BY BEY	REVISION DATE DESCRIPTION BY APPD	BENCH MARK ELEVATION DATUM DESCRIPTION:	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE: FILE NO.	STRUCTURAL PLAN	SPINK ENGINEERING COMPANY ENGINEERS PLANNERS SURVEYORS	SHEET 61 OF 68

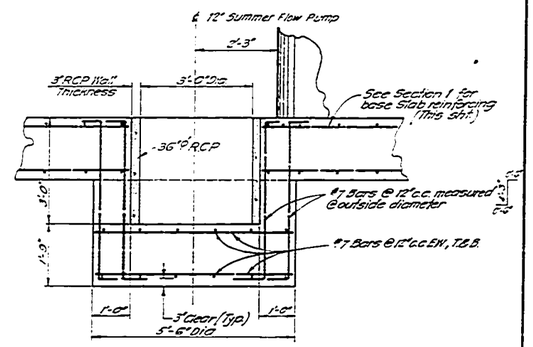


PRESSURE CHAMBER NOTES:-
A. End wall reinf: #6 bars @ 12" OC. EW - EF.
B. ALL longitudinal reinf. #6 bars 12" O.C.
C. See Pressure Chamber plan for addt'l. reinf. around openings in top slab.

TYPICAL STEEL PLACEMENT @ 42" OPENINGS

TYPICAL STEEL PLACEMENT @ 12" OPENINGS

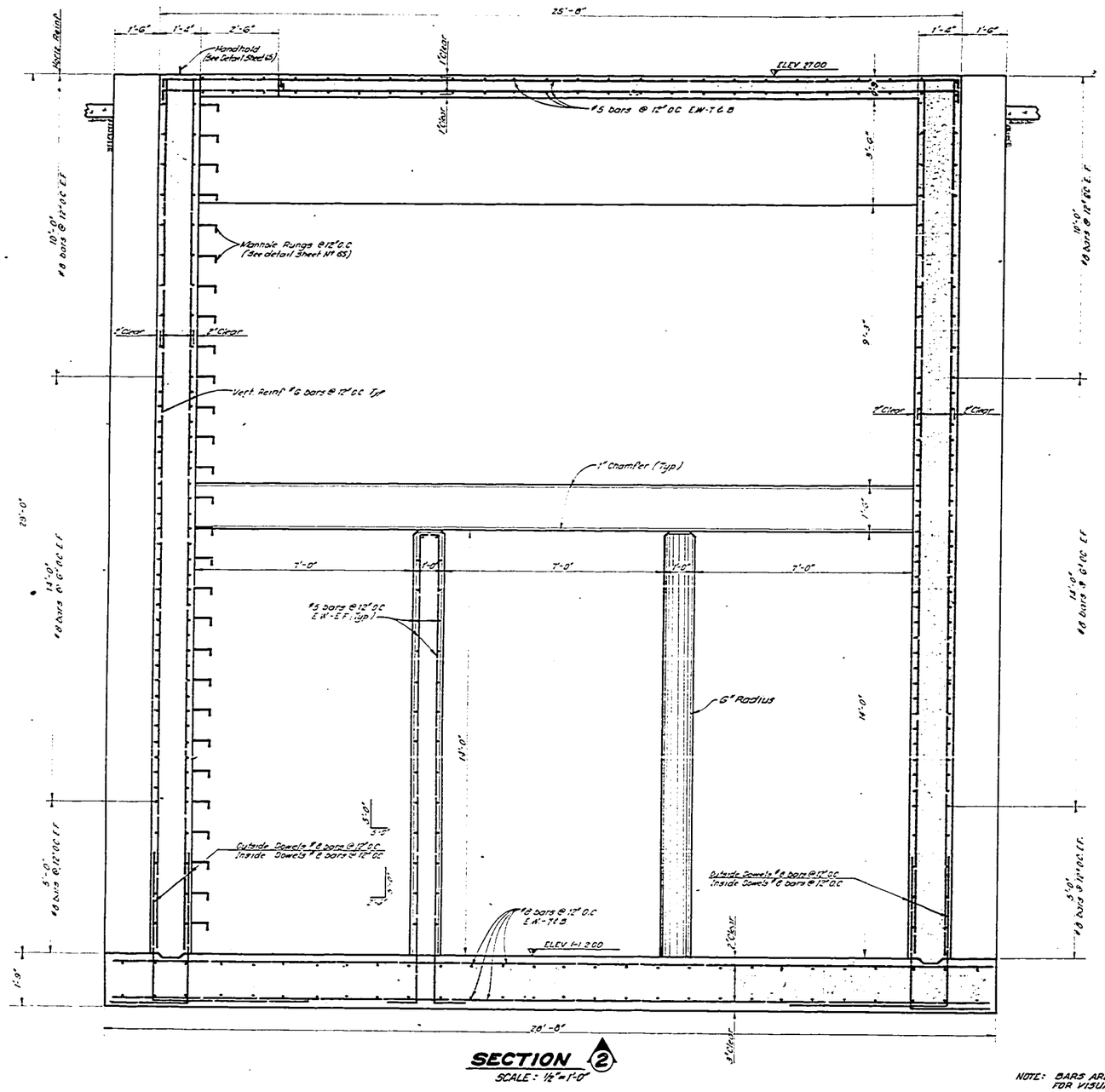
SECTION 1
SCALE: ½" = 1'-0"



12" SUMMER PUMP SUMP DETAIL
SCALE: 1½" = 1'-0"

/sump ww/scanned/p23-1-1966-162.tif

DESIGNED BY TD DRAWN BY GZ CHECKED BY REV	REVISION DATE DESCRIPTION BY APPD	BENCH MARK ELEVATION DATUM DESCRIPTION:	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE: FILE NO.	STRUCTURAL SECTION	SPINK ENGINEERING COMPANY ENGINEERS PLANNERS SURVEYORS	SHEET 62 OF 68



SECTION 2
SCALE: 1/2" = 1'-0"

NOTE: BARS ARE SHOWN SEPARATED FOR VISUAL CONVENIENCE ONLY.

/dump 99/Scanswg/p23-1-1966-1163.tif

DESIGNED BY TO
DRAWN BY GZ
CHECKED BY REV

REVISION	DATE	DESCRIPTION	BY	APPD.

BENCH MARK ELEVATION DATUM
DESCRIPTION:

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

FIELD BOOKS
F.B. NO.
F.B. NO.
F.B. NO.

SCALE:

FILE NO.

STRUCTURAL SECTIONS

SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS
801 10th STREET SACRAMENTO CALIFORNIA

SHEET 63 OF 68

NOTE: The power cord must attach to the side of the frame that the motor end of the hoist points towards.

FRONT VIEW
LOOKING DOWNSTREAM

SECTION A-A

HOIST FRAME DETAIL
NOT TO SCALE

DETAIL OF TRASH RACK
NOT TO SCALE

TYPICAL STRUT CONNECTIONS
Scale: 1"-1'-0"

TOP & BOTTOM

MID-POINT

TRASH RACK GUIDE DETAIL
NOT TO SCALE

CONNECTION DETAIL
Scale: 1"-1'-0"

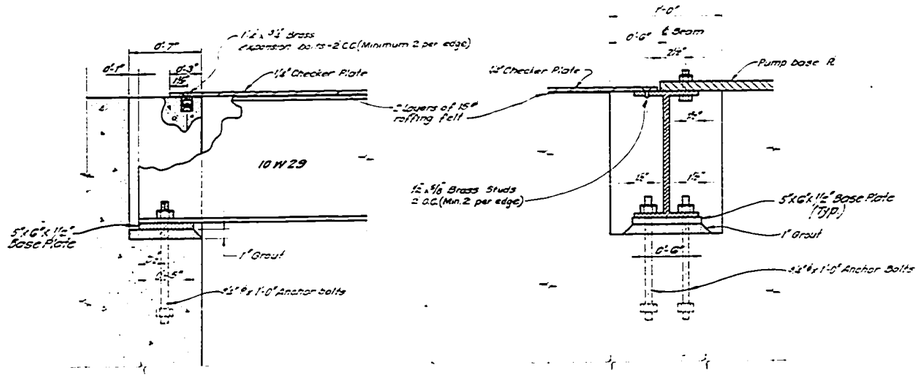
BASE PLATE DETAIL
Scale: 1½"-1'-0"

SECTION D-D
Scale: 1"-1'-0"

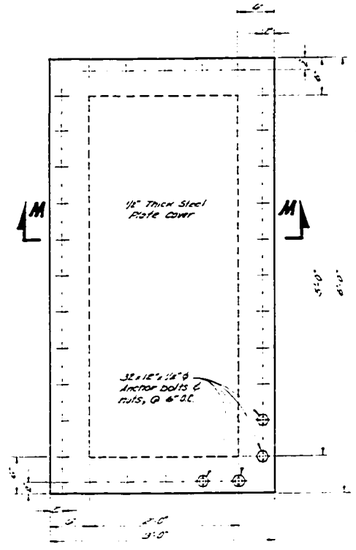
TRASH RACK TOE DETAIL
Scale: 2"-1'-0"

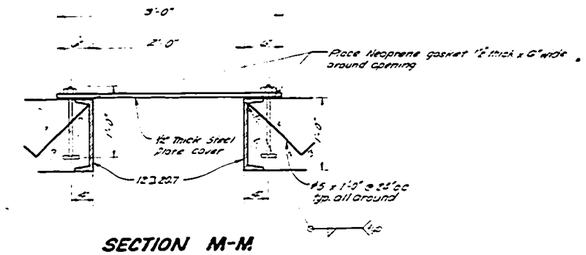
Sump 99/Scandwg/p25-1-1966-164.tif

DESIGN ... DRAWN ... CHECK ...	REVISION DATE / DESCRIPTION / BY / APPD	BENCH MARK ...	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS ...	SCALE: As Shown FILE NO	DETAILS	SPINK ENGINEERING COMPANY	SHEET 64 OF 68



BEAM SEAT DETAIL
NO SCALE

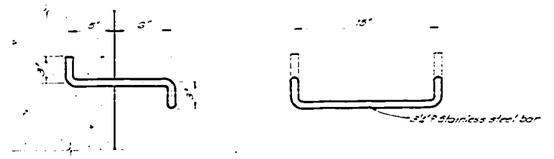




SECTION M-M

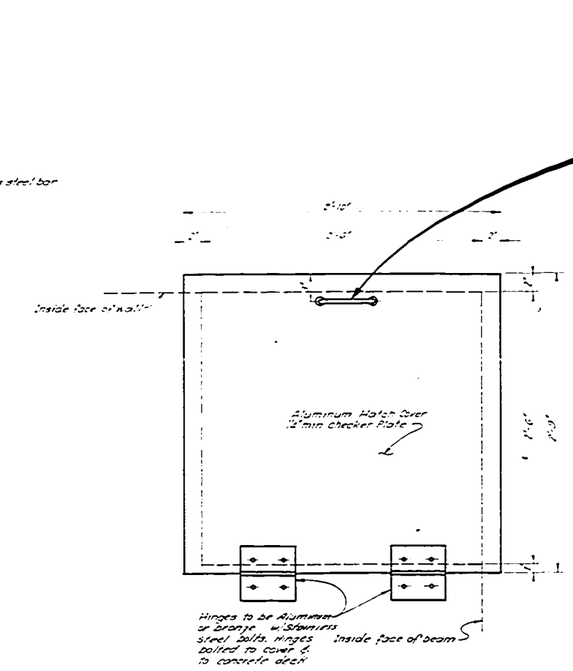
PRESURE CHAMBER COVER

PLATE DETAIL
SCALE: 1"=1'-0"

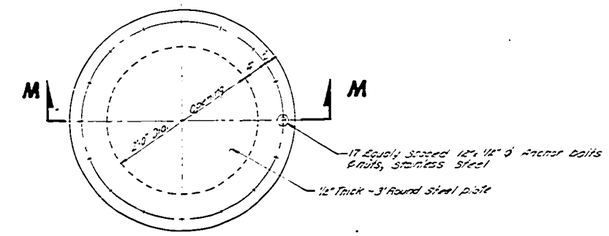


MANHOLE RUNG DETAIL
SCALE: 1½"=1'-0"

HANDHOLD
NO SCALE



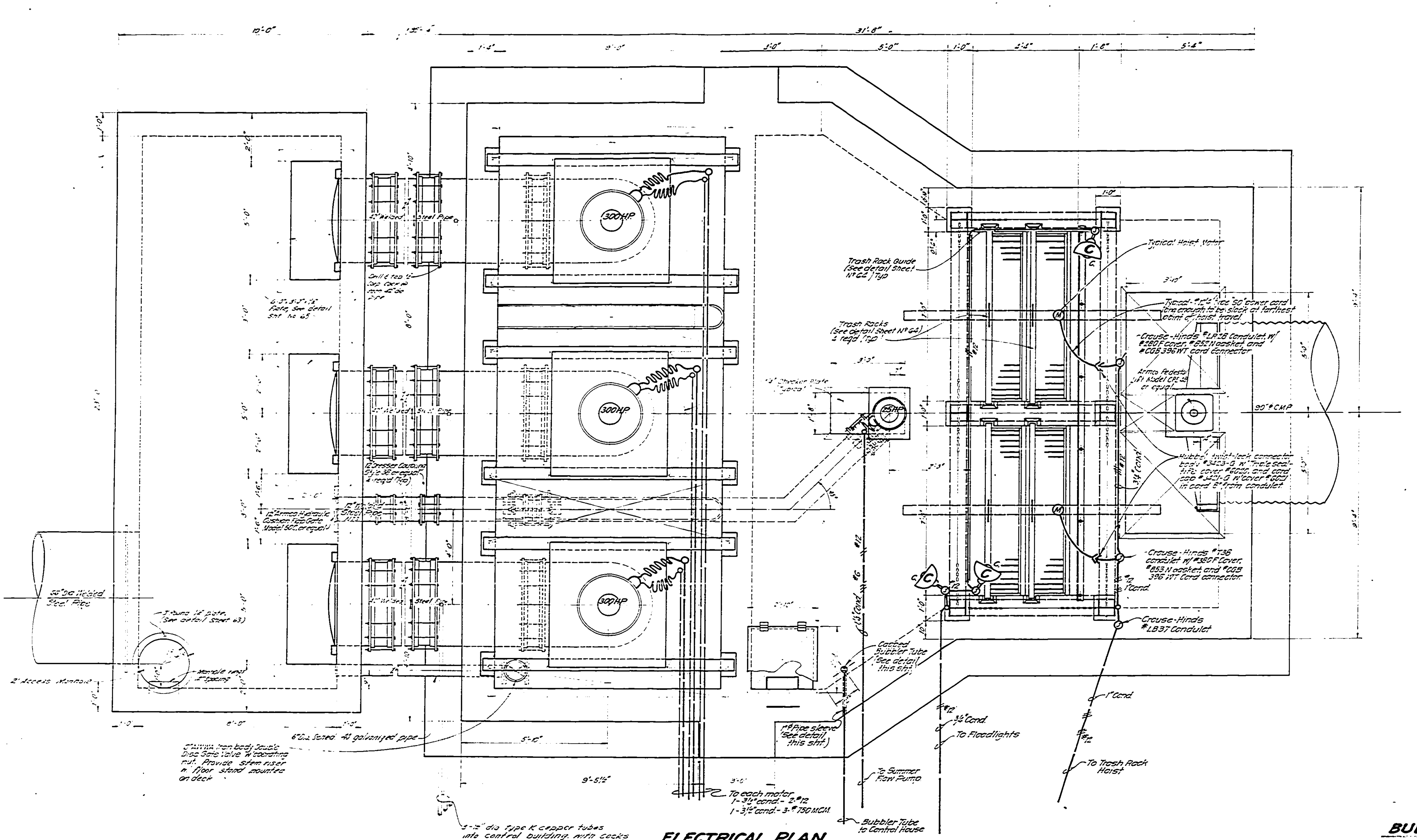
HATCH COVER
NO SCALE



ACCESS MANHOLE

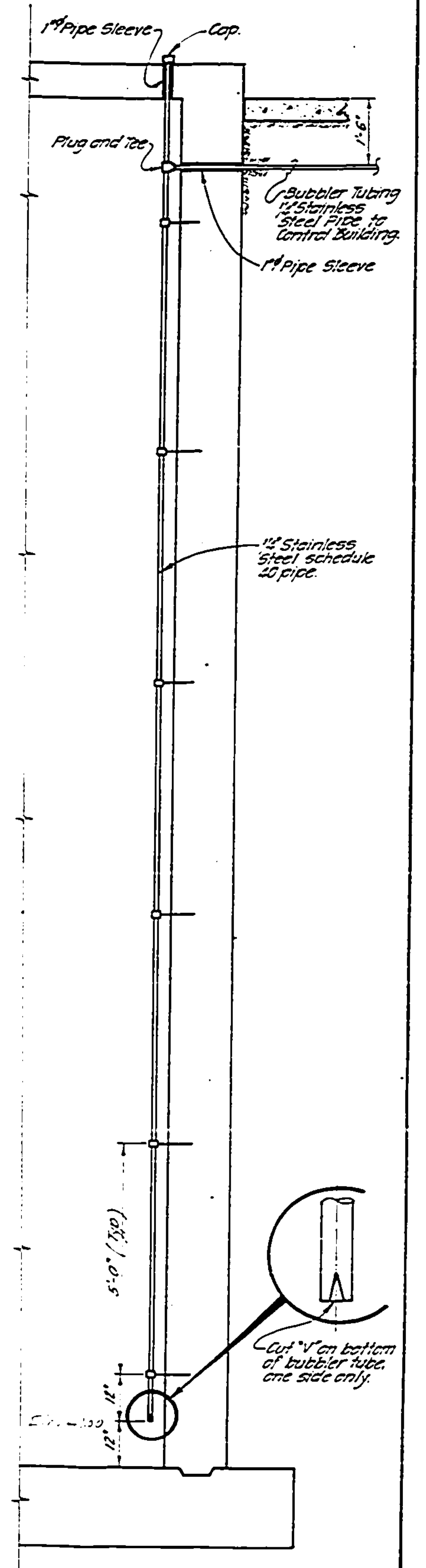
/sump 99/scanned/p65-1-1966-1165.tif

DESIGNED BY TD DRAWN BY GZ CHECKED BY REY	REVISION DATE DESCRIPTION BY APPD	BENCH MARK ELEVATION DATUM DESCRIPTION:	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE: FILE NO.	DETAILS	SPINK ENGINEERING COMPANY ENGINEERS PLANNERS SURVEYORS 801 16th STREET SACRAMENTO CALIFORNIA	SHEET 65 OF 68



ELECTRICAL PLAN

SCALE: 1/2" = 1'-0"

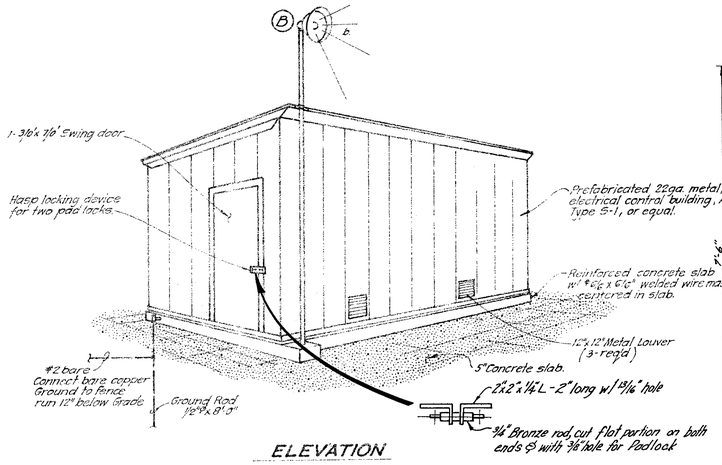


BUBBLER TUBE DETAIL

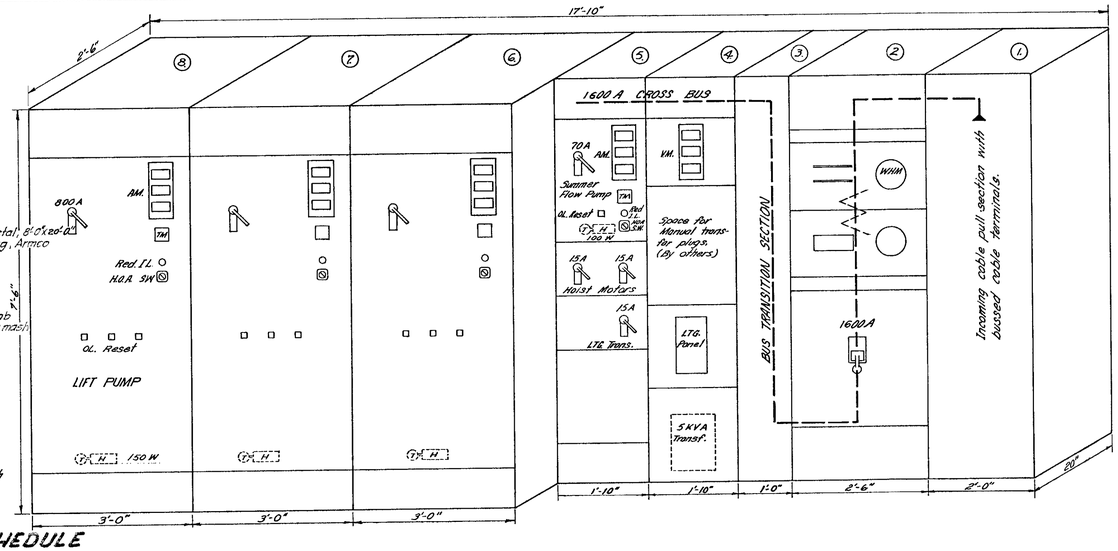
SCALE: 1/2" = 1'-0"

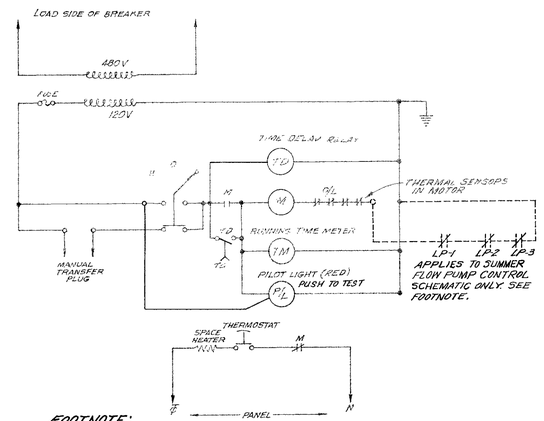
/Sump 99/Scandwg/p25-1-1966-1/66.tif

DESIGNED BY ____ DRAWN BY G.E. CHECKED BY ____	REVISION DATE DESCRIPTION BY APPD.	BENCH MARK DESCRIPTION ELEVATION ____ DATUM ____	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. ____ F.B. NO. ____ F.B. NO. ____	SCALE: FILE NO.	ELECTRICAL PLAN	SPINK ENGINEERING COMPANY	SHEET 66 OF 68



ELEVATION





FOOTNOTE:
Add 1 NC auxiliary contact to M contactor of starters for lift pumps 1, 2 & 3, Connect all in series with M contactor coil of Summer Flow Pump, (see one-line diagram.

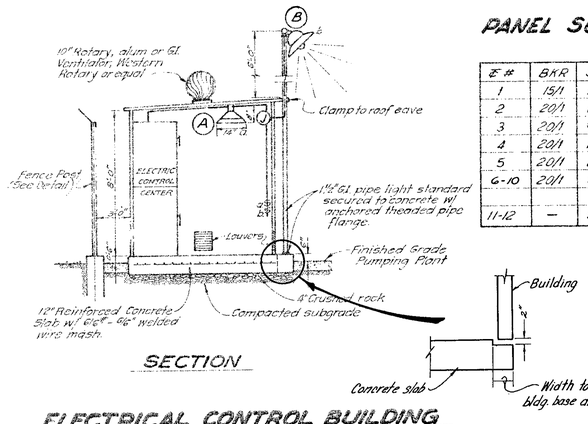
PUMP MOTOR CONTROL WIRING SCHEMATIC

PANEL SCHEDULE

CKT #	BKR	SERVES
1	15/1	HEATERS
2	20/1	BUBBLETROL
3	20/1	Φ IN BLDG.
4	20/1	LIGHTS @ BLDG.
5	20/1	LIGHTS @ EQUIP.
6-10	20/1	SPARES
11-12	—	SPACES

ELECTRIC SERVICE CONTROL CENTER

SCALE: 3/4" = 1'-0"



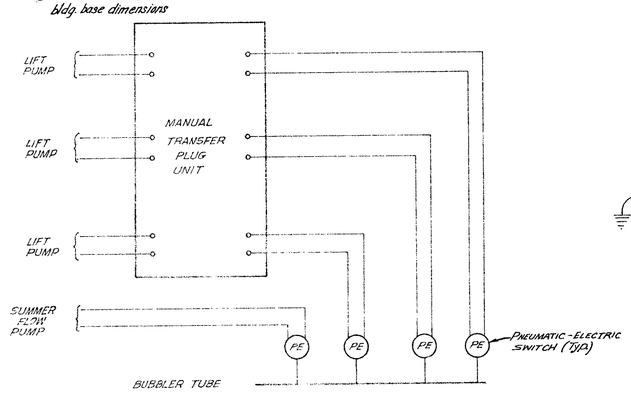
SECTION

ELECTRICAL CONTROL BUILDING

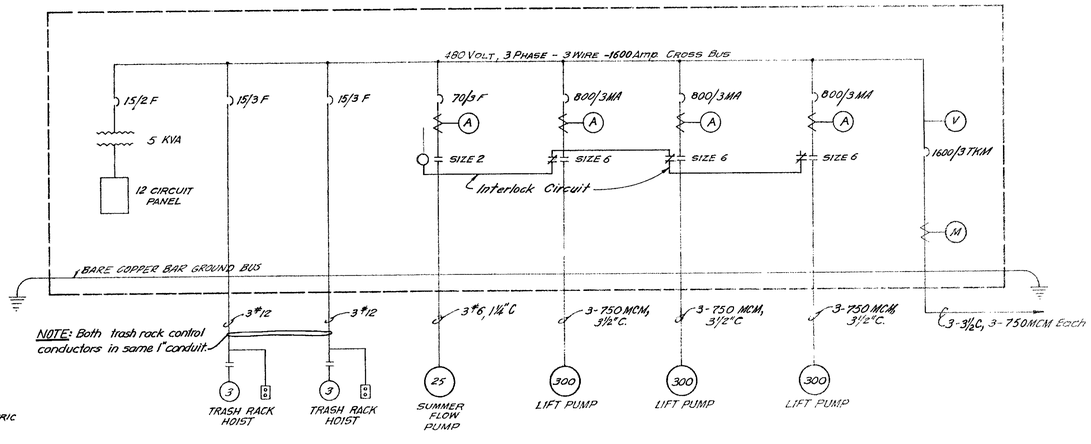
NO SCALE

FIXTURE SCHEDULE

Symbol	Description
A	R.L.M. STANDARD DOME, DETACHABLE REFLECTOR, CEILING MOUNTING H000, 150 W., BENJAMIN CAT. No. C-1802.
B	OPEN TYPE FLOODLIGHT, PORCELAIN ENAMELED WITH INNER ALUMINUM REFLECTOR, WITH SLIP-FITTER FOR 1½" PIPE, 300 W., BENJAMIN CAT. No. 5715
C	ENCLOSED FLOODLIGHT, STIPPLED GLASS LENS, ALUMINUM CONCENTRATING REFLECTOR, WALL BRACKET MOUNTING, 200 W., BENJAMIN CAT. No. 5-6023-E.



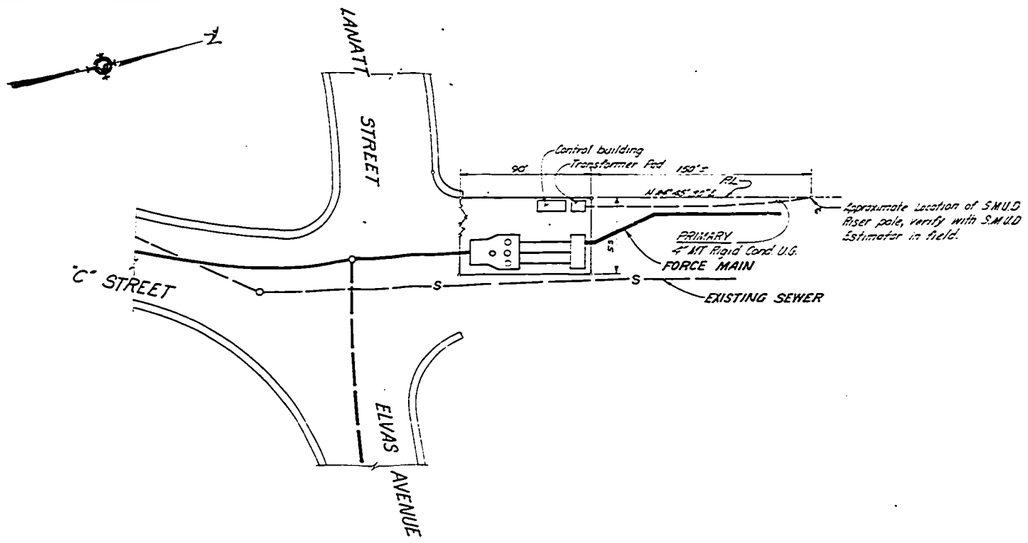
LIQUID LEVEL AND SEQUENCE CONTROL



ONE LINE DIAGRAM

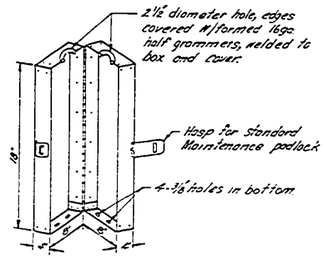
/Sump 99/Scandwg/p23-7-1966-1/67.tif

DESIGNED BY C.M.								BENCH MARK ELEVATION DESCRIPTION	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. No. F.B. No. F.B. No.	SCALE AS NOTED FILE NO.	ELECTRICAL DETAILS	ENGINEERING COMPANY	SHEET 67 OF 68
DRAWN BY [illegible]														
REVISED BY C.M.														
								REVISION DATE APPROVED BY						



SITE PLAN

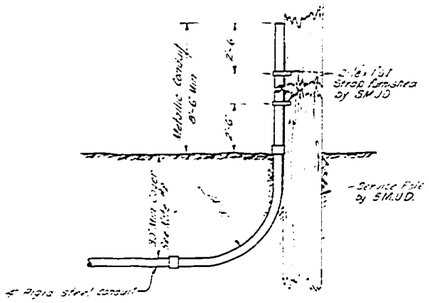
SCALE: 1"=50'-0"



SAFETY LOCK BOX FOR HOIST PENDANT PUSHBUTTON

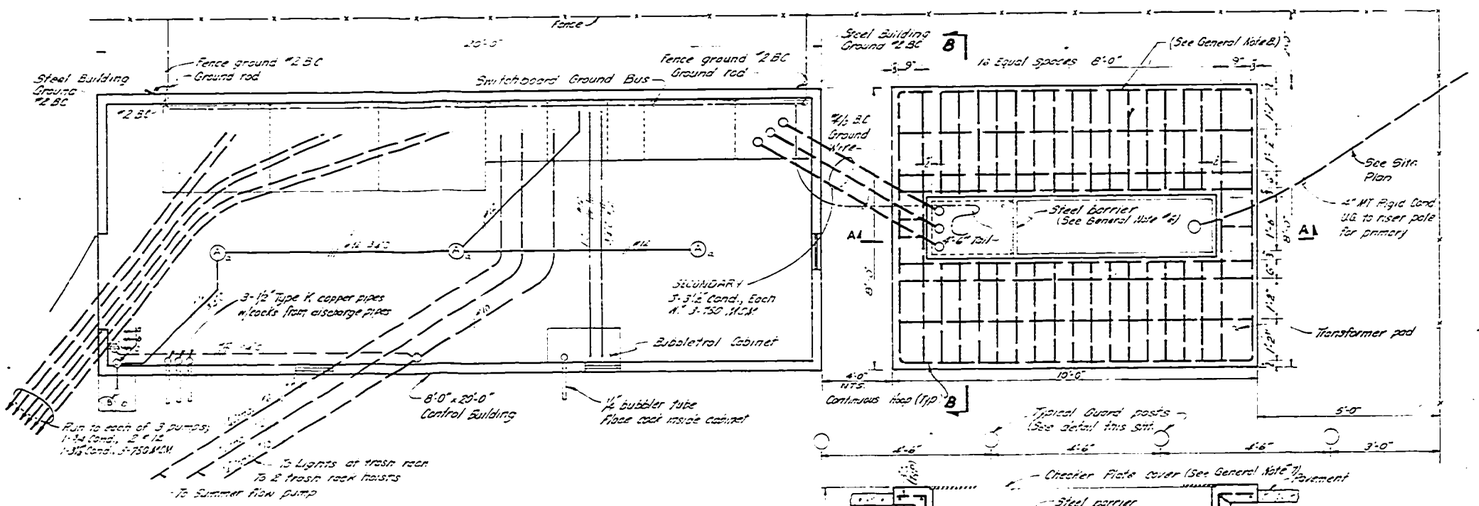
NO SCALE

Make of #12ga. galv. steel, spot welded, full length piano hinge on door. Bolt to flange of WF column with four 3/8" x 1" hex. head galv. steel screws. Paint 1 coat Rustoleum primer and 1 coat Rustoleum WP Aluminum paint.



GENERAL NOTES

1. CONCRETE SHALL BE PROPORTIONED AND PLACED PER S.M.U.D. ENGINEERING DEPARTMENT SPEC'S #913
2. CONDUIT SHALL BE PLACED WITH A MINIMUM COVER OF 30 INCHES OVER RIGID CONDUIT.
3. CONDUIT MATERIAL AND PLACEMENT SHALL MEET S.M.U.D ENGINEERING DEPARTMENT SPEC'S #911 & #912.
4. A 3/4" POLYPROPOLENE ROPE SHALL BE LEFT AS A "SLEEPER WIRE" IN THE PRIMARY CONDUIT.
5. TRANSFORMER INSTALLATION SHALL HAVE A 24" INCH CLEAR WORKING SPACE ON ALL SIDES.
6. BARRIER TO BE 12 GA. GALV. STEEL, W/1½"x1½"x¼" L FRAME, HELD BY 2-⅜" GALV. BOLTS INTO EXP ANCHORS EACH SIDE. DRILL 1-1" HOLE IN BARRIER FOR GROUND WIRE.
7. ¼" CHECKER PLATE, AS REQUIRED TO COVER ANY PART OF SECONDARY GUTTER NOT COVERED BY TRANSFORMER SECONDARY COMPARTMENT.
8. ALL REINFORCEMENT STEEL SHALL BE #4 DEFORMED BARS. DIMENSIONS TO BARS SHOWN ARE CENTER TO CENTER SPACING
9. TRANSFORMER PAD TO CONFORM TO S.M.U.D. DRAWING Nº B-372

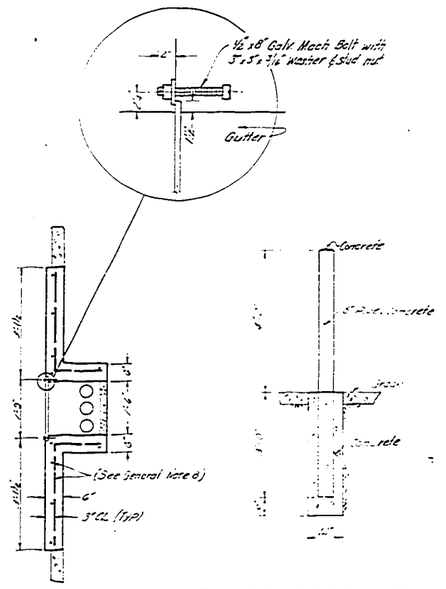


DETAIL M

SCALE: ½"=1'-0"

SECTION A-A

SCALE: ½"=1'-0"



SECTION B-B

SCALE: ½"=1'-0"

GUARD POST DETAIL

SCA...

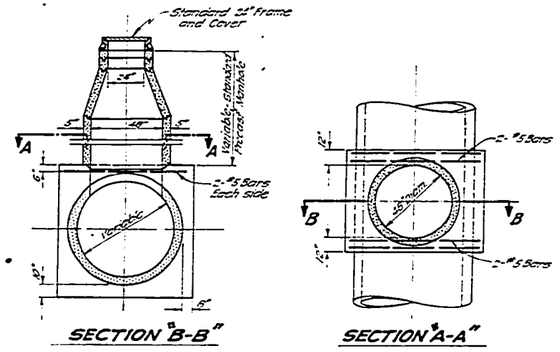
Sump ysacanawg/p23-1-1966-1/68.tif

DESIGNED BY C.M. DRAWN BY G.W. CHECKED BY R.E.V.	REVISION DATE DESCRIPTION BY APPD	BENCH MARK ELEVATION DATUM DESCRIPTION	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE HORIZONTAL 1"=50' VERTICAL 1"=5' FILE NO.	ELECTRICAL SITE PLAN AND DETAILS	SHEET 68 OF 68

N

-dump rrw3caaarw/p1--/-
1966-1/2.tif

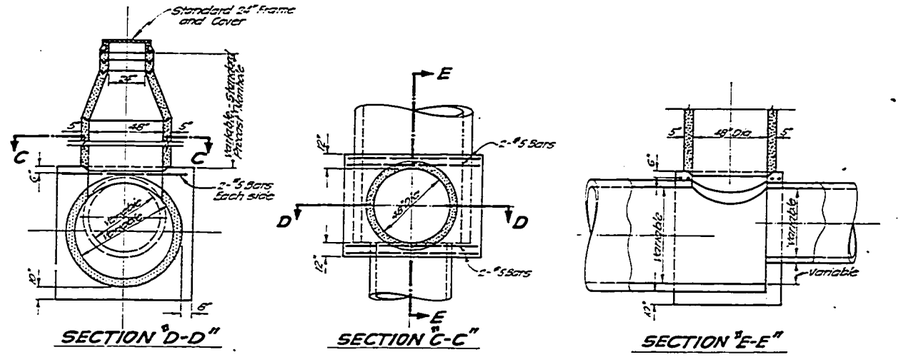
DESIGNED BY DRAWN BY CHECKED BY	REVISION DATE DESCRIPTION BY APPD.	BENCH MARK ELEVATION DATUM DESCRIPTION:	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE: 1" = 400' FILE NO.	LOCATION PLAN AND INDEX TO PLANS	SPINK ENGINEERING COMPANY ENGINEERS PLANNERS SURVEYORS 807 FIFTH STREET SACRAMENTO CALIFORNIA	SHEET 2 OF 68



SECTION "B-B" SECTION "A-A"

SPECIAL MANHOLE TYPE "A"

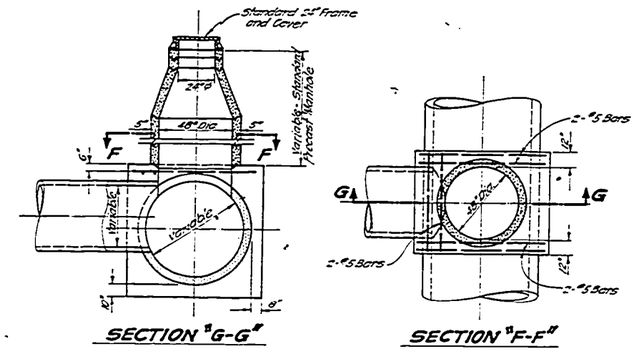
NO SCALE



SECTION "D-D" SECTION "C-C" SECTION "E-E"

SPECIAL MANHOLE TYPE "B"

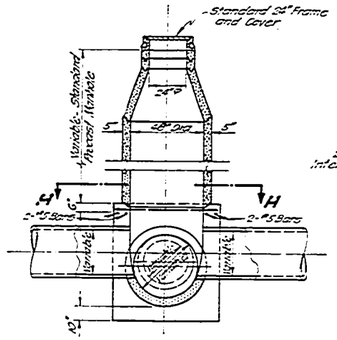
NO SCALE



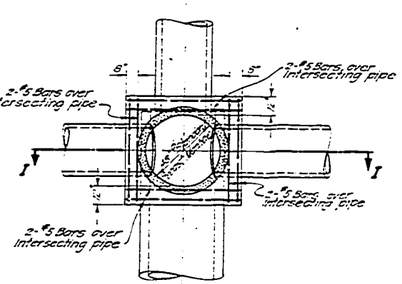
SECTION "G-G" SECTION "F-F"

SPECIAL MANHOLE TYPE "C"

NO SCALE



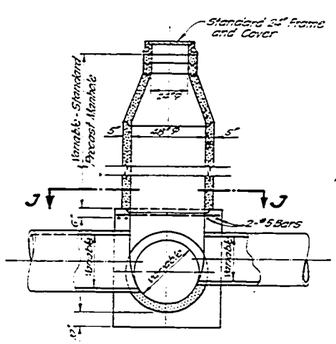
SECTION "I-I"



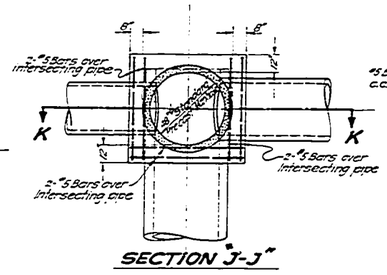
SECTION "H-H"

SPECIAL MANHOLE TYPE "D"

NO SCALE



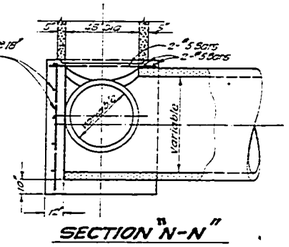
SECTION "K-K"



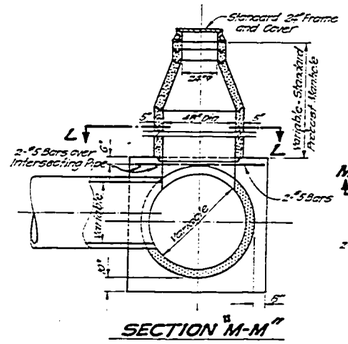
SECTION "J-J"

SPECIAL MANHOLE TYPE "E"

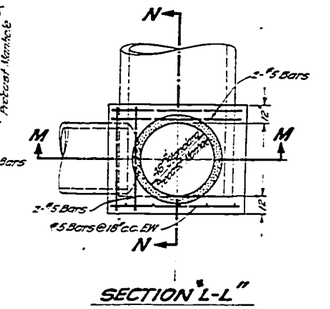
NO SCALE



SECTION "N-N"



SECTION "M-M"



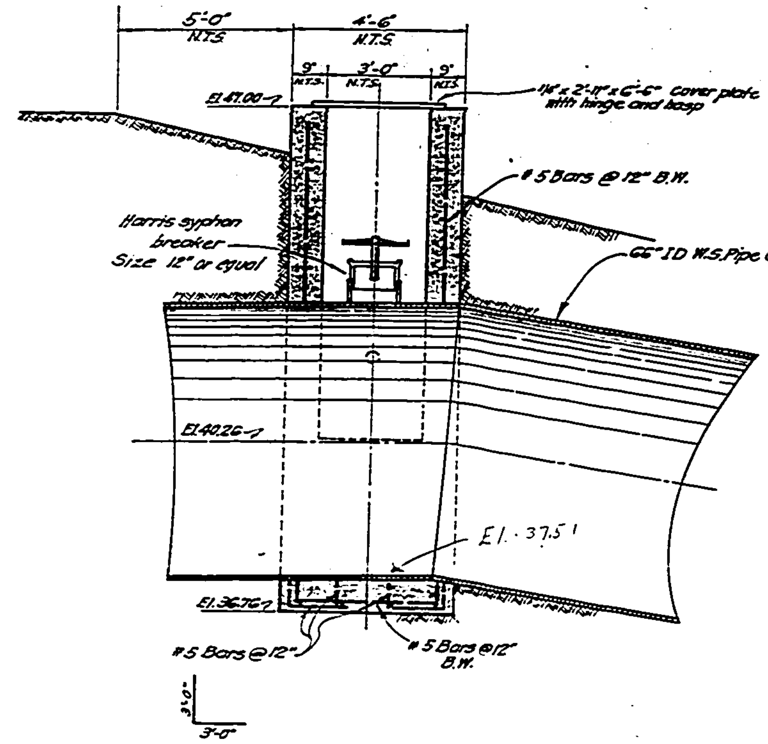
SECTION "L-L"

SPECIAL MANHOLE TYPE "F"

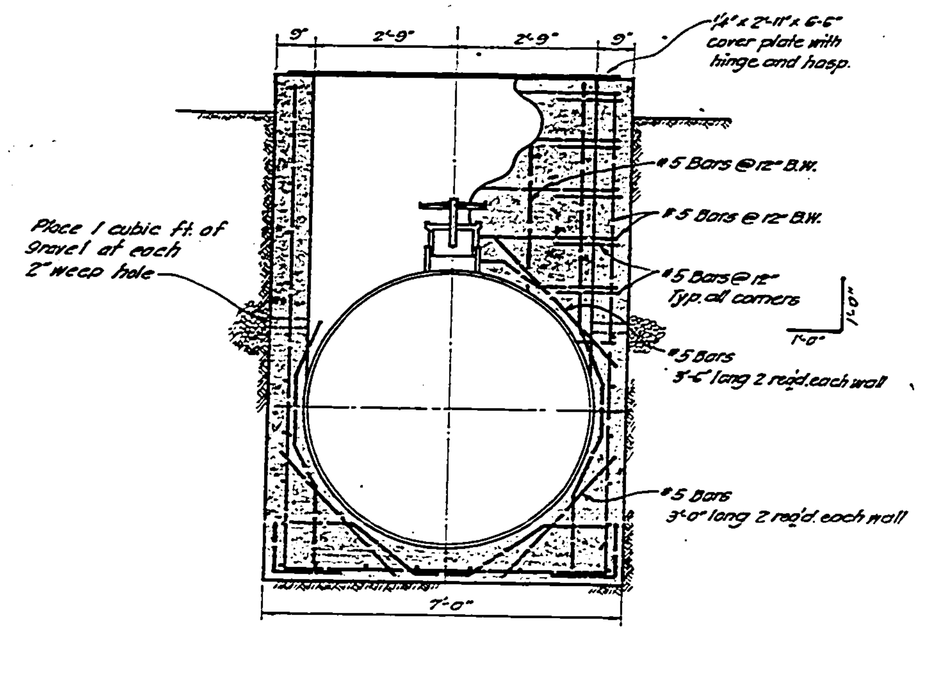
NO SCALE

/dump/wscaaw/p23-1-1963-1/53.tif

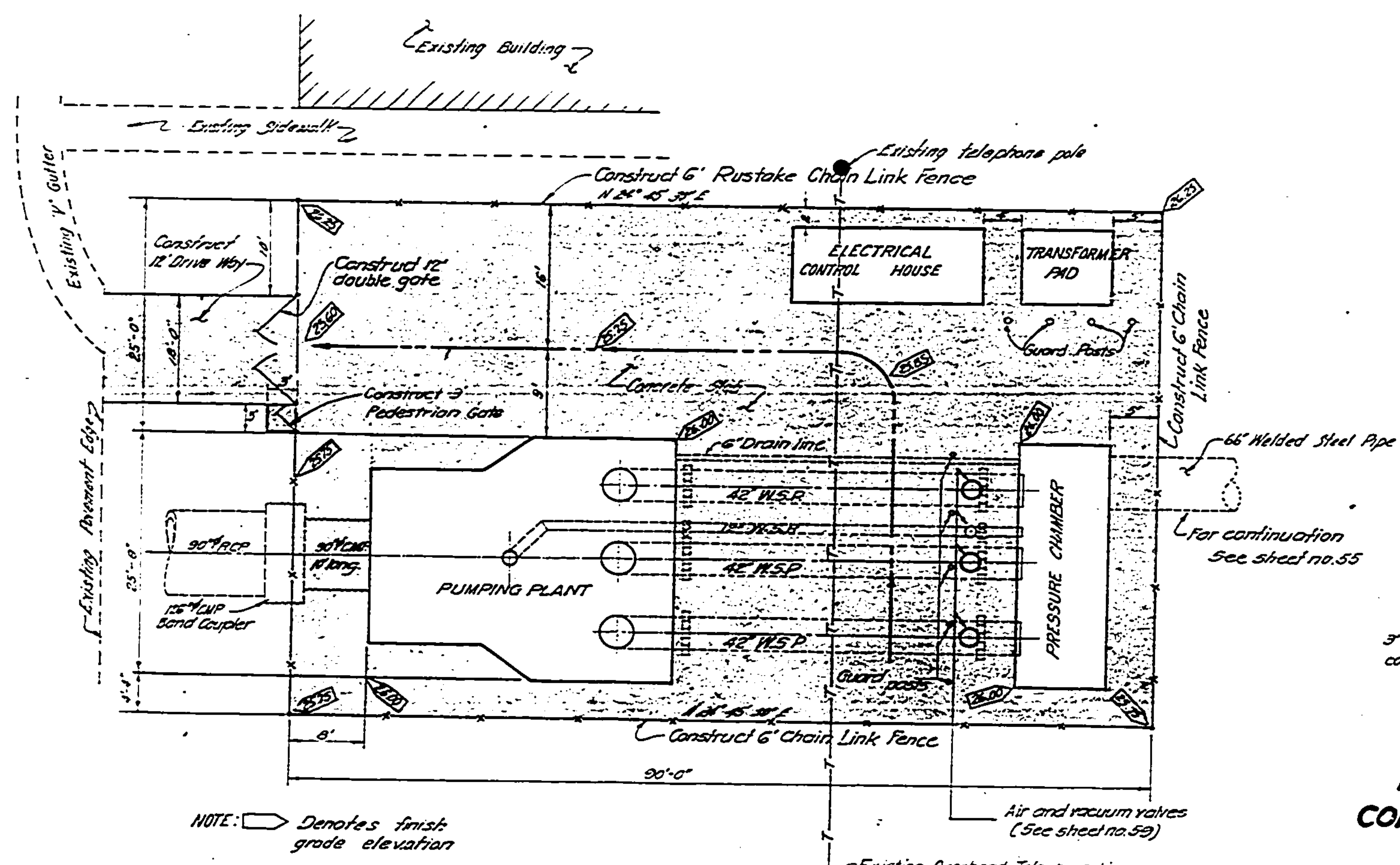
DESIGNED BY A.M.K. DRAWN BY D.L. & D.M. CHECKED BY R.E.I.	REVISION DATE DESCRIPTION BY APPD.	BENCH MARK ELEVATION DATUM DESCRIPTION.	CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. F.B. NO. F.B. NO.	SCALE: HORIZONTAL 1" = 50' VERTICAL 1" = 5' FILE NO.	SPECIAL MANHOLE DETAILS	SPINK ENGINEERING COMPANY ENGINEERS PLANNERS SURVEYORS	SHEET 53 OF 68



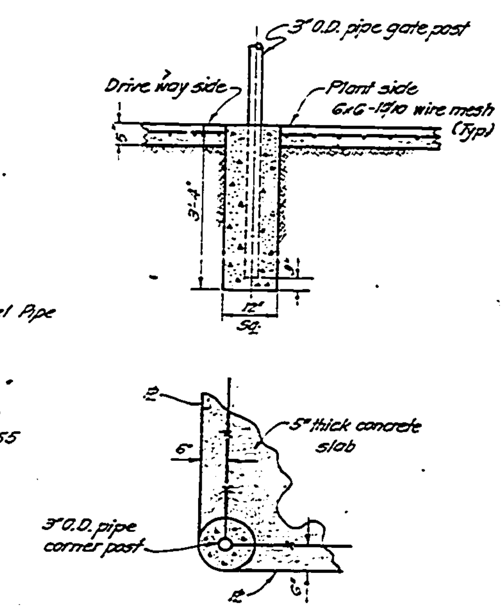
VALVE ENCLOSURE
SECTION THROUGH BOX
Scale: 1/2" = 1'-0"



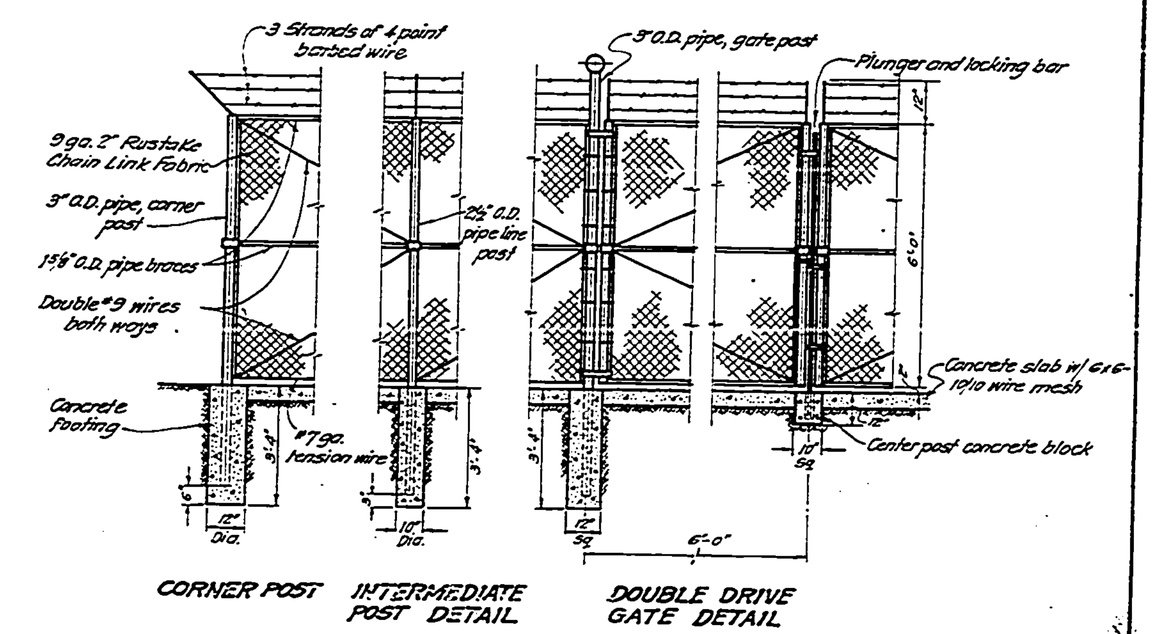
VALVE ENCLOSURE
FRONT AND BACK WALL OF BOX
Scale: 1/2" = 1'-0"



SITE PLAN
Scale: 1" = 10'



FENCE ANCHOR AND CONCRETE SLAB DETAILS
Scale: 1/2" = 1'-0"



CHAIN LINK FENCING DETAILS
No scale

DESIGNED BY	DRAWN BY B.M.	CHECKED BY

REVISION	DATE	DESCRIPTION	BY	APPD

BENCH MARK ELEVATION DATUM
DESCRIPTION:

DRAINAGE PROJECT NO. 14
CITY OF SACRAMENTO, CALIFORNIA

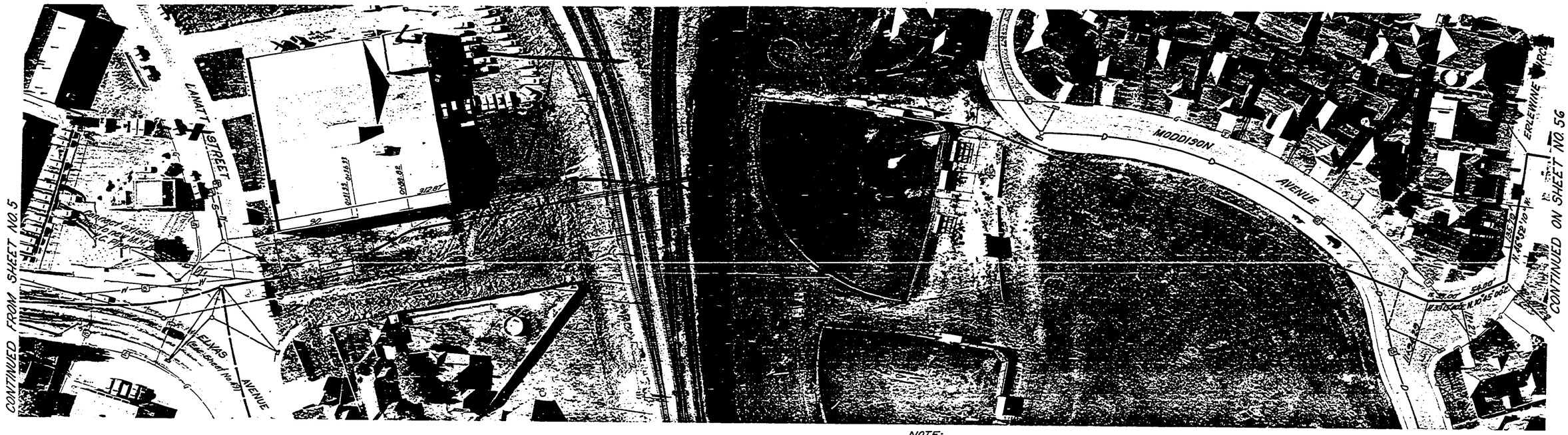
FIELD BOOKS
F.B. NO.
F.B. NO.
F.B. NO.

SCALE:
FILE NO.

PUMPING PLANT SITE PLAN & DETAILS

SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS

SHEET 54 OF 68



NOTE: 1. The Contractor shall give the Southern Pacific Railroad Co. five (5) days written notice prior to commencement of work within the Railroad's right of way.
2. The Contractor may not begin work upon or adjacent to the tracks and property of the railroad until he has entered into an agreement with the railroad satisfactory to and indemnifying the railroad from and against all claims, liability, cost and expense arising out of the performance of the work performed by the Contractor. The Contractor shall furnish at the option of, and without expense to the railroad a certified copy of a policy of Public Liability and Property Damages Insurance, within limits specified by and in a form satisfactory to the railroad, covering the contractual liability assumed by the Contractor in said agreement.

FORCE MAIN

NOTE: The Force Main construction shall not take place during the period of April 1st through July 1st, unless otherwise permitted by the Engineer.

Grout nipple arrangement on intermediate 18' centers

Grout nipple arrangement on 18' centers

Tunnel Liner

TYPICAL GROUT NIPPLE ARRANGEMENT
NO SCALE

40												40
35												35
30												30
25												25
20												20
15												15
10												10
5												5
	0	1	2	3	4	5	6	7	8	9	10	11	12

0+00 ℄ Force Main
0+91.52 ℄ Force Main
0+98.52 ℄ Force Main
0+89.04 ℄
C+ 89.14 ℄
11+94.29 ℄

I:\dump 99\Sacnow\gp23-1-1966-1755.tif

DESIGNED BY A.E.M.
DRAWN BY K.W.H.
CHECKED BY

REVISION	DATE	DESCRIPTION	BY	APPD

BENCH MARK ELEVATION DATUM
DESCRIPTION:

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

FIELD BOOKS
F.B. NO.
F.B. NO.
F.B. NO.

SCALE:
HORIZONTAL 1" = 50'
VERTICAL 1" = 5'

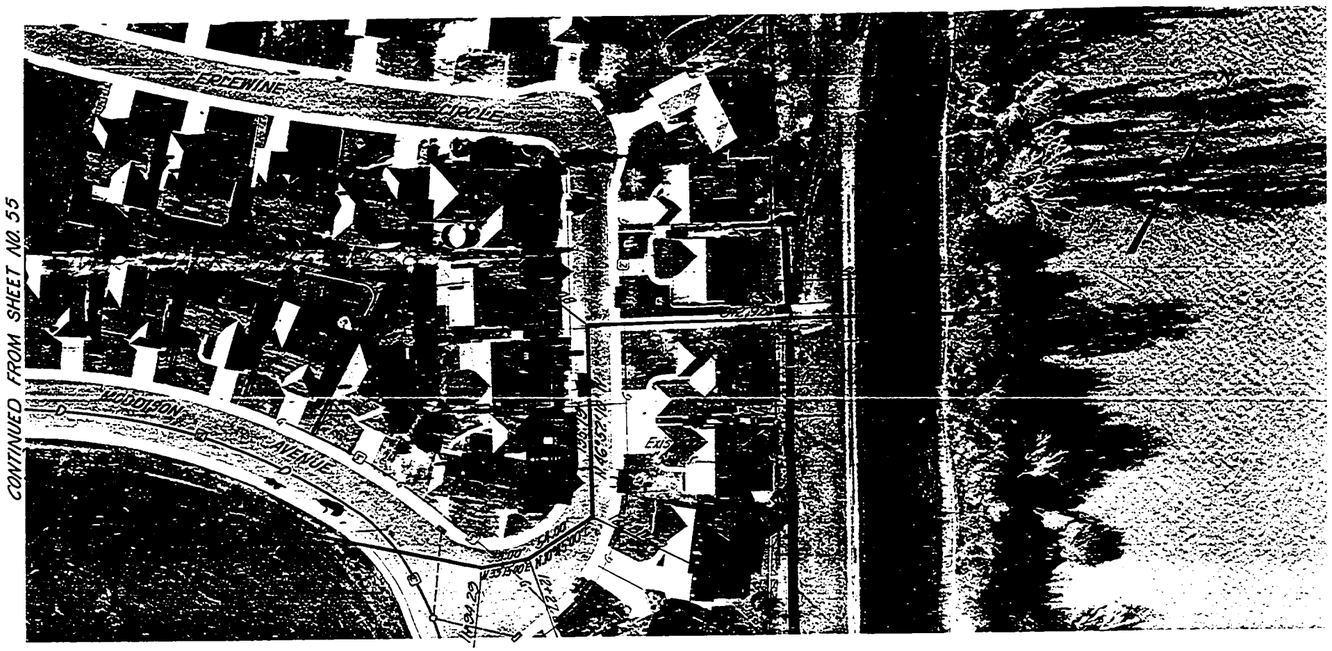
FILE NO.

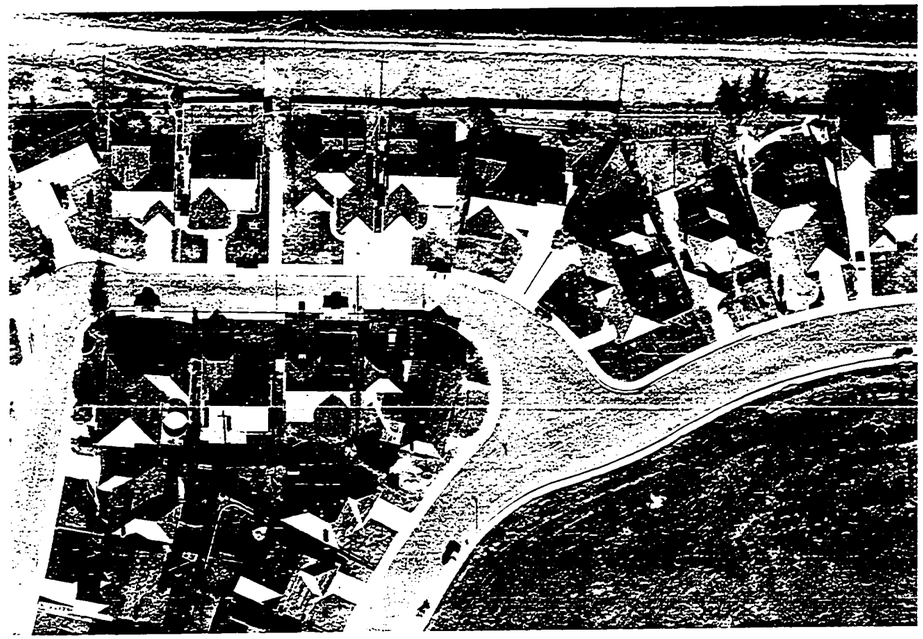
FORCE MAIN
STA. 0+00 TO STA. 11+94.29

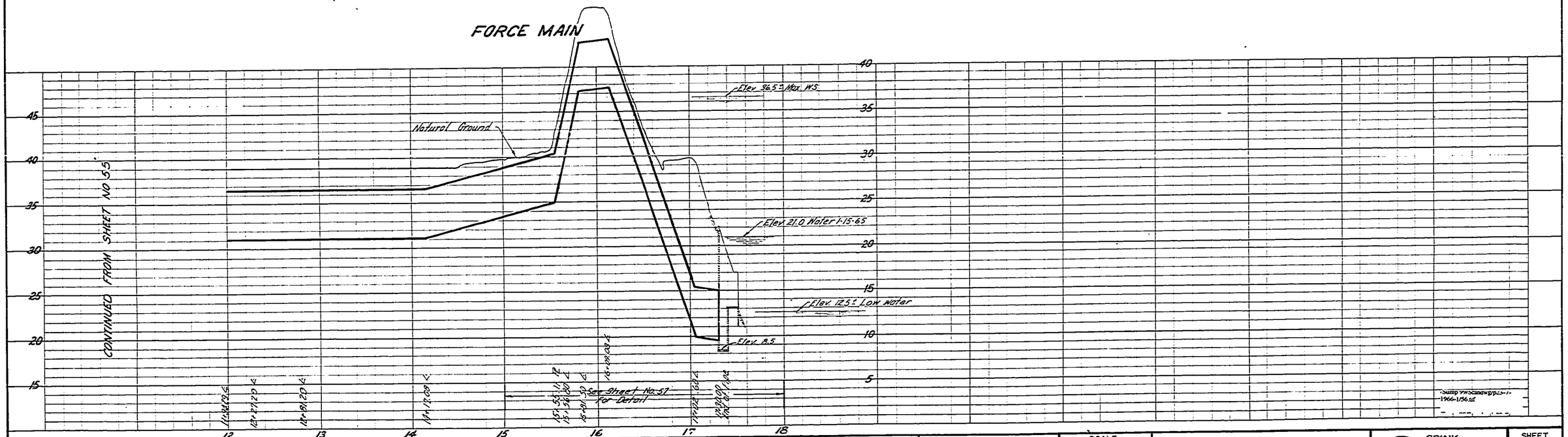
SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS
907 FIFTH STREET SACRAMENTO CALIFORNIA

SHEET 55 OF 68

CONTINUED FROM SHEET NO. 55



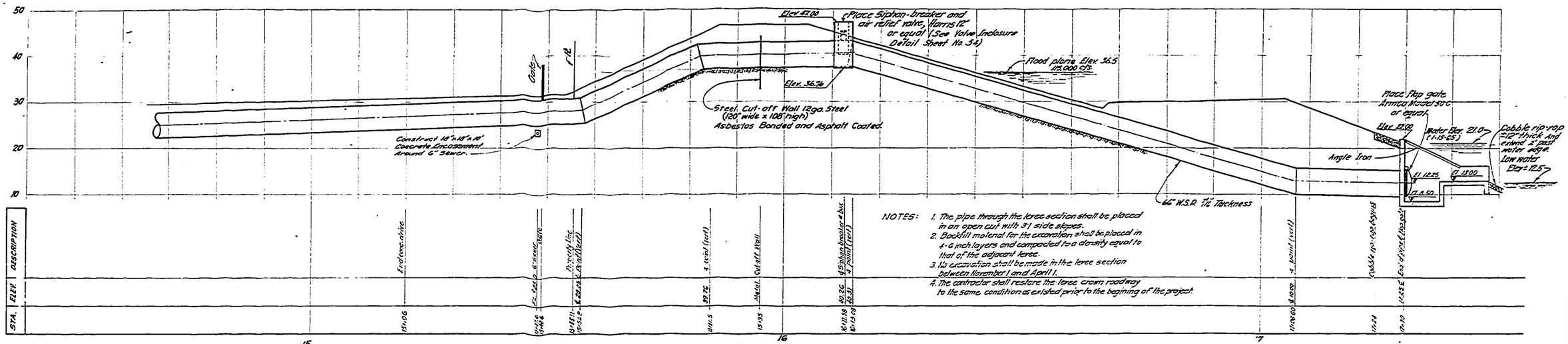




DESIGNED BY A.M.	REVISION	DATE	DESCRIPTION	BY	APPD.	BENCH MARK ELEVATION DATUM	DRAINAGE PROJECT NO. 14
DRAWN BY G.H.						DESCRIPTION:	CITY OF SACRAMENTO, CALIFORNIA
CHECKED BY							

FIELD BOOKS	SCALE:	FORCE MAIN	SPINK ENGINEERING COMPANY	SHEET
F.B. NO.	HORIZONTAL 1" = 50'	STA. 11+94.29 TO STA. 17+30	ENGINEERS PLANNERS SURVEYORS	56 OF 68
F.B. NO.	VERTICAL 1" = 5'			
F.B. NO.	FILE NO.			

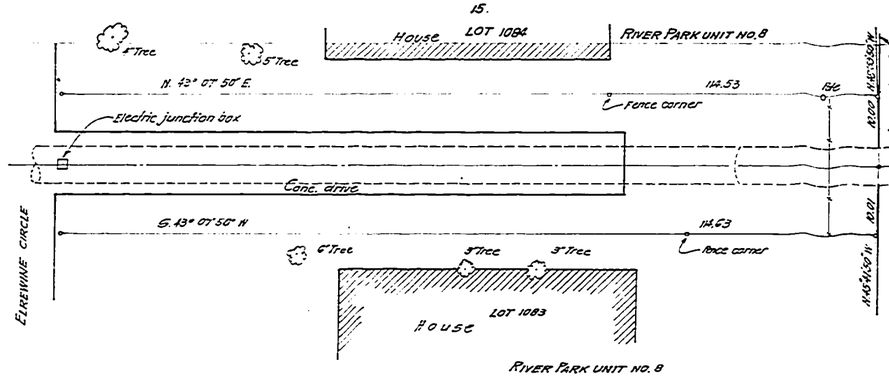
CONTINUED FROM SHEET NO 56

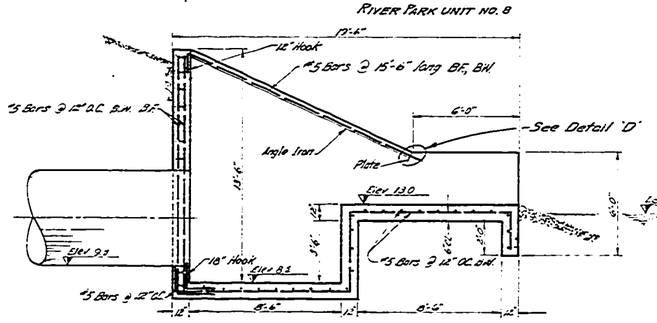


NOTES:
1. The pipe through the levee section shall be placed in an open cut with 3:1 side slopes.
2. Backfill material for the excavation shall be placed in 4-6 inch layers and compacted to a density equal to that of the adjacent levee.
3. No excavation shall be made in the levee section between November 1 and April 1.
4. The contractor shall restore the levee crown roadway to the same condition as existed prior to the beginning of the project.

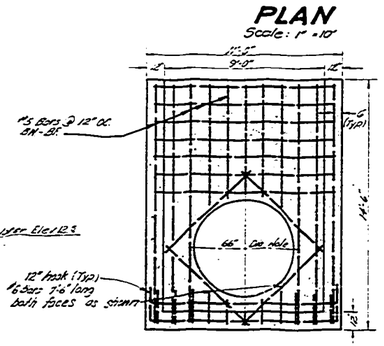
15 16 17

PROFILE
Scale: 1"=10'

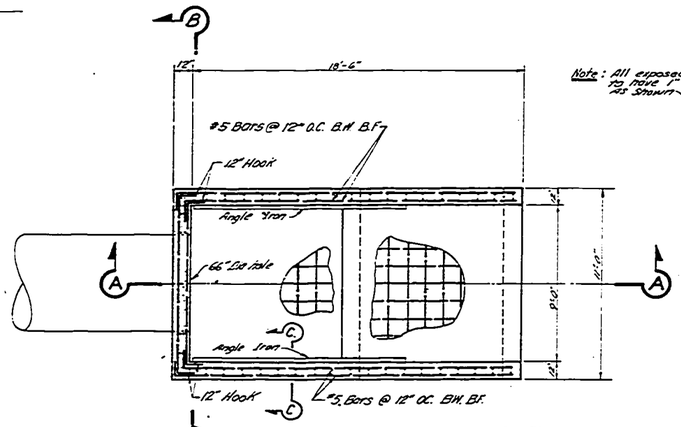




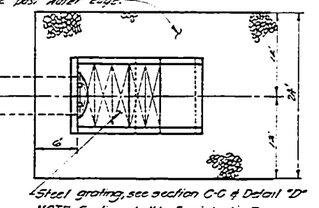
OUTFALL STRUCTURE
SECTION A-A
Scale: 1/4" = 1'-0"



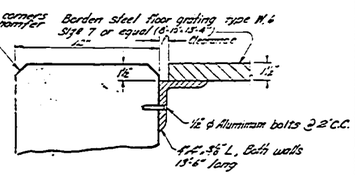
OUTFALL STRUCTURE
SECTION B-B
Scale: 1/4" = 1'-0"



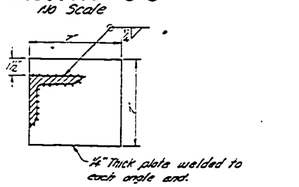
OUTFALL STRUCTURE
PLAN VIEW
Scale: 1/4" = 1'-0"



NOTE: Grating shall be furnished in 5 panels (6'-0"x 32") and shall be fastened to L iron with one fastener per end.



SECTION C-C
NO Scale



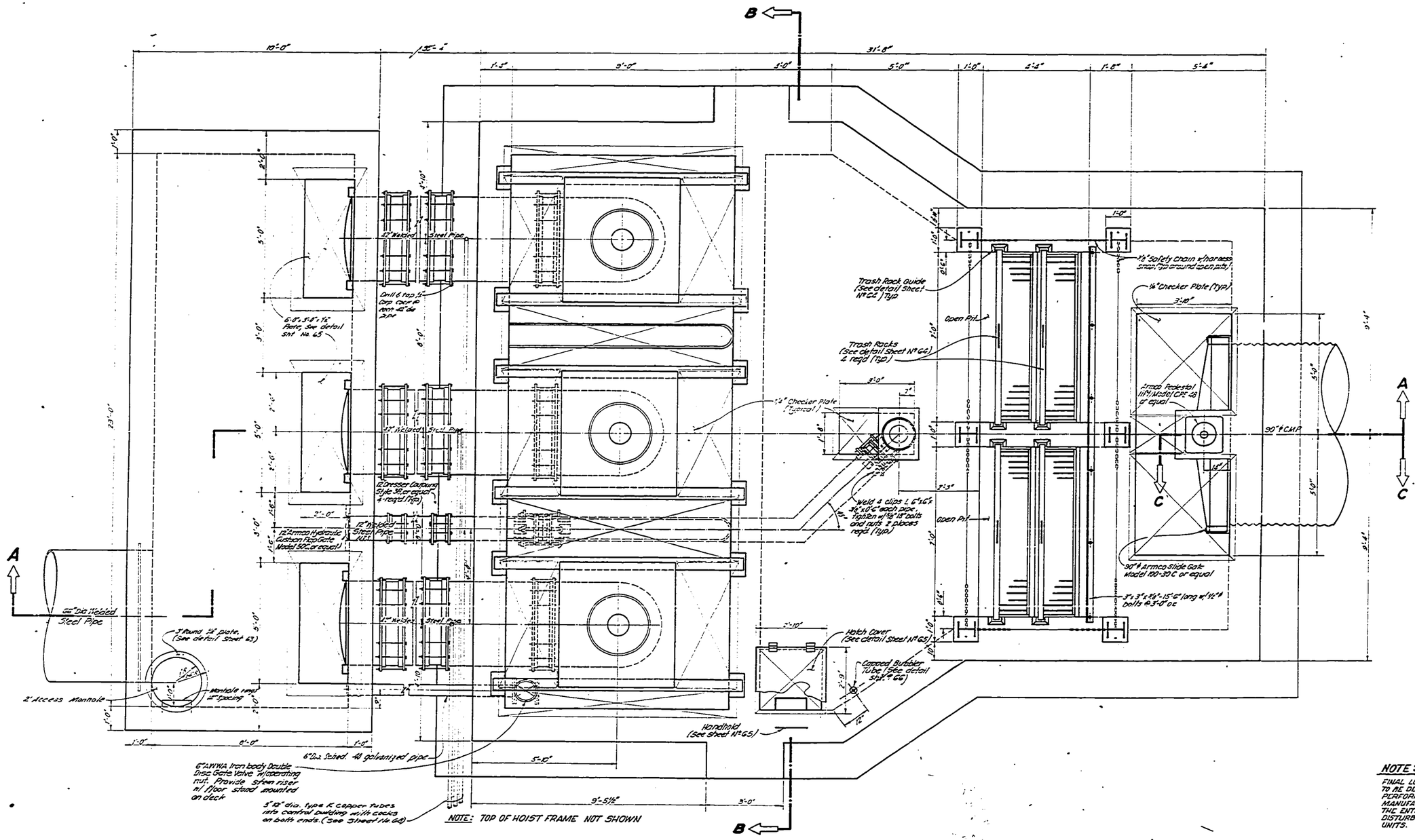
DETAIL 'D'
NO Scale

Stamp www.sacsewerps.2-1-1966-1157.tif

DESIGNED BY ___ DRAWN BY B.M. CHECKED BY ___	REVISION DATE / DESCRIPTION / BY APPD	BENCH MARK ELEVATION ___ DATUM ___ DESCRIPTION	DRAINAGE PROJECT NO. 14 CITY OF SACRAMENTO, CALIFORNIA	FIELD BOOKS F.B. NO. ___ F.B. NO. ___ F.B. NO. ___	SCALE: FILE NO	LEVEE CROSSING & DETAILS

SPINK ENGINEERING COMPANY
ENGINEERS · SURVEYORS

SHEET 57 OF 68



EQUIPMENT PLAN

SCALE: ½" = 1'-0"

Pump ??\Scanned\p23-1-1966-1158.tif

NOTE:

FINAL LOCATION AND DIMENSIONS FOR BEAM SPACINGS TO BE DETERMINED AT TIME PUMP DRAWINGS AND PERFORMANCE CURVES ARE SUBMITTED BY PUMP MFR. MANUFACTURER SHALL SIZE PUMP BASE SUCH THAT THE ENTIRE PUMP UNIT MAY BE REMOVED WITHOUT DISTURBING THE SUPPORT BEAMS OR REMAINING UNITS.

Area in Sump - above Beam + Baffle Walls 558.5 sq ft = 4177 gals per ft or 348 gals per inch
" " " below Top Baffle Walls 540.5 " " = 4043 " " " " 337 " " "
" " " below Top Beam, including baffles 538.25 " " = 4026 " " " " 335.5 " " "

DESIGNED BY TO
DRAWN BY GZ
CHECKED BY REY

REVISION	DATE	DESCRIPTION	BY	APPD.

BENCH MARK ELEVATION DATUM
DESCRIPTION:

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

FIELD BOOKS
F.B. NO.
F.B. NO.
F.B. NO.

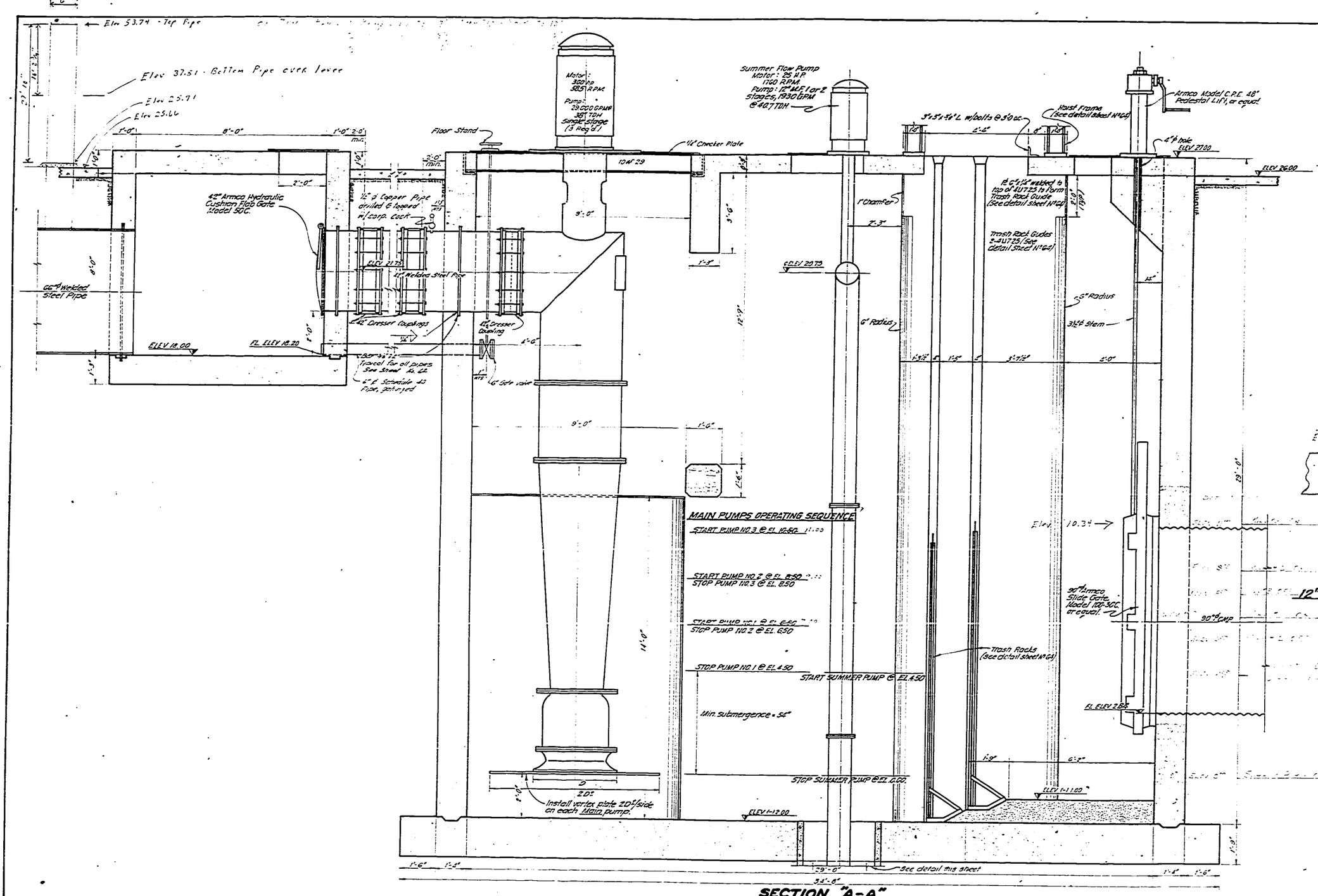
SCALE:

FILE NO.

EQUIPMENT PLAN

SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS
SACRAMENTO CALIFORNIA

SHEET 58 OF 68



SECTION "A-A"
SCALE: 1/2"=1'-0"

/Sump 59/Scandrew/p2.3-1-1966-1/59.tif

DESIGNED BY TD
DRAWN BY GZ
CHECKED BY DEV

REVISION	DATE	DESCRIPTION	BY	APPD

BENCH MARK ELEVATION DATUM
DESCRIPTION:

DRAINAGE PROJECT NO. 14

CITY OF SACRAMENTO, CALIFORNIA

FIELD BOOKS
F.B. NO.
F.B. NO.
F.B. NO.

SCALE:

FILE NO.

EQUIPMENT SECTION

SPINK ENGINEERING COMPANY
ENGINEERS PLANNERS SURVEYORS

SHEET 59 OF 68

APPENDIX C
Off-Site Drainage System At 100-Year 24-Hour Storm Event – Existing Condition Drainage Map

OFF-SITE DRAINAGE SYSTEM AT 100-YEAR 24-HOUR STORM EVENT - EXISTING CONDITION DRAINAGE MAP

MCKINLEY VILLAGE

ENCORE MCKINLEY VILLAGE, LLC

CITY OF SACRAMENTO, CALIFORNIA

SEPTEMBER, 2013

NORTH

0 200 400 800

LEGEND

- PROPERTY BOUNDARY
- 9900 A=14.23 ac — DRAIN SUBSHED
- 498 — CONDUIT
- 99 — DRAIN NODE
- PROPOSED DRAIN LINE
- EXISTING DRAIN LINE
- BASIN 10 INTERCONNECTING DRAIN LINE
- DRAIN SHED – MAJOR
- DRAIN SHED – MINOR
- OVERLAND RELEASE DIRECTION
- 2 — NODE NUMBER
  A= 10.0 Ac. — SHED AREA
  ΣA= 100.0 Ac. — CUMULATIVE AREA
  Q_{100} :100.0 cfs — 100 yr PEAK FLOW
  HGL_{100} :10.0 ft. — 100 yr HGL ELEV

THE VILLAGE PROJECT SITE

CAPITOL CITY FREEWAY (BUSINESS 80)

AMERICAN RIVER

S.P.R.R.

LANATT ST

SUMP No. 99

ELVAS AVE

OVERFLOW FROM BASIN 10

C STREET

30TH STREET

ALHAMBRA BLVD

39TH STREET

36TH WAY

McKINLEY BLVD

52ND STREET

33RD STREET

41ST STREET

D STREET

H STREET

J STREET

McKINLEY PARK

99ex
A= 14.2 Ac.
ΣA= 388.8 Ac.
Q_{100} :148.7 cfs
HGL_{100} :24.33 ft.

399
A= 30.9 Ac.
ΣA= 374.6 Ac.
Q_{100} :154.5 cfs
HGL_{100} :24.32 ft.

300
A= 10.5 Ac.
ΣA= 343.6 Ac.
Q_{100} :136.8 cfs
HGL_{100} :23.94 ft.

9900
A=14.23 ac

360
A= 21.2 Ac.
ΣA= 83.2 Ac.
Q_{100} :59.3 cfs
HGL_{100} :23.77 ft.

3600
A=21.15 ac

365
A= 24.1 Ac.
ΣA= 62.0 Ac.
Q_{100} :57.2 cfs
HGL_{100} :23.77 ft.

3650
A=24.07 ac

370
A= 37.9 Ac.
ΣA= 37.9 Ac.
Q_{100} :28.3 cfs
HGL_{100} :24.32 ft.

3700
A=37.93 ac

340
A= 10.2 Ac.
ΣA= 80.4 Ac.
Q_{100} :40.9 cfs
HGL_{100} :24.17 ft.

3400
A=10.17 ac

3450
A=13.48 ac

350
A= 32.1 Ac.
ΣA= 32.1 Ac.
Q_{100} :18.7 cfs
HGL_{100} :24.65 ft.

345
A= 13.5 Ac.
ΣA= 13.5 Ac.
Q_{100} :7.9 cfs
HGL_{100} :24.35 ft.

3500
A=32.13 ac

355
A= 24.6 Ac.
ΣA= 24.6 Ac.
Q_{100} :32.3 cfs
HGL_{100} :24.19 ft.

3550
A=24.61 ac

3002
A=10.46 ac

335
A= 17.0 Ac.
ΣA= 97.4 Ac.
Q_{100} :61.6 cfs
HGL_{100} :23.95 ft.

3350
A=17.02 ac

3100
A=21.26 ac

310
A= 21.3 Ac.
ΣA= 143.7 Ac.
Q_{100} :76.7 cfs
HGL_{100} :24.20 ft.

3300
A=22.23 ac

330
A= 22.2 Ac.
ΣA= 22.2 Ac.
Q_{100} :22.4 cfs
HGL_{100} :25.55 ft.

3001
A=30.93 ac

305
A= 8.9 Ac.
ΣA= 250.0 Ac.
Q_{100} :115.0 cfs
HGL_{100} :23.93 ft.

3050
A=8.92 ac

308
A= 0.0 Ac.
ΣA= 143.7 Ac.
Q_{100} :78.0 cfs
HGL_{100} :24.06 ft.

315
A= 19.0 Ac.
ΣA= 122.4 Ac.
Q_{100} :71.4 cfs
HGL_{100} :24.19 ft.

3150
A=18.96 ac

1031
A= 0.0 Ac.
ΣA= 0.0 Ac.
Q_{100} :32.8 cfs
HGL_{100} :25.57 ft.

320
A= 13.4 Ac.
ΣA= 103.5 Ac.
Q_{100} :66.3 cfs
HGL_{100} :24.21 ft.

3200
A=13.39 ac

1048
A= 0.0 Ac.
ΣA= 0.0 Ac.
Q_{100} :32.8 cfs
HGL_{100} :25.12 ft.

3201
A=18.51 ac

325
A= 45.6 Ac.
ΣA= 67.8 Ac.
Q_{100} :69.4 cfs
HGL_{100} :24.87 ft.

3250
A=45.61 ac

WOOD RODGERS
ENGINEERING • MAPPING • PLANNING • SURVEYING
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

APPENDIX D
10/100-Year Rainfall Data

APPENDIX D: 10/100-year Rainfall Data

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
0.000	0.000	0.000	0.000	0	0
0.083	0.061	0.083	0.080	1	0.033
0.167	0.061	0.167	0.080	2	0.12
0.250	0.061	0.250	0.080	3	0.294
0.333	0.061	0.333	0.080	4	0.163
0.417	0.061	0.417	0.080	5	0.054
0.500	0.061	0.500	0.080	6	0.033
0.583	0.061	0.583	0.080	7	0.011
0.667	0.061	0.667	0.080	8	0
0.750	0.061	0.750	0.080	9	0
0.833	0.061	0.833	0.080	10	0
0.917	0.061	0.917	0.080	11	0
1.000	0.061	1.000	0.080	12	0
1.083	0.061	1.083	0.080	13	0
1.167	0.061	1.167	0.080	14	0
1.250	0.061	1.250	0.080	15	0
1.333	0.061	1.333	0.080	16	0
1.417	0.061	1.417	0.080	17	0
1.500	0.061	1.500	0.080	18	0
1.583	0.061	1.583	0.080	19	0
1.667	0.061	1.667	0.080	20	0
1.750	0.061	1.750	0.080	21	0
1.833	0.061	1.833	0.080	22	0
1.917	0.061	1.917	0.080	23	0
2.000	0.061	2.000	0.080	24	0
2.083	0.061	2.083	0.080	25	0
2.167	0.061	2.167	0.080	26	0
2.250	0.061	2.250	0.080	27	0
2.333	0.061	2.333	0.080	28	0
2.417	0.061	2.417	0.080	29	0
2.500	0.061	2.500	0.080	30	0
2.583	0.061	2.583	0.080	31	0
2.667	0.061	2.667	0.080	32	0
2.750	0.061	2.750	0.080	33	0
2.833	0.061	2.833	0.080	34	0
2.917	0.061	2.917	0.080	35	0
3.000	0.061	3.000	0.080	36	0
3.083	0.061	3.083	0.080	37	0
3.167	0.061	3.167	0.080	38	0.011
3.250	0.061	3.250	0.080	39	0.022
3.333	0.061	3.333	0.080	40	0.033

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
3.417	0.061	3.417	0.080	41	0.054
3.500	0.061	3.500	0.080	42	0.076
3.583	0.061	3.583	0.080	43	0.098
3.667	0.061	3.667	0.080	44	0.142
3.750	0.061	3.750	0.080	45	0.327
3.833	0.061	3.833	0.080	46	0.207
3.917	0.061	3.917	0.080	47	0.109
4.000	0.061	4.000	0.080	48	0.087
4.083	0.061	4.083	0.080	49	0.065
4.167	0.061	4.167	0.080	50	0.054
4.250	0.061	4.250	0.080	51	0.044
4.333	0.061	4.333	0.080	52	0.033
4.417	0.061	4.417	0.080	53	0.022
4.500	0.061	4.500	0.080	54	0.011
4.583	0.061	4.583	0.080	55	0
4.667	0.061	4.667	0.080	56	0
4.750	0.061	4.750	0.080	57	0
4.833	0.061	4.833	0.080	58	0
4.917	0.061	4.917	0.080	59	0
5.000	0.061	5.000	0.080	60	0
5.083	0.061	5.083	0.080	61	0
5.167	0.061	5.167	0.080	62	0
5.250	0.061	5.250	0.080	63	0
5.333	0.061	5.333	0.080	64	0
5.417	0.061	5.417	0.080	65	0
5.500	0.061	5.500	0.080	66	0
5.583	0.061	5.583	0.080	67	0
5.667	0.061	5.667	0.080	68	0
5.750	0.061	5.750	0.080	69	0
5.833	0.061	5.833	0.080	70	0
5.917	0.061	5.917	0.080	71	0
6.000	0.061	6.000	0.080	72	0
6.083	0.100	6.083	0.130	73	0
6.167	0.100	6.167	0.130	74	0
6.250	0.100	6.250	0.130	75	0
6.333	0.100	6.333	0.130	76	0
6.417	0.100	6.417	0.130	77	0
6.500	0.100	6.500	0.130	78	0
6.583	0.100	6.583	0.130	79	0
6.667	0.100	6.667	0.130	80	0
6.750	0.100	6.750	0.130	81	0
6.833	0.100	6.833	0.130	82	0

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
6.917	0.100	6.917	0.130	83	0
7.000	0.100	7.000	0.130	84	0
7.083	0.100	7.083	0.130	85	0
7.333	0.100	7.333	0.130	88	0
7.417	0.100	7.417	0.130	89	0
7.500	0.100	7.500	0.130	90	0
7.583	0.100	7.583	0.130	91	0
7.667	0.100	7.667	0.130	92	0
7.750	0.100	7.750	0.130	93	0
7.833	0.100	7.833	0.130	94	0.011
7.917	0.100	7.917	0.130	95	0.022
8.000	0.100	8.000	0.130	96	0.033
8.083	0.100	8.083	0.130	97	0.044
8.167	0.100	8.167	0.130	98	0.054
8.250	0.100	8.250	0.130	99	0.065
8.333	0.100	8.333	0.130	100	0.076
8.417	0.100	8.417	0.130	101	0.098
8.500	0.100	8.500	0.130	102	0.163
8.583	0.100	8.583	0.130	103	0.578
8.667	0.100	8.667	0.130	104	0.24
8.750	0.100	8.750	0.130	105	0.109
8.833	0.100	8.833	0.130	106	0.087
8.917	0.100	8.917	0.130	107	0.065
9.000	0.100	9.000	0.130	108	0.054
9.083	0.140	9.083	0.220	109	0.044
9.167	0.140	9.167	0.220	110	0.033
9.250	0.140	9.250	0.220	111	0.033
9.333	0.140	9.333	0.220	112	0.022
9.417	0.140	9.417	0.220	113	0.022
9.500	0.140	9.500	0.220	114	0.011
9.583	0.140	9.583	0.220	115	0.011
9.667	0.140	9.667	0.220	116	0
9.750	0.140	9.750	0.220	117	0
9.833	0.140	9.833	0.220	118	0
9.917	0.140	9.917	0.220	119	0
10.000	0.140	10.000	0.220	120	0
10.083	0.140	10.083	0.220	121	0
10.167	0.140	10.167	0.220	122	0
10.250	0.140	10.250	0.220	123	0
10.333	0.140	10.333	0.220	124	0
10.417	0.140	10.417	0.220	125	0
10.500	0.140	10.500	0.220	126	0

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
10.583	0.190	10.583	0.260	127	0
10.667	0.190	10.667	0.260	128	0
10.750	0.190	10.750	0.260	129	0.011
11.000	0.190	11.000	0.260	132	0.022
11.083	0.270	11.083	0.380	133	0.022
11.167	0.270	11.167	0.380	134	0.033
11.250	0.270	11.250	0.380	135	0.054
11.333	0.270	11.333	0.380	136	0.065
11.417	0.270	11.417	0.380	137	0.076
11.500	0.270	11.500	0.380	138	0.098
11.583	0.400	11.583	0.540	139	0.109
11.667	0.400	11.667	0.540	140	0.12
11.750	0.400	11.750	0.540	141	0.142
11.833	0.560	11.833	0.840	142	0.153
11.917	0.840	11.917	1.320	143	0.174
12.000	3.000	12.000	5.280	144	0.185
12.083	1.320	12.083	2.160	145	0.196
12.167	0.560	12.167	0.840	146	0.207
12.250	0.560	12.250	0.840	147	0.229
12.333	0.400	12.333	0.540	148	0.163
12.417	0.400	12.417	0.540	149	0.131
12.500	0.400	12.500	0.540	150	0.098
12.583	0.270	12.583	0.380	151	0.338
12.667	0.270	12.667	0.380	152	0.425
12.750	0.270	12.750	0.380	153	0.73
12.833	0.270	12.833	0.380	154	0.36
12.917	0.270	12.917	0.380	155	0.054
13.000	0.270	13.000	0.380	156	0.033
13.083	0.190	13.083	0.260	157	0.022
13.167	0.190	13.167	0.260	158	0.011
13.250	0.190	13.250	0.260	159	0.011
13.333	0.190	13.333	0.260	160	0.011
13.417	0.190	13.417	0.260	161	0
13.500	0.190	13.500	0.260	162	0
13.583	0.140	13.583	0.220	163	0
13.667	0.140	13.667	0.220	164	0
13.750	0.140	13.750	0.220	165	0
13.833	0.140	13.833	0.220	166	0
13.917	0.140	13.917	0.220	167	0
14.000	0.140	14.000	0.220	168	0
14.083	0.140	14.083	0.220	169	0
14.167	0.140	14.167	0.220	170	0

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
14.250	0.140	14.250	0.220	171	0
14.333	0.140	14.333	0.220	172	0
14.417	0.140	14.417	0.220	173	0
14.500	0.140	14.500	0.220	174	0
14.750	0.140	14.750	0.220	177	0
14.833	0.140	14.833	0.220	178	0
14.917	0.140	14.917	0.220	179	0
15.000	0.140	15.000	0.220	180	0
15.083	0.100	15.083	0.130	181	0.011
15.167	0.100	15.167	0.130	182	0.022
15.250	0.100	15.250	0.130	183	0.033
15.333	0.100	15.333	0.130	184	0.044
15.417	0.100	15.417	0.130	185	0.054
15.500	0.100	15.500	0.130	186	0.076
15.583	0.100	15.583	0.130	187	0.098
15.667	0.100	15.667	0.130	188	0.142
15.750	0.100	15.750	0.130	189	0.425
15.833	0.100	15.833	0.130	190	0.218
15.917	0.100	15.917	0.130	191	0.109
16.000	0.100	16.000	0.130	192	0.087
16.083	0.100	16.083	0.130	193	0.076
16.167	0.100	16.167	0.130	194	0.065
16.250	0.100	16.250	0.130	195	0.054
16.333	0.100	16.333	0.130	196	0.044
16.417	0.100	16.417	0.130	197	0.033
16.500	0.100	16.500	0.130	198	0.022
16.583	0.100	16.583	0.130	199	0.011
16.667	0.100	16.667	0.130	200	0
16.750	0.100	16.750	0.130	201	0
16.833	0.100	16.833	0.130	202	0
16.917	0.100	16.917	0.130	203	0
17.000	0.100	17.000	0.130	204	0
17.083	0.100	17.083	0.130	205	0
17.167	0.100	17.167	0.130	206	0
17.250	0.100	17.250	0.130	207	0
17.333	0.100	17.333	0.130	208	0
17.417	0.100	17.417	0.130	209	0
17.500	0.100	17.500	0.130	210	0
17.583	0.100	17.583	0.130	211	0
17.667	0.100	17.667	0.130	212	0
17.750	0.100	17.750	0.130	213	0
17.833	0.100	17.833	0.130	214	0

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
17.917	0.100	17.917	0.130	215	0
18.000	0.100	18.000	0.130	216	0
18.083	0.061	18.083	0.080	217	0
18.167	0.061	18.167	0.080	218	0
18.250	0.061	18.250	0.080	219	0
18.500	0.061	18.500	0.080	222	0
18.583	0.061	18.583	0.080	223	0
18.667	0.061	18.667	0.080	224	0
18.750	0.061	18.750	0.080	225	0
18.833	0.061	18.833	0.080	226	0
18.917	0.061	18.917	0.080	227	0
19.000	0.061	19.000	0.080	228	0
19.083	0.061	19.083	0.080	229	0
19.167	0.061	19.167	0.080	230	0.011
19.250	0.061	19.250	0.080	231	0.022
19.333	0.061	19.333	0.080	232	0.054
19.417	0.061	19.417	0.080	233	0.076
19.500	0.061	19.500	0.080	234	0.109
19.583	0.061	19.583	0.080	235	0.316
19.667	0.061	19.667	0.080	236	0.174
19.750	0.061	19.750	0.080	237	0.087
19.833	0.061	19.833	0.080	238	0.065
19.917	0.061	19.917	0.080	239	0.044
20.000	0.061	20.000	0.080	240	0.022
20.083	0.061	20.083	0.080		
20.167	0.061	20.167	0.080		
20.250	0.061	20.250	0.080		
20.333	0.061	20.333	0.080		
20.417	0.061	20.417	0.080		
20.500	0.061	20.500	0.080		
20.583	0.061	20.583	0.080		
20.667	0.061	20.667	0.080		
20.750	0.061	20.750	0.080		
20.833	0.061	20.833	0.080		
20.917	0.061	20.917	0.080		
21.000	0.061	21.000	0.080		
21.083	0.061	21.083	0.080		
21.167	0.061	21.167	0.080		
21.250	0.061	21.250	0.080		
21.333	0.061	21.333	0.080		
21.417	0.061	21.417	0.080		
21.500	0.061	21.500	0.080		

10-yr 24-hr		100-yr 24-hr		100-yr 10-day	
Time (hr)	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**	**Time (hr)**	**Intensity (in/hr)**
21.583	0.061	21.583	0.080		
21.667	0.061	21.667	0.080		
21.750	0.061	21.750	0.080		
21.833	0.061	21.833	0.080		
21.917	0.061	21.917	0.080		
22.000	0.061	22.000	0.080		
22.250	0.061	22.250	0.080		
22.333	0.061	22.333	0.080		
22.417	0.061	22.417	0.080		
22.500	0.061	22.500	0.080		
22.583	0.061	22.583	0.080		
22.667	0.061	22.667	0.080		
22.750	0.061	22.750	0.080		
22.833	0.061	22.833	0.080		
22.917	0.061	22.917	0.080		
23.000	0.061	23.000	0.080		
23.083	0.061	23.083	0.080		
23.167	0.061	23.167	0.080		
23.250	0.061	23.250	0.080		
23.333	0.061	23.333	0.080		
23.417	0.061	23.417	0.080		
23.500	0.061	23.500	0.080		
23.583	0.061	23.583	0.080		
23.667	0.061	23.667	0.080		
23.750	0.061	23.750	0.080		
23.833	0.061	23.833	0.080		
23.917	0.061	23.917	0.080		
24.000	0.061	24.000	0.080		

APPENDIX E
Tentative Subdivision Map

APPENDIX E

TENTATIVE SUBDIVISION MAP

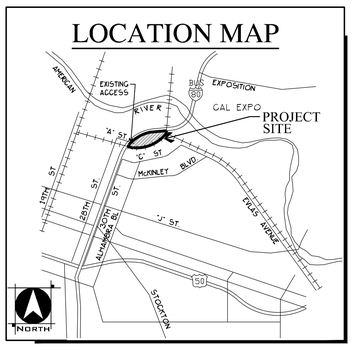
McKINLEY VILLAGE

CITY OF SACRAMENTO, CALIFORNIA

APRIL 26, 2013

(REVISED: MAY 1, 2013)

LOCATION MAP



SUTTER'S LANDING REGIONAL PARK 001-0170-018

SUTTER'S LANDING REGIONAL PARK 001-0170-026

VILLAGE 1
(80) 50'x80'(TYP.) LOTS
8.5± AC.(N)

VILLAGE 2A
(29) 40'x80'(TYP.) LOTS
2.7± AC.(N)

VILLAGE 4
(84) 58'x53' (TYP.) LOTS
7.2± AC.(N)

VILLAGE 2B
(55) 40'x80'(TYP.) LOTS
5.5± AC.(N)

VILLAGE 3
(80) 38'x70'(TYP.) LOTS
6.2± AC.(N)

INTERSTATE 80 FREEWAY (BUSINESS LOOP)

PUBLIC/UTILITIES 001-0170-013

PUBLIC/UTILITIES 003-0061-011

RESIDENTIAL SPECIAL PLANNING DISTRICT

CANNERY OFFICE PARK 004-0010-031

OFFICE 004-0010-025

INDUSTRIAL WAREHOUSE 004-0010-028

LIGHT INDUSTRIAL 004-0010-020

LIGHT INDUSTRIAL 004-0010-021

RAILWAY 001-0170-009

LOT A PARK 0.6± AC. (N)

LOT B PARK 2.2± AC. (N)

LOT C PARK 0.6± AC. (N)

LOT D OPEN SPACE 0.5± AC.(N)

LOT E OPEN SPACE/ DETENTION 0.7± AC. (N)

LOT F OPEN SPACE 0.3± AC. (N)

LOT G OPEN SPACE 1.0± AC. (N)

LOT H OPEN SPACE 0.2± AC. (N)

LOT I OPEN SPACE 0.4± AC. (N)

LOT J OPEN SPACE 0.1± AC. (N)

LOT K OPEN SPACE 0.1± AC. (N)

LOT L OPEN SPACE 0.1± AC. (N)

LOT M OPEN SPACE 0.1± AC. (N)

LOT N OPEN SPACE 0.1± AC. (N)

A STREET (EXISTING)

C STREET (EXISTING)

40th STREET (EXISTING)

LANATT STREET

SUBDIVISION MODIFICATION #1

SUBDIVISION MODIFICATION #2

SUBDIVISION MODIFICATION #3

SUBDIVISION MODIFICATION #4

20' WIDE HOMEOWNERS ASSOCIATION LANDSCAPE MAINTENANCE EASEMENT

8' WIDE HOMEOWNERS ASSOCIATION LANDSCAPE MAINTENANCE EASEMENT

LACK OF ABUTTER'S RIGHTS, RELINQUISHED TO STATE OF CALIFORNIA PER BK. 680804, PG. 136 + BK. 841010, PG. 1142.

20' WIDE UNDERGROUND TELEPHONE FACILITIES EASEMENT IN FAVOR OF PACIFIC TELEPHONE + TELEGRAPH COMPANY, PER 669 O.R. 93. (TO BE ABANDONED)

12' WIDE ELECTRICAL POLE LINE EASEMENT IN FAVOR OF SMUD PER 2226 O.R. 42. (TO BE ABANDONED)

10' WIDE POLE LINE EASEMENT IN FAVOR OF PACIFIC TELEPHONE + TELEGRAPH CO. (VIA SUNSET TELEPHONE COMPANY) PER 3 MISC. DEEDS 431 AND 466 DEEDS 350. EXCEPTION IS MADE FOR TWO POLES TO BE SET UP TO 15' FROM THE RAILROAD RIGHT-OF-WAY. LOCATION OF 2 EXCEPTION POLES NOT KNOWN. (TO BE ABANDONED)

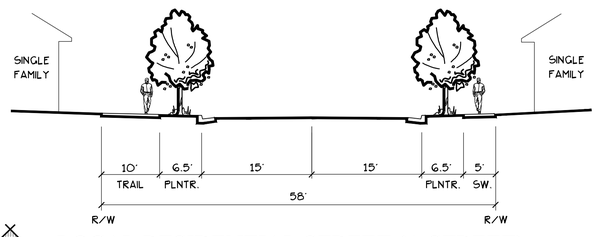
POLE LINE EASEMENT OF UNSPECIFIED WIDTH IN FAVOR OF GREAT WESTERN POWER COMPANY PER 581 DEEDS 266. SAID POLES MAY BE USED FOR ELECTRICAL AND TELEPHONE PURPOSES. THOSE POLES ALONG THE RAILROAD RIGHT-OF-WAY ARE TO BE 5' FROM THE NORTHERLY LINE OF THE RAILROAD WITH THE EXCEPTION OF ONE POLE. (TO BE ABANDONED)

ELECTRICAL POLE LINE EASEMENT IN FAVOR OF PG+E PER 693 DEEDS 487. NO WIDTH OF EASEMENT IS SPECIFIED. ACCEPTED EXISTING POLE LINE AS CENTER LINE OF THE EASEMENT. (TO BE ABANDONED)

GUY AND ANCHOR ESMT. IN FAVOR OF PG+E PER 934 O.R. 198. (TO BE ABANDONED)

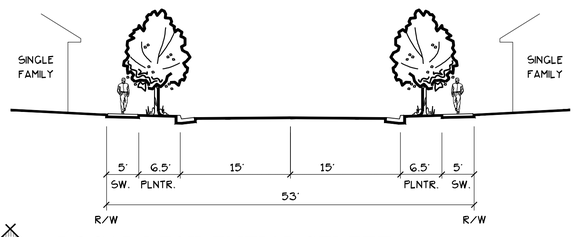
CENTERLINE OF 6' WIDE SANITARY SEWER EASEMENT TOGETHER WITH A 20' WIDE CONSTRUCTION + MAINTENANCE EASEMENT IN FAVOR OF TOWN OF NORTH SACRAMENTO PER 20 O.R. 181 + 43 O.R. 345.

THERE IS NO PHYSICAL EVIDENCE OF THIS EASEMENT ON THE PROPERTY. LOCATION DETERMINED FROM LOCATION OF SANITARY SEWER MANHOLE NEAR THE SOUTH PROPERTY LINE AND ROTATING THE DEED BEARING TO THE BASIS OF THIS SURVEY. THE LOCATION OF THE 20' MAINTENANCE EASEMENT HAS BEEN TAKEN AS 10' ON EACH SIDE OF THE CENTER LINE OF THE SEWER EASEMENT. DEED CONTAINS CONFLICTING CALLS. TO CONFIRM ITS EXISTENCE AND/OR EXACT LOCATION, THE SEWER LINE MUST BE EXPOSED. (TO BE ABANDONED)



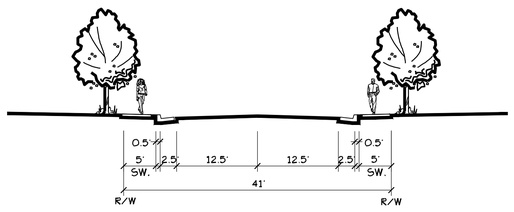
A — LOCAL RESIDENTIAL STREET (A STREET)

58' STREET SECTION
SUBDIVISION MODIFICATION #5
NOT TO SCALE



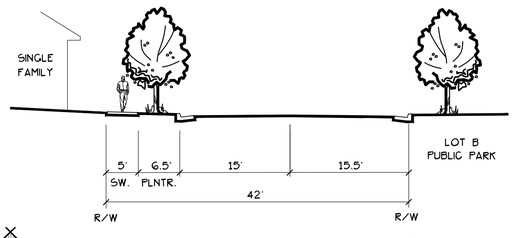
B — LOCAL RESIDENTIAL STREET

53' STREET SECTION
NOT TO SCALE



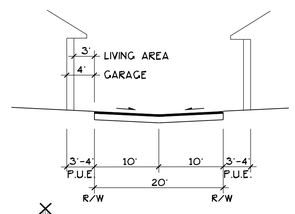
C — LOCAL RESIDENTIAL STREET (A STREET)

41' STREET SECTION (VERTICAL CURB)
SUBDIVISION MODIFICATION #6
NOT TO SCALE



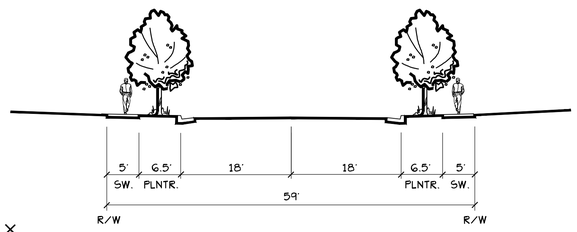
D — LOCAL RESIDENTIAL STREET @ LOT B PARK

42' STREET SECTION
SUBDIVISION MODIFICATION #7
NOT TO SCALE



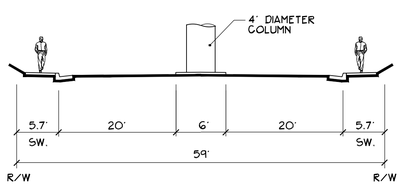
E — ALLEY

20' SECTION
SUBDIVISION MODIFICATION #8
NOT TO SCALE



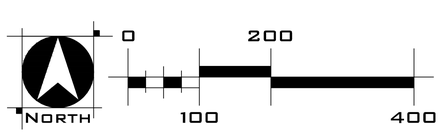
F — LOCAL COMMERCIAL STREET (40th STREET)

59' STREET SECTION
NOT TO SCALE



G — 40th STREET UNDERPASS

59' STREET SECTION
NOT TO SCALE



PROJECT NOTES

OWNER
McKINLEY VILLAGE INVESTORS, LLC
7700 COLLEGE TOWN DRIVE, SUITE 100
SACRAMENTO, CA 95826

APPLICANT
RCI-McKINLEY VILLAGE, LLC
3001 I STREET, SUITE 200
SACRAMENTO, CA 95816
CONTACT: BRET HOGGE
PHONE: (916) 448-1998

PLANNER/ENGINEER
WOOD-RODGERS INC.
3301 'C' STREET, BLDG. 100B
SACRAMENTO, CA 95816
CONTACT: PAUL MEUSER/TIM CRUSH
PHONE: (916) 341-7760

ASSESSOR'S PARCEL NO.
001-0170-028 + 001-0170-013 (PARTIAL)

AREA
48.8± ACRES GROSS

NUMBER OF LOTS
328 SINGLE-FAMILY RESIDENTIAL LOTS
3 PARK LOTS
11 OPEN SPACE LOTS

EXISTING ZONING
M-2

PROPOSED ZONING
R-1A (PUD)

PARK DISTRICT
CITY OF SACRAMENTO

FIRE PROTECTION
CITY OF SACRAMENTO

SEWER
CITY OF SACRAMENTO

STORM DRAIN
CITY OF SACRAMENTO

WATER
CITY OF SACRAMENTO

ELECTRICITY
SMUD

GAS
PG+E

NOTES

1. SUBDIVIDER RESERVES THE RIGHT TO FILE MULTIPLE FINAL MAPS, PURSUANT TO SECTION 66456.1(A)OF THE SUBDIVISION MAP ACT.
2. THIS IS AN APPLICATION FOR A DEVELOPMENT PERMIT.
3. VILLAGE NUMBERING IS FOR IDENTIFICATION PURPOSES ONLY AND DOES NOT INDICATE PHASING ORDER OF DEVELOPMENT. ULTIMATE DEVELOPMENT PHASING SHALL BE ORDERLY AND WILL BE DETERMINED AT FINAL MAP AND/OR IMPROVEMENT PLAN STAGE.
4. PURSUANT TO SECTION 66434(g) OF THE SUBDIVISION MAP ACT, THE FOLLOWING EASEMENTS ARE HEREBY ABANDONED:
   FT+T EASEMENT - 669 O.R. 93
   SMUD EASEMENT - 2226 O.R. 42
   FT+T EASEMENT - 3 MISC DEEDS 431 + 466 DEEDS 350
   GREAT WESTERN POWER CO. EASEMENT - 581 DEEDS 266
   TOWN OF NORTH SACRAMENTO EASEMENT - 20 O.R. 181 + 43 O.R. 345
   PG+E EASEMENT - 693 DEEDS 487
   PG+E EASEMENT - 934 O.R. 198
5. THE AERIAL TOPOGRAPHY SHOWN HEREON WAS FLOWN BY GEOMAPS ON JULY 2006.

LAND USE SUMMARY

LOT NO./ VILLAGE NO.	GENERAL PLAN/ ZONING DESIGNATIONS	USE	ACRES (N)	UNITS	DENSITY
VILLAGE 1	MDR/R-1A (PUD)	S-F RESIDENTIAL	8.5	80	9.4
VILLAGE 2A + B	MDR/R-1A (PUD)	S-F RESIDENTIAL	8.2	84	10.2
VILLAGE 3*	MDR/R-1A (PUD)	S-F RESIDENTIAL	6.2	80	12.9
VILLAGE 4**	MDR/R-1A (PUD)	S-F RESIDENTIAL	7.2	84	11.7
SUBTOTAL			30.1	328	10.9 AVG.
LOT A, B + C	MDR/R-1A (PUD)	PARK	3.4	-	-
LOTS D - N	MDR/R-1A (PUD)	OPEN SPACE	3.6	-	-
SUBTOTAL			7.0	-	-
PUBLIC STREETS			11.7		
TOTAL			48.8	328	

*LOTS 3A-3T ARE INCLUDED IN THE NET ACREAGE FOR VILLAGE 3.
**LOTS 4A-4U ARE INCLUDED IN THE NET ACREAGE FOR VILLAGE 4.

SUBDIVISION MODIFICATIONS

NUMBER	REQUEST
1	NON-STANDARD INTERSECTION
2	NON-STANDARD CENTERLINE RADIUS
3	NON-STANDARD ELBOW
4	DEAD END STREET
5	SECTION A - 58' STREET SECTION. 58' WIDE PUBLIC STREET WITH 15' TRAVEL LANES, 6'-0" PLANTER STRIP, AND SIDEWALK (5' ON THE NORTH, 10' ON THE SOUTH SIDE.)
6	SECTION G - A STREET EXTENSION. 41' WIDE PUBLIC STREET WITH ROLLED CURB AND 5'-0" SIDEWALKS.
7	SECTION D - 42' STREET SECTION. 42' WIDE PUBLIC STREET WITH 15' TRAVEL LANES, AND 6'-0" PLANTER STRIP AND 5'-0" SIDEWALK ON RESIDENTIAL LOT SIDE ONLY.
8	SECTION E - 20' PUBLIC ALLEY. 20' WIDE PUBLIC ALLEY WITH 3' TO 4' WIDE PUBLIC UTILITY EASEMENTS ON BOTH SIDES. THE LIVING AREA OF ALL UNITS WILL BE SET BACK 3' FROM THE ALLEY. GARAGES WILL BE SET BACK 4' MINIMUM.

REGISTERED PROFESSIONAL ENGINEER — TIMOTHY RYAN CRUSH — No. 41978 Exp.03-31-14 — CIVIL — STATE OF CALIFORNIA

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

APPENDIX F
On-Site Drainage System at 10-Year/100-Year 24-Hour Storm Event – Existing Condition

ON-SITE DRAINAGE SYSTEM AT 10-YEAR/100-YEAR 24-HOUR STORM EVENT - EXISTING CONDITION

MCKINLEY VILLAGE

ENCORE MCKINLEY VILLAGE, LLC

CITY OF SACRAMENTO, CALIFORNIA

SEPTEMBER, 2013

MODELING NOTES:

1. NODE HYDRAULIC CALCULATIONS ACCOMMODATE OFF-SITE 100-YR FLOW VOLUME (AS PROVIDED BY THE CITY), IN ADDITION TO LOCAL SHED RUNOFF.
2. JUNCTION STRUCTURE WITH INTERNAL FLAP GATE.

LEGEND

- OVERLAND FLOW DIRECTION
- PROPOSED FORCE MAIN
- (HP) HIGH POINT
- (LP) LOW POINT
- (GP) GRADE BREAK

- S_65 — NODE NAME AS SHOWN IN XPSWMM MODEL
- A(ac)=0.00 — SUB SHED AREA (ACRES)
- ΣA(ac)=1.90 — CUMULATIVE SHED AREA (ACRES)
- Q_{10} (cfs)= 3.2 — PEAK 10-YR FLOW RATE
- Q_{100} (cfs)= 16.9 — PEAK 100-YR FLOW RATE
- HGL_{10}(ft)=9.0 — PEAK 10-YR HGL (WSEL)
- HGL_{100}(ft)=13.2 — PEAK 100-YR HGL (WSEL)
- IMPERV. S=65 — IMPERVIOUS PERCENTAGE OF SUBSHED

SUMMARY TABLE OF MODEL OUTPUT

Upstream Node Name	A(ac)	ΣA(ac)	IMPER. %	Q_{100} (cfs)	Q_{10} (cfs)	Max Water Elevation (ft) (100-yr 24-hr)	Max Water Elevation (ft) (10-yr 24-hr)
DETN	2.40	60.17	2	52.7	36.2	16.72	13.76
MV1	0.00	48.04	N/A	43.4	32.9	16.72	13.77
MV1B	0.53	0.53	65	-0.1	0.1	16.72	13.77
MV2	0.00	47.51	N/A	43.4	33.0	16.73	13.79
MV2A	0.43	0.43	86	1.8	-1.5	16.73	13.79
MV2B	0.26	0.26	95	-1.2	-1.2	16.73	13.79
MV3	0.00	46.82	N/A	41.5	32.4	16.74	14.03
MV38	0.00	12.89	N/A	14.8	10.5	16.74	14.05
MV38A	0.41	0.41	78	1.6	-1.0	16.74	14.05
MV38B	0.60	0.60	79	2.6	1.2	16.74	14.05
MV39	0.00	11.87	N/A	18.1	9.6	16.74	14.11
MV39A	0.32	0.32	80	1.6	-1.1	16.74	14.11
MV39B	0.13	0.13	95	-1.0	-1.0	16.74	14.11
MV40	0.00	11.41	N/A	15.9	9.2	16.74	14.12
MV40B	0.76	0.76	77	3.3	1.5	16.74	14.13
MV41	0.00	7.96	N/A	18.4	8.4	17.02	14.19
MV41A	0.75	0.75	75	3.2	1.3	17.05	14.20
MV41B	0.59	0.59	77	2.8	1.1	17.04	14.20
MV42	0.00	6.63	N/A	14.7	8.5	17.45	14.24
MV42B	0.69	0.69	77	3.3	1.4	17.51	14.29
MV421	0.00	0.32	N/A	1.8	-0.7	17.46	14.25
MV421A	0.16	0.16	83	0.9	0.4	17.46	14.31
MV421B	0.16	0.16	83	0.9	0.4	17.46	14.30
MV43	0.00	5.61	N/A	12.3	7.9	17.66	14.28
MV43A	0.76	0.76	75	3.5	1.5	17.71	14.40
MV43B	0.66	0.66	78	3.2	1.2	17.71	14.35
MV44	0.00	4.20	N/A	9.6	6.1	17.83	14.36
MV441	0.00	1.06	N/A	-9.3	2.1	17.85	14.74
MV441A	0.50	0.50	79	-4.0	1.0	17.85	15.03
MV441B	0.57	0.57	78	4.4	1.1	17.85	15.04
MV44B	0.57	0.57	78	2.5	1.2	17.87	14.59
MV45	0.00	2.57	N/A	5.0	3.4	18.33	14.84
MV45A2	0.14	0.83	95	1.7	1.0	18.33	14.94
MV45A1	0.69	0.69	61	1.4	-0.2	18.34	14.92
MV45B	0.72	0.72	77	3.0	1.5	18.40	14.87
MV46	0.00	1.02	N/A	4.4	1.9	18.83	15.14
MV46B	0.62	0.62	78	2.3	1.2	18.93	15.37
MV47	0.00	0.41	N/A	2.2	0.9	19.07	15.36
MV47A	0.10	0.10	95	-1.1	0.3	19.09	15.64
MV47B	0.31	0.31	81	1.3	0.6	19.09	15.72
MV49	0.00	2.69	N/A	-5.1	2.3	16.75	14.14
MV49B	1.25	1.25	73	-5.5	2.5	16.75	14.15
MV50	0.00	1.45	N/A	-2.0	0.9	16.75	14.15
MV50B	1.45	1.45	75	-1.7	0.8	16.75	14.29
MV31	0.00	8.40	N/A	15.8	9.1	16.74	14.05
MV31A	0.79	0.79	77	3.1	1.5	16.74	14.06
MV31B	0.48	0.48	78	1.9	-1.1	16.74	14.06
MV32	0.00	7.13	N/A	13.3	7.3	16.99	14.30
MV32A	0.22	0.22	82	-1.0	1.0	16.99	14.30
MV32B	0.34	0.34	80	1.4	1.3	16.99	14.30
MV33	0.00	6.56	N/A	11.6	6.7	17.10	14.35
MV33A	0.91	0.91	72	3.5	2.9	17.10	14.35
MV34	0.00	5.65	N/A	8.3	5.9	17.38	14.49
MV34A	1.25	1.25	71	4.0	1.8	17.53	14.51
MV34B	0.85	0.85	75	2.7	1.2	17.44	14.50
MV35	0.00	3.56	N/A	4.7	4.8	17.48	14.58
MV35A	1.31	1.31	72	3.9	1.8	17.58	14.60
MV36	0.00	2.24	N/A	3.6	3.4	17.49	14.58
MV36A	0.91	0.91	77	2.9	1.4	17.51	14.59
MV36B	0.18	0.18	84	0.8	0.5	17.49	14.58
MV37	0.00	1.15	N/A	-5.6	1.9	17.53	14.60
MV37A	0.85	0.85	76	2.8	1.4	17.53	14.72
MV37B	0.19	0.19	83	-4.7	0.4	17.53	14.63
MV37C	0.11	0.11	95	-0.7	0.2	17.53	14.61
MV4	0.00	25.54	N/A	14.0	14.5	16.74	14.14
MV4A	0.28	0.28	84	1.3	1.0	16.74	14.14
MV4B	0.30	0.30	85	1.4	0.7	16.74	14.14
MV5	0.00	24.95	N/A	21.1	13.9	16.71	14.17
MV51	0.00	0.84	N/A	2.4	1.6	16.71	14.19
MV52	0.00	0.84	N/A	2.6	1.6	16.80	14.23
MV52A	0.78	0.78	74	3.4	1.6	16.88	14.24
MV52B	0.06	0.06	95	-0.5	-0.9	16.80	14.23
MVP5A	2.18	2.18	2	1.0	-0.5	16.71	14.17
MV6	0.00	21.92	N/A	19.8	13.2	16.71	14.20
MV7	0.00	21.92	N/A	19.8	13.3	16.78	14.24
MV7A	0.07	0.07	95	-1.0	-0.9	16.78	14.24
MV7B	0.82	0.82	74	3.5	1.5	16.79	14.25
MV8	0.00	21.03	N/A	18.9	12.6	16.97	14.32
MV81	0.00	1.36	N/A	3.9	2.3	16.97	14.42
MV81A	1.03	1.03	76	3.4	1.7	16.99	14.86
MV81B	0.32	0.32	80	1.4	0.6	16.97	14.72
MV8A	0.10	0.10	95	-1.1	-1.2	16.97	14.32
MV9	0.00	19.57	N/A	17.4	12.2	17.13	14.37
MV10	0.00	19.57	N/A	17.4	13.0	17.28	14.43
MV11	0.00	19.57	N/A	17.4	13.4	17.47	14.52
MV11A	0.07	0.07	95	1.6	-1.0	17.47	14.52
MV12	0.00	19.50	N/A	17.0	13.3	17.54	14.58
MV12A	0.39	0.39	81	2.6	0.8	17.54	14.72
MV12B	0.41	0.41	82	2.5	0.9	17.54	14.72
MV13	0.00	18.70	N/A	18.1	12.1	17.89	14.88
MV132	0.00	6.80	N/A	12.4	4.8	17.91	14.89
MV132A	0.45	0.45	77	2.6	0.8	17.92	15.75
MV132B	1.12	1.12	77	4.5	1.7	17.98	15.86
MV133	0.00	5.23	N/A	-12.0	2.9	18.27	15.00
MV133A	0.40	0.40	80	2.1	0.8	18.35	15.01
MV133B	0.34	0.34	80	1.9	0.7	18.34	14.99
MV134	0.00	4.49	N/A	-10.3	1.7	18.41	15.03
MV134A	1.21	1.21	72	4.5	2.1	18.81	15.75
MV135	0.00	3.28	N/A	-9.5	0.6	19.21	15.20
MV135B	3.28	3.28	70	-5.2	0.6	18.53	15.39
MV131	0.00	1.14	N/A	6.3	1.9	17.90	14.90
MV131A	0.91	0.91	78	3.8	1.4	17.94	15.82
MV131B	0.22	0.22	79	2.0	0.5	17.90	15.69
MV14	0.00	10.8	N/A	8.6	5.8	18.61	15.58
MV14A	0.51	0.51	77	2.5	0.9	18.63	15.76
MV141	0.00	0.61	N/A	2.5	1.3	18.71	16.73
MV141A	0.34	0.34	83	1.4	0.7	18.72	17.13
MV141B	0.27	0.27	81	1.4	0.6	18.71	17.12
MV15	0.00	9.64	N/A	6.8	4.2	18.82	15.97
MV151	0.00	4.66	N/A	4.7	2.5	18.92	16.03
MV151A1	0.21	0.74	80	2.3	1.1	18.93	16.58
MV151B1	0.14	1.07	95	2.2	1.1	18.94	16.59
MV151A2	0.53	0.53	42	1.5	0.6	18.95	17.02
MV151B2	0.93	0.93	31	1.7	0.8	18.97	17.05
MV152	0.00	2.85	N/A	1.9	0.7	18.96	16.11
MV1521	0.00	2.46	N/A	-1.2	0.2	19.00	16.23
MV1522	0.00	2.46	N/A	1.1	0.2	19.08	17.32
MV1522A	2.46	2.46	3	1.0	0.2	19.16	18.47
MV153	0.00	0.39	N/A	-1.1	0.6	19.03	16.42
MV153A	0.25	0.25	52	-0.7	0.3	19.03	16.66
MV153B	0.13	0.13	95	-0.7	0.3	19.03	16.64
MVP15A1	0.60	0.60	2	1.0	-0.3	18.84	16.04
MV15A2	0.09	0.69	95	1.4	0.7	18.84	16.04
MV16	0.00	4.28	N/A	2.2	1.7	19.11	16.44
MV16A	0.08	0.08	95	-0.8	0.2	19.11	16.80
MV16B	0.20	0.20	85	1.1	0.4	19.12	16.85
MV17	0.00	4.00	N/A	1.8	1.2	19.16	16.54
MV17A	0.43	4.00	72	1.7	0.8	19.17	17.13
MV18	0.00	3.58	N/A	1.5	0.8	19.17	16.86
MV18B	2.59	2.59	71	1.3	0.8	19.18	17.79
MV19	0.00	0.99	N/A	-1.4	0.0	19.19	17.16
MV20	0.00	0.99	N/A	-1.3	0.0	19.19	17.54
MV21	0.00	0.99	N/A	-0.7	0.0	19.21	18.00
MV21A	0.99	0.99	47	-0.3	0.0	19.21	19.00
MV22	1.94	1.94	75	5.7	2.8	16.69	13.76
MV23	0.64	0.64	2	0.0	0.0	12.80	12.80
DETS	7.15	7.56	4	-3.0	1.2	16.73	13.99
MV60	0.00	0.41	N/A	1.8	0.9	16.73	14.98
MV60A	0.20	0.20	95	-1.0	0.5	16.73	15.20
MV60B	0.21	0.21	95	-1.0	0.5	16.73	15.20

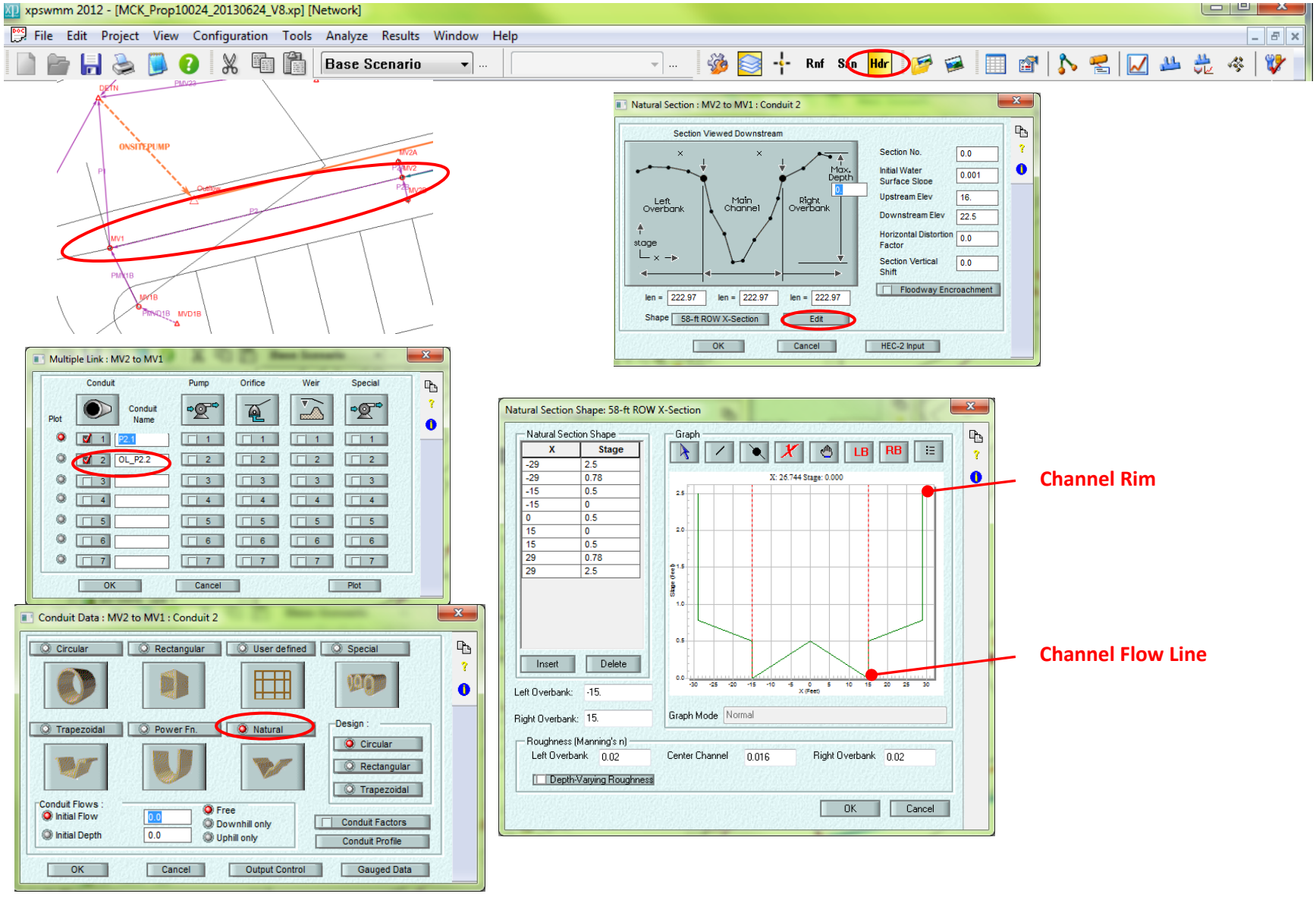
NORTH 0 100 200 400

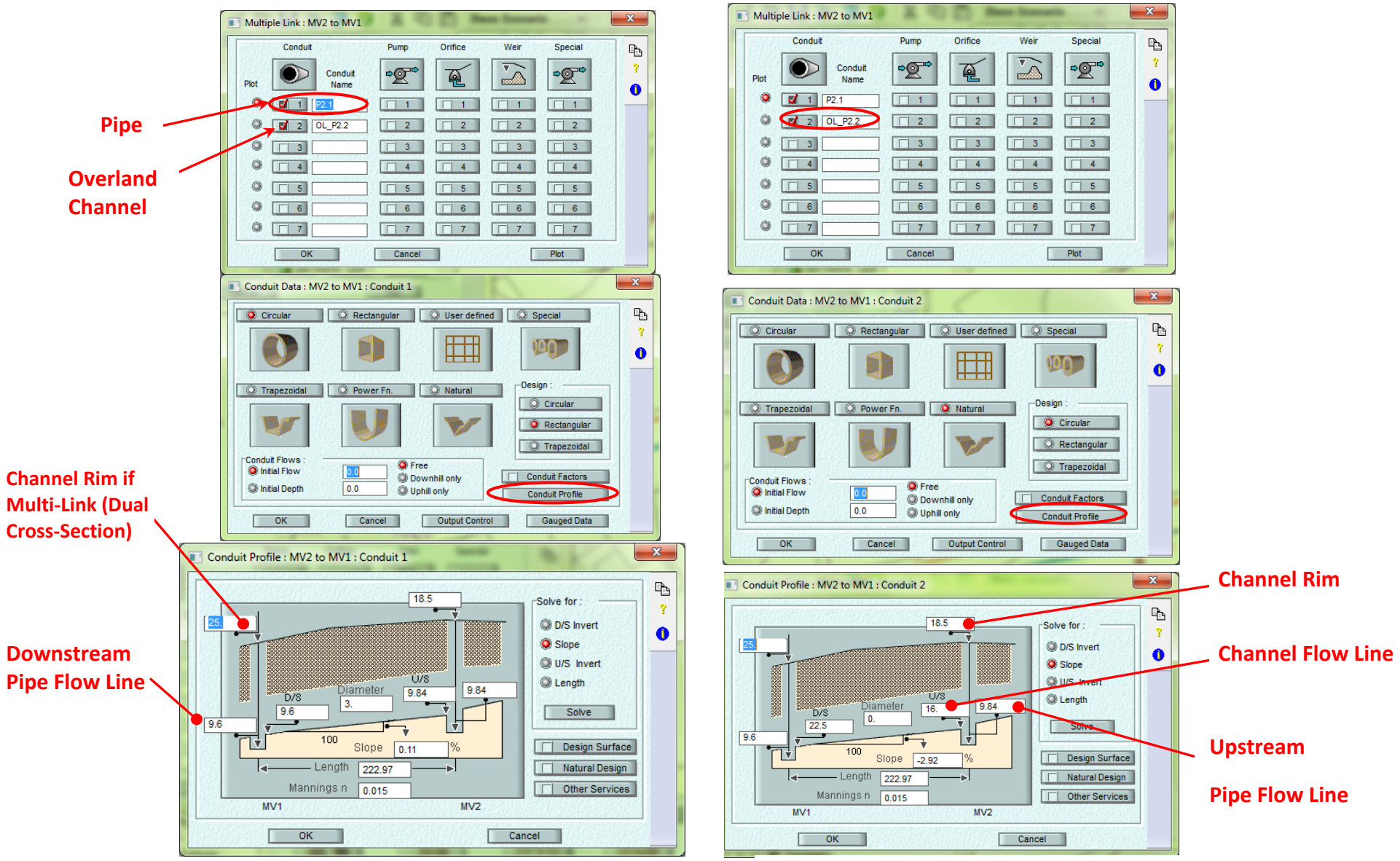
WOOD RODGERS
ENGINEERING • MAPPING • PLANNING • SURVEYING
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

McKinleyVillage\McKinley_Village\Civil\Studies\Drain\Drainage Study Report\DWG\C-STDY-CPV_DrainageStudy.dwg 9/4/2013 2:57 PM Jennifer Buchanan

APPENDIX G
Conduit and Overland Channel Input Parameters and Relationship in XPSWMM

APPENDIX G: Conduit and Overland Channel Input Parameters and Relationship in XPSWMM




Pipe
Overland Channel
Channel Rim if Multi-Link (Dual Cross-Section)
Downstream Pipe Flow Line
Channel Rim
Channel Flow Line
Upstream Pipe Flow Line
Pipe
(Open Channel Roadway)

APPENDIX H
Proposed On-Site Detention Basins – Locations and Sections

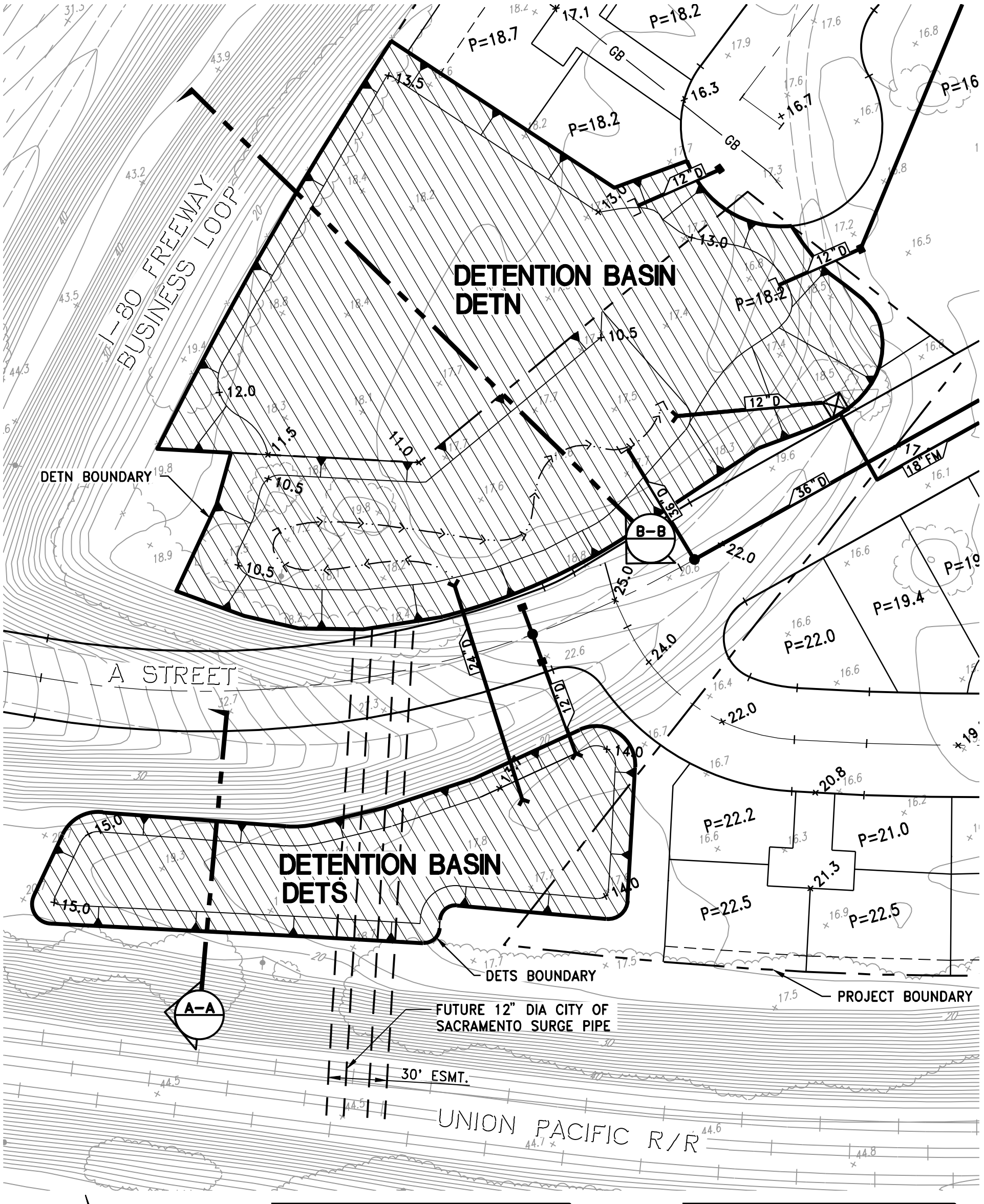
APPEndix H-1
Proposed On-Site Detention Basins

PROPOSED DETENTION BASINS

McKINLEY VILLAGE

SACRAMENTO CALIFORNIA

SEPTEMBER, 2013



50' 25' 0 50'

SCALE: 1" = 50'

LEGEND

- x"D — STORM DRAIN
- PROPOSED PUMP STATION
- x"FM — PROPOSED FORCE MAIN

APPENDIX H-1

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Drain\EXH_DETENTION_BASIN.dwg 9/5/2013 10:58 AM Francisco Lopez

Appendix H-2
Cross-Section of Basin DETN

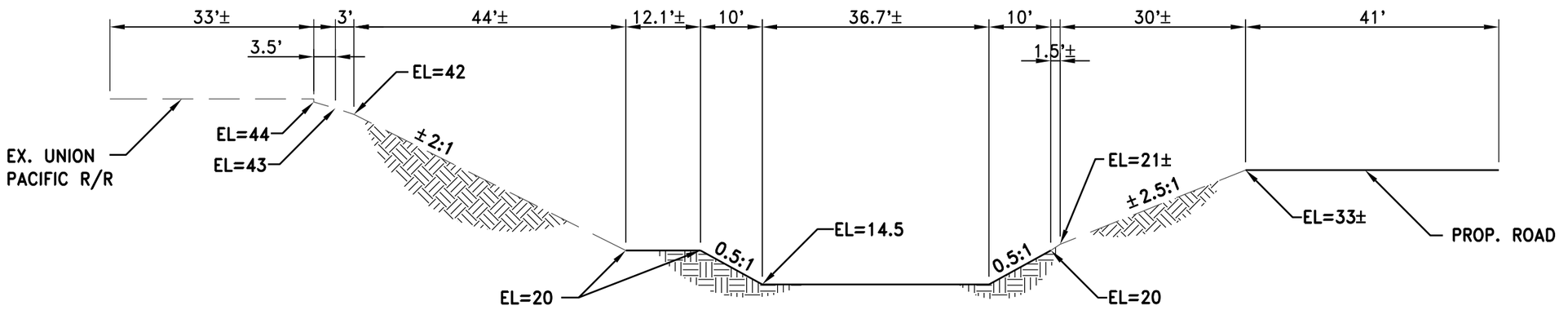
CROSS-SECTION OF BASIN DETN

McKINLEY VILLAGE

SECTION A-A

SACRAMENTO CALIFORNIA

SEPTEMBER, 2013



A-A **DETENTION BASIN SECTION A-A**

NTS

APPENDIX H-2

WOOD RODGERS

DEVELOPING INNOVATIVE DESIGN SOLUTIONS

3301 C St, Bldg. 100-B Tel 916.341.7760

Sacramento, CA 95816 Fax 916.341.7767

J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Drain\EXH_DETENTION_BASIN.dwg 9/5/2013 10:56 AM Francisco Lopez

Appendix H-3
Cross-Section of Basin DETS

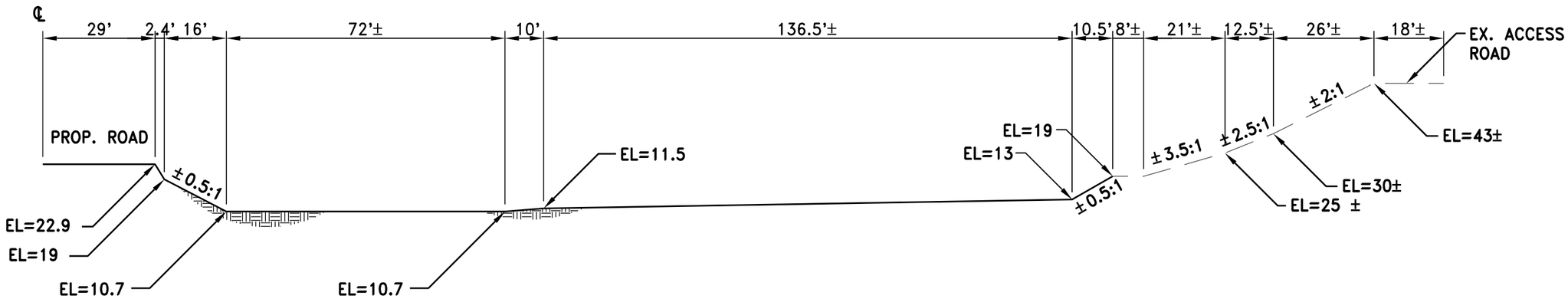
CROSS-SECTION OF BASIN DETS

McKINLEY VILLAGE

SECTION B-B

SACRAMENTO **CALIFORNIA**

SEPTEMBER, 2013



B-B DETENTION BASIN SECTION B-B

NTS

APPENDIX H-3

WOOD RODGERS

DEVELOPING INNOVATIVE DESIGN SOLUTIONS

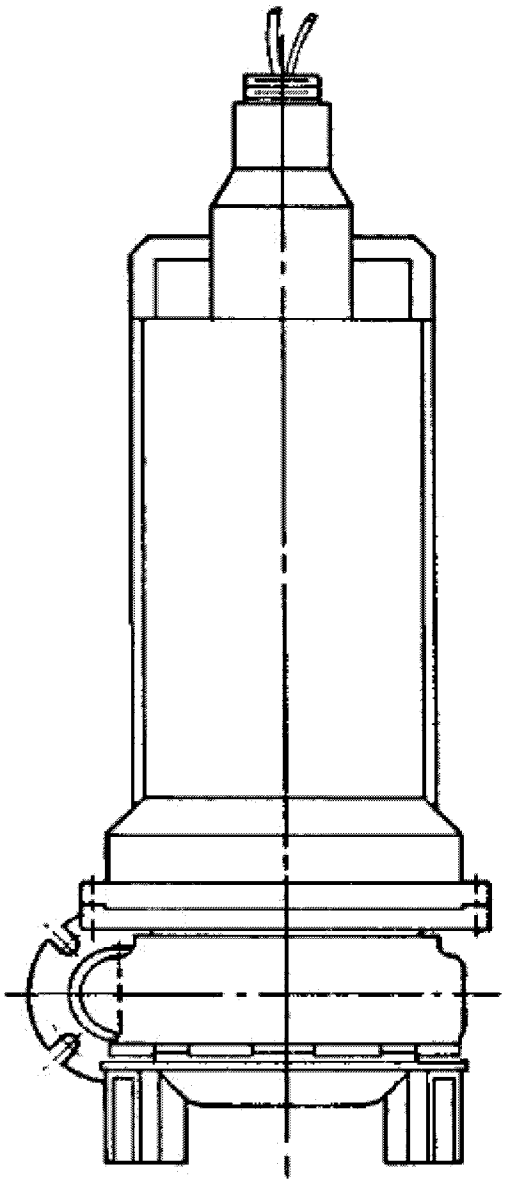
3301 C St, Bldg. 100-B Tel 916.341.7760

Sacramento, CA 95816 Fax 916.341.7767

J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Drain\EXH_DETENTION_BASIN.dwg 9/5/2013 10:56 AM Francisco Lopez

APPENDIX I
Proposed On-Site Pump Description

GOULDS PUMPS



MODEL JCU

with Reliance Motors

ITT

IMPORTANT SAFETY NOTICE

To: Our Valued Customers

User safety is a major focus in the design of our products. Following the precautions outlined in this manual will minimize your risk of injury.

ITT Goulds pumps will provide safe, trouble-free service when properly installed, maintained, and operated.

Safe installation, operation, and maintenance of ITT Goulds Pumps equipment are an essential end user responsibility. This *Pump Safety Manual* identifies specific safety risks that must be considered at all times during product life. Understanding and adhering to these safety warnings is mandatory to ensure personnel, property, and/or the environment will not be harmed. Adherence to these warnings alone, however, is not sufficient — it is anticipated that the end user will also comply with industry and corporate safety standards. Identifying and eliminating unsafe installation, operating and maintenance practices is the responsibility of all individuals involved in the installation, operation, and maintenance of industrial equipment.

Please take the time to review and understand the safe installation, operation, and maintenance guidelines outlined in this Pump Safety Manual and the Instruction, Operation, and Maintenance (IOM) manual. Current manuals are available at www.gouldspumps.com/literature_ioms.html or by contacting your nearest Goulds Pumps sales representative.

These manuals must be read and understood before installation and start-up.

For additional information, contact your nearest Goulds Pumps sales representative or visit our Web site at www.gouldspumps.com.

SAFETY WARNINGS

Specific to pumping equipment, significant risks bear reinforcement above and beyond normal safety precautions.

⚠ WARNING

A pump is a pressure vessel with rotating parts that can be hazardous. Any pressure vessel can explode, rupture, or discharge its contents if sufficiently over pressurized causing death, personal injury, property damage, and/or damage to the environment. All necessary measures must be taken to ensure over pressurization does not occur.

⚠ WARNING

Operation of any pumping system with a blocked suction and discharge must be avoided in all cases. Operation, even for a brief period under these conditions, can cause superheating of enclosed pumpage and result in a violent explosion. All necessary measures must be taken by the end user to ensure this condition is avoided.

⚠ WARNING

The pump may handle hazardous and/or toxic fluids. Care must be taken to identify the contents of the pump and eliminate the possibility of exposure, particularly if hazardous and/or toxic. Potential hazards include, but are not limited to, high temperature, flammable, acidic, caustic, explosive, and other risks.

⚠ WARNING

Pumping equipment Instruction, Operation, and Maintenance manuals clearly identify accepted methods for disassembling pumping units. These methods must be adhered to. Specifically, applying heat to impellers and/or impeller retaining devices to aid in their removal is strictly forbidden. Trapped liquid can rapidly expand and result in a violent explosion and injury.

ITT Goulds Pumps will not accept responsibility for physical injury, damage, or delays caused by a failure to observe the instructions for installation, operation, and maintenance contained in this Pump Safety Manual or the current IOM available at www.gouldspumps.com/literature.

SAFETY

DEFINITIONS

Throughout this manual the words **WARNING, CAUTION, ELECTRICAL, and ATEX** are used to indicate where special operator attention is required.

Observe all Cautions and Warnings highlighted in this Pump Safety Manual and the IOM provided with your equipment.

⚠ **WARNING**
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Example: Pump shall never be operated without coupling guard installed correctly.

⚠ **CAUTION**
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Example: Throttling flow from the suction side may cause cavitation and pump damage.

⚠ **ELECTRICAL HAZARD**
Indicates the possibility of electrical risks if directions are not followed.

Example: Lock out driver power to prevent electric shock, accidental start-up, and physical injury.

When installed in potentially explosive atmospheres, the instructions that follow the Ex symbol must be followed. Personal injury and/or equipment damage may occur if these instructions are not followed. If there is any question regarding these requirements or if the equipment is to be modified, please contact an ITT Goulds Pumps representative before proceeding.

Example: Improper impeller adjustment could cause contact between the rotating and stationary parts, resulting in a spark and heat generation.

GENERAL PRECAUTIONS

⚠ WARNING

A pump is a pressure vessel with rotating parts that can be hazardous. Hazardous fluids may be contained by the pump including high temperature, flammable, acidic, caustic, explosive, and other risks. Operators and maintenance personnel must realize this and follow safety measures. Personal injuries will result if procedures outlined in this manual are not followed. ITT Goulds Pumps will not accept responsibility for physical injury, damage or delays caused by a failure to observe the instructions in this manual and the IOM provided with your equipment.

General Precautions		
WARNING		NEVER APPLY HEAT TO REMOVE IMPELLER. It may explode due to trapped liquid.
WARNING		NEVER use heat to disassemble pump due to risk of explosion from tapped liquid.
WARNING		NEVER operate pump without coupling guard correctly installed.
WARNING		NEVER run pump below recommended minimum flow when dry, or without prime.
WARNING		ALWAYS lock out power to the driver before performing pump maintenance.
WARNING		NEVER operate pump without safety devices installed.
WARNING		NEVER operate pump with discharge valve closed.
WARNING		NEVER operate pump with suction valve closed.
WARNING		DO NOT change service application without approval of an authorized ITT Goulds Pumps representative.
WARNING		**Safety Apparel:** • Insulated work gloves when handling hot bearings or using bearing heater • Heavy work gloves when handling parts with sharp edges, especially impellers • Safety glasses (with side shields) for eye protection • Steel-toed shoes for foot protection when handling parts, heavy tools, etc. • Other personal protective equipment to protect against hazardous/toxic fluids
WARNING		**Receiving:** Assembled pumping units and their components are heavy. Failure to properly lift and support equipment can result in serious physical injury and/or equipment damage. Lift equipment only at specifically identified lifting points or as instructed in the current IOM. Current manuals are available at www.gouldspumps.com/literature_ioms.html or from your local ITT Goulds Pumps sales representative. Note: Lifting devices (eyebolts, slings, spreaders, etc.) must be rated, selected, and used for the entire load being lifted.
WARNING		**Alignment:** Shaft alignment procedures must be followed to prevent catastrophic failure of drive components or unintended contact of rotating parts. Follow coupling manufacturer's coupling installation and operation procedures.

General Precautions		
WARNING		Before beginning any alignment procedure, make sure driver power is locked out. Failure to lock out driver power will result in serious physical injury.
CAUTION		**Piping:** Never draw piping into place by forcing at the flanged connections of the pump. This may impose dangerous strains on the unit and cause misalignment between pump and driver. Pipe strain will adversely effect the operation of the pump resulting in physical injury and damage to the equipment.
WARNING		**Flanged Connections:** Use only fasteners of the proper size and material.
WARNING		Replace all corroded fasteners.
WARNING		Ensure all fasteners are properly tightened and there are no missing fasteners.
WARNING		**Startup and Operation:** When installing in a potentially explosive environment, please ensure that the motor is properly certified.
WARNING		Operating pump in reverse rotation may result in contact of metal parts, heat generation, and breach of containment.
WARNING		Lock out driver power to prevent accidental start-up and physical injury.
WARNING		The impeller clearance setting procedure must be followed. Improperly setting the clearance or not following any of the proper procedures can result in sparks, unexpected heat generation and equipment damage.
WARNING		If using a cartridge mechanical seal, the centering clips must be installed and set screws loosened prior to setting impeller clearance. Failure to do so could result in sparks, heat generation, and mechanical seal damage.
WARNING		The coupling used in an ATEX classified environment must be properly certified and must be constructed from a non-sparking material.
WARNING		Never operate a pump without coupling guard properly installed. Personal injury will occur if pump is run without coupling guard.
WARNING		Make sure to properly lubricate the bearings. Failure to do so may result in excess heat generation, sparks, and / or premature failure.
CAUTION		The mechanical seal used in an ATEX classified environment must be properly certified. Prior to start up, ensure all points of potential leakage of process fluid to the work environment are closed.
CAUTION		Never operate the pump without liquid supplied to mechanical seal. Running a mechanical seal dry, even for a few seconds, can cause seal damage and must be avoided. Physical injury can occur if mechanical seal fails.
WARNING		Never attempt to replace packing until the driver is properly locked out and the coupling spacer is removed.
WARNING		Dynamic seals are not allowed in an ATEX classified environment.
WARNING		DO NOT operate pump below minimum rated flows or with suction and/or discharge valve closed. These conditions may create an explosive hazard due to vaporization of pumpage and can quickly lead to pump failure and physical injury.

General Precautions		
WARNING		Ensure pump is isolated from system and pressure is relieved before disassembling pump, removing plugs, opening vent or drain valves, or disconnecting piping.
WARNING		**Shutdown, Disassembly, and Reassembly:** Pump components can be heavy. Proper methods of lifting must be employed to avoid physical injury and/or equipment damage. Steel toed shoes must be worn at all times.
WARNING		The pump may handle hazardous and/or toxic fluids. Observe proper decontamination procedures. Proper personal protective equipment should be worn. Precautions must be taken to prevent physical injury. Pumpage must be handled and disposed of in conformance with applicable environmental regulations.
WARNING		Operator must be aware of pumpage and safety precautions to prevent physical injury.
WARNING		Lock out driver power to prevent accidental startup and physical injury.
CAUTION		Allow all system and pump components to cool before handling them to prevent physical injury.
CAUTION		If pump is a Model NM3171, NM3196, 3198, 3298, V3298, SP3298, 4150, 4550, or 3107, there may be a risk of static electric discharge from plastic parts that are not properly grounded. If pumped fluid is non-conductive, pump should be drained and flushed with a conductive fluid under conditions that will not allow for a spark to be released to the atmosphere.
WARNING		Never apply heat to remove an impeller. The use of heat may cause an explosion due to trapped fluid, resulting in severe physical injury and property damage.
CAUTION		Wear heavy work gloves when handling impellers as sharp edges may cause physical injury.
CAUTION		Wear insulated gloves when using a bearing heater. Bearings will get hot and can cause physical injury.

ATEX CONSIDERATIONS and INTENDED USE

Special care must be taken in potentially explosive environments to ensure that the equipment is properly maintained. This includes but is not limited to:

1. Monitoring the pump frame and liquid end temperature.
2. Maintaining proper bearing lubrication.
3. Ensuring that the pump is operated in the intended hydraulic range.

The ATEX conformance is only applicable when the pump unit is operated within its intended use. Operating, installing or maintaining the pump unit in any way that is not covered in the Instruction, Operation, and Maintenance manual (IOM) can cause serious personal injury or damage to the equipment. This includes any modification to the equipment or use of parts not provided by ITT Goulds Pumps. If there is any question regarding the intended use of the equipment, please contact an ITT Goulds representative before proceeding. Current IOMs are available at www.gouldspumps.com/literature_ioms.html or from your local ITT Goulds Pumps Sales representative.

All pumping unit (pump, seal, coupling, motor and pump accessories) certified for use in an ATEX classified environment, are identified by an ATEX tag secured to the pump or the baseplate on which it is mounted. A typical tag would look like this:

The CE and the Ex designate the ATEX compliance. The code directly below these symbols reads as follows:

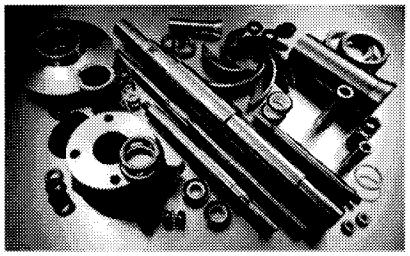
II = Group 2
2 = Category 2
G/D = Gas and Dust present
T4 = Temperature class, can be T1 to T6 (see Table 1)

Table 1

Code	Max permissible surface temperature °F (°C)	Max permissible liquid temperature °F (°C)
T1	842 (450)	700 (372)
T2	572 (300)	530 (277)
T3	392 (200)	350 (177)
T4	275 (135)	235 (113)
T5	212 (100)	Option not available
T6	185 (85)	Option not available

The code classification marked on the equipment must be in accordance with the specified area where the equipment will be installed. If it is not, do not operate the equipment and contact your ITT Goulds Pumps sales representative before proceeding.

PARTS



The use of genuine Goulds parts will provide the safest and most reliable operation of your pump. ITT Goulds Pumps ISO certification and quality control procedures ensure the parts are manufactured to the highest quality and safety levels.

Please contact your local Goulds representative for details on genuine Goulds parts.

I. GENERAL

A. INTRODUCTION

This instruction manual is intended to assist those involved with the installation, operation and maintenance of Goulds SPD slurry pumps. It is recommended that this manual be thoroughly reviewed prior to installing or performing any work on the pump or motor.

B. IMPORTANCE OF INSTRUCTIONS

The design, material and workmanship incorporated in the construction of Goulds SPD slurry pumps makes them capable of giving long, trouble-free service. The life and satisfactory service of any mechanical unit, however, is enhanced and extended by periodic inspection and careful maintenance. This manual was prepared to assist operators in understanding the construction and correct methods of installing, operating, and maintaining these pumps.

Keep this manual handy for reference. Further information can be obtained by contacting the Slurry Pump Division, P.O. Box 419, Baldwinsville, New York, 13027.

C. SPECIAL WARNINGS

Goulds Slurry Pump Division will not be liable for any damages or delay caused by failure to comply with the provisions of this instruction manual. This pump is not to be operated at speeds, working pressures, discharge pressures, or temperatures higher than, nor used with liquids other than, stated in the original order acknowledgement, without written permission of the Slurry Pump Division, Goulds Pumps, Inc.

D. RECEIVING INSPECTION-SHORTAGES

Care should be taken when unloading pumps. If shipment is not delivered in good order and in accordance with the bill of lading, note the damage or shortage on both receipt and freight bill. MAKE ANY CLAIMS TO THE TRANSPORTATION COMPANY PROMPTLY.

E. PRESERVATION AND STORAGE

Goulds Slurry Pump Division's normal domestic shipping and storage preparation is suitable for protecting the pump during shipment in covered trucks. Although this is a submersible pump, storage in a clean, dry area will help preserve the paint and prevent corrosion. Hand rotation of the shaft every thirty days is recommended to keep the seals free and the bearings lubricated.

II. SUMP INSTALLATION

The sump floor should be level and firm where the pump will be placed. Make sure the sump and sump inlet line are free from large pieces of debris which could eventually obstruct the pump inlet.

III. MOTOR INSTALLATION

The motor is furnished with thermal protection and a moisture probe. Wire the motor according to the motor manufacturer's wiring diagram. Re-check the protective circuits after the wiring is completed to avoid a possible motor failure because of an oversight.

The motor has to be completely submerged for continuous operation. It can be operated for a maximum of 15 minutes without being submerged. The sump controls should be set to allow a maximum possible run of 15 minutes after the motor is no longer completely submerged if the sump is large enough to not have completed the pump-down in that time.

The motor is rated for full horsepower with liquid temperatures of 40° C. (104° F.) or lower.

IV. PUMP INSTALLATION

Make sure the lifting device is securely fastened to the motor lugs or hooks so the unit will not be dropped when it is lowered into the sump. Check the 1/8" vent hole in the adapter plate, between the motor and the casing, to make certain it is not plugged and then carefully lower the unit into position in the sump. Check the pump for being approximately level. Support the discharge pipe to prevent excessive loads from being transmitted to the pump flange and casing.

V. STARTING THE PUMP

The most important concern is the prevention of motor overloading. Refer to the motor nameplate for the full load ampere rating of the motor. Install an ammeter on the motor leads and check the motor draw immediately after the unit is started.

An excessive current draw with a 3-phase motor is an indication of wrong rotation. Observe the discharge for flow rate, then change two of the three motor leads to reverse the direction of rotation. If the rotation was wrong, the current draw will be reduced at the same or greater flow rate. Single-phase motors are internally wired for the correct rotation.

The ammeter on the motor leads should be checked for overload at all sump level heights with the liquid that will be normally pumped to check for motor overload at some other condition from that encountered at start-up. The horsepower will tend to increase as the level in the sump rises.

VI. LOCATING TROUBLE

Insufficient or no discharge can be caused by any of the following conditions:

1. Speed too low (usually due to low voltage)
2. System head too high
3. Insufficient NPSH or submergence
4. Wear of the pump parts
5. Wrong direction of rotation
6. Pump not completely primed (plugged vent hole)
7. Suction opening or discharge pipe clogged
8. Viscosity of slurry too high

VII. EXCESSIVE CURRENT DRAW

Excessive current draw can be caused by any of the following conditions:

1. Wrong direction of rotation
2. Pump operating at a high horsepower area of the pump curve (capacity is greater than the design capacity)
3. Impeller rubbing or mechanical defect in the motor
4. Specific gravity or viscosity too high.
5. Low voltage

DISASSEMBLY AND ASSEMBLY

In the sectional assembly in this instruction, it should be noted that the motor mount configuration varies with the motor frame.

A. DISASSEMBLY

1. Disconnect all electrical service. Mark leads for reassembly.
2. Remove cap screws 370E that fasten suction cover to casing. Remove cover and suction cover liner.
3. Remove impeller cap screw 370C. Pull impeller out of casing. If impeller cannot be easily removed, proceed to next step.
4. Remove cap screw 370K which fasten motor-to-motor mount 340. Carefully pull mount with casing attached away from motor.

   If the impeller could not be easily removed in step 3, carefully pry the mount away from the motor. Use two locations on opposite sides simultaneously to prevent possible damage to motor.
5. Remove cap screws 370J or flat head screws 372J and separate motor mount from casing.

   NOTE: THE MOTOR SHALL BE DISASSEMBLED ONLY BY AN AUTHORIZED REPAIR CENTER. FAILURE TO COMPLY WILL RESULT IN VOIDING OF WARRANTY.

   FOR MOTOR INSTRUCTIONS SEE RELIANCE ELECTRIC MAUAL B-3629.

B. ASSEMBLY

Check the vent hole in the adaptor 340 to be sure it is clear.

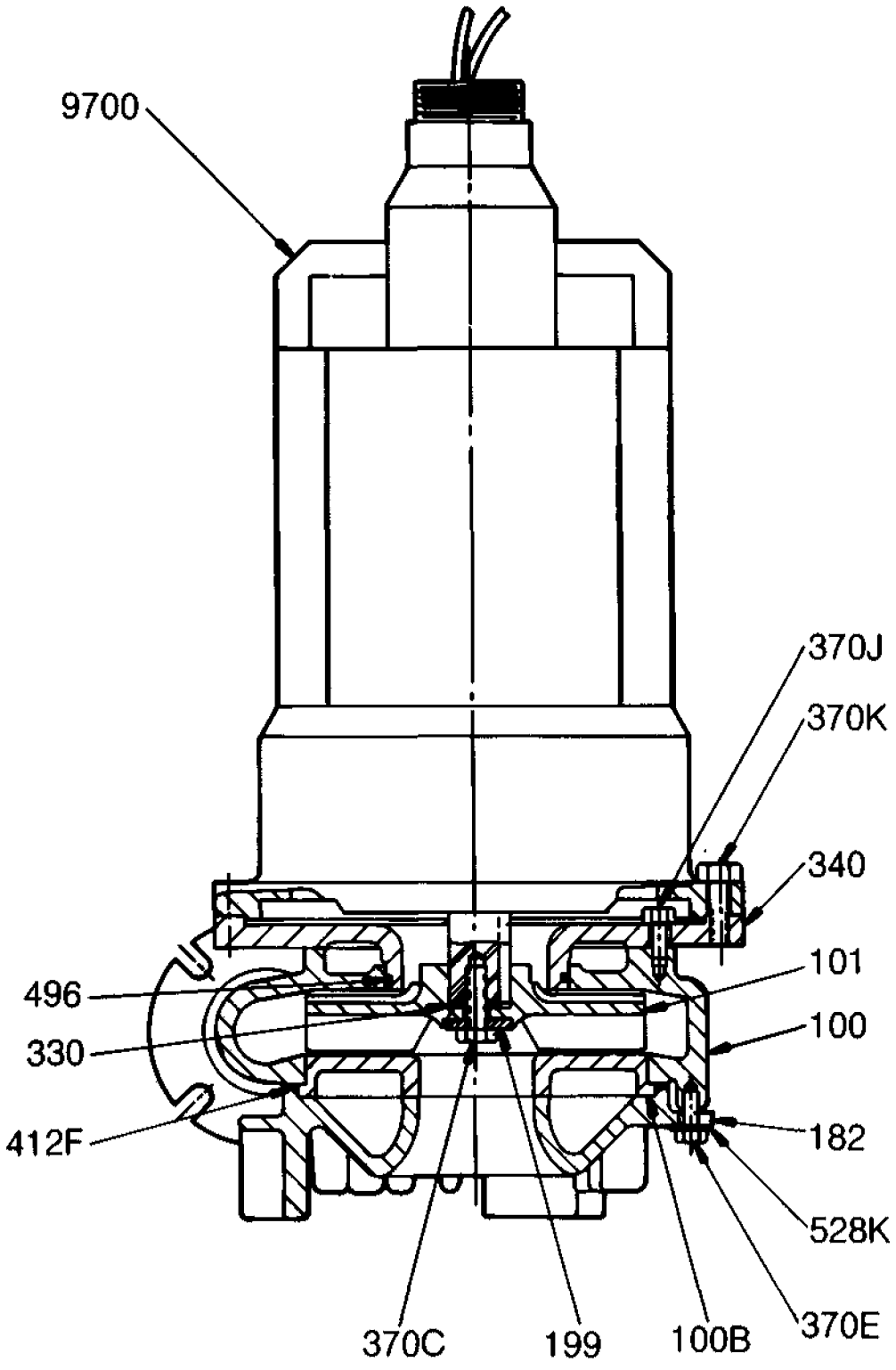
1. Clean and remove any burrs from all mating metal surfaces, including shaft and impeller bore.
2. Install O-Ring 496.
3. Fasten casing and motor mount together.
4. Install mount on motor flange, align and fasten.
5. Push impeller on the shaft until seated. Push suction cover liner into casing and measure clearance between impeller and liner. Feeler gauges can be used with larger pumps by reaching in the suction opening. An alter nate method, recommended for smaller pumps, is to bend a short length (1") of soft solder over each vane edge and tap the liner into position.

   Measure the thickness of the compressed solder strip.

TYPICAL PARTS LIST

ITEM	QTY/ PUMP	PART NAME
100	1	CASING
100B •	1	LINER, SUCTION COVER
101 •	1	IMPELLER
182	1	SUCTION COVER
199	1	(1) WASHER, IMPLELLER
330 •	1 SET	SHIM, IMPELLER
340	1	MOTOR MOUNT
370C	1	(1) HEX CAP SCREW, IMPELLER
370E	VARIES	HEX CAP SCREW
370J	VARIES	(3) HEX CAP SCREW
370K	VARIES	HEX CAP SCREW
412F •	1	O-RING
496 •	1	O-RING
528K	VARIES	WASHER
9700	1	MOTOR

• RECOMMENDED SPARE-PARTS, INCLUDING OUTER MECHANICAL SEAL FOR MOTOR.



NOTES:

(1) FOR 360TY WITH 320TY MOUNTING FLANGE MOTORS ONLY, DELETE IMPELLER WASHER (199) AND IMPELLER SCREW (370C) AND REPLACE WITH IMPELLER NUT (304) OF 316SS FOR ALL PUMP CONSTRUCTIONS.

(2) FLAT HEAD SCREWS (372J) FURNISHED INSTEAD OF HEX CAP SCREW (370J) ON 3" JCU WITH 21OTYZB MOTOR.

(3) THREADED HARDWARE COATED WITH LOCITE 242, OR EQUAL.

6. Make an impeller shim 330 thinner than the measured clearance by the amount given below.

IMPELLER DIAMETER	MEASURED CLEARANCE MINUS SHIM THICKNESS
TO 11"	.010"-.015"
11" TO 14"	.015"-.020"
OVER 14"	.020" - .025"

7. Remove liner and impeller and install shim in impeller bore.
8. Install key and reinstall impeller on motor shaft. Secure with washer 199 and cap screw 370C.
9. Push suction cover liner into casing bore. Check that the lip contacts the casing rather than the face against the impeller.
10. Install O-Ring 412F around liner lip and install suction cover with cap screws 370E and washers 528K. Check for free rotation by turning impeller clockwise by hand with wrench on impeller screw.
11. When connecting electrical service, make sure polarity is correct to give counterclockwise rotation when looking into the suction opening.

IX. SLIDE RAIL SYSTEM — OPTIONAL

A. INSTALLATION

1. With anchor bolts in position, grout elbow base 9542 into place to have its elbow top flange level in both directions.
2. Tighten the anchor bolt nuts after the grout has hardened.
3. Install the discharge pipe.
4. Cut the pipe rail pairs 907 to the required length and install them through the locating holes in the base. Secure the top ends of each pair with the rail bracket 9672, which clamps to the discharge pipe with U-bolts included. If the discharge pipe goes into the sump wall below the top of the pipe rails, an adaptor piece will be required to fit between the rail bracket and the sump wall to hold the pipe rails in place; in this case, remove the U-bolts from the rail bracket assembly.
5. Secure the pump flange to the guide bracket 9671 with gasket 360, studs 356C and nuts 357C. The guide bracket centerline must be parallel with the motor centerline and the nuts tightened to standard torque for the nut size.
6. Attach the lift cable 9679 to the motor and double check the cable clamps.
7. Check the O-ring 496A to be sure it is secure in the guide bracket flange. The O-Ring must be bonded with Loctite adhesive.
8. Lift the pump using the lift cable and lower it to have the guide bracket fit between the rail pipes. The pump should be reasonably level to keep the guide bracket from exerting much force on the rail pipes when the pump is lowered or raised.
9. Carefully lower the pump into position. This operation should be checked once before the sump is filled to be sure the pump properly locks in place. There should not be any visible gap between the 0-ring and the elbow base flange.
10. Refer to the pump section "MOTOR INSTALLATION" and "STARTING THE PUMP" before starting the pump.

B. MAINTENANCE

Whenever the pump is removed from the sump, the 0-Ring should be inspected. If it does not appear to be in good condition, a replacement 0-ring should be installed after the groove has been cleaned and dried so the adhesive will bond to the metal and rubber.

Cleaning the guide bracket around the hinge pin 9868 will help insure proper operation when the pump is lowered back into place.

X. SPARE PARTS

A. ORDERING SPARE PARTS

To insure against possible long and costly down-time periods, especially on critical services, it is advisable to have spare parts on hand.

Parts orders will be handled most promptly if the following directions are followed.

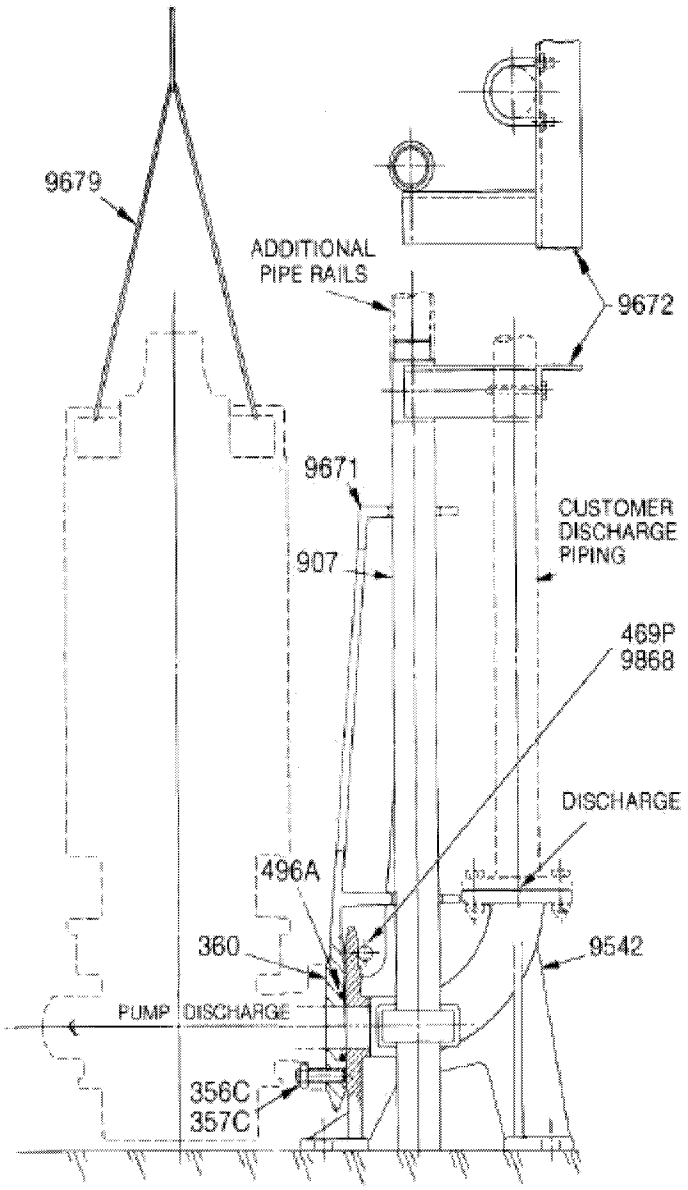
1. Include pump model and size and its serial number as shown on the nameplate.
2. For each part required include the name and part number.
3. State the quantity required of each part.
4. Provide complete shipping instructions.

B. RECOMMENDED SPARES

The following are recommended spare parts:

1 Suction Cover Liner
1 Impeller
1 Shim, Impeller
1 O-Ring Set
1 Outer Mechanical Seal For Motor

Optional
Slide Rail System



(B00397G)

NOTES:

(1) DISCHARGE FLANGE DRILLING CONFORMS TO CLASS 150 ANSI.

(2) RAIL PIPE IS AVAILABLE IN PAIRS OF 6 FOOT LENGTHS AND MUST BE CUT AS NECESSARY BY CUSTOMER TO FIT INSTALLATION. PIPE IS 2" SCHEDULE 40. ALLOW 3" FOR EACH RAIL BRACKET USED.

(3) ONE RAIL BRACKET ASSEMBLY IS REQUIRED WITH EVERY RAIL PIPE PAIR.

(4) REFERENCE THE DRAWING CERTIFIED FOR YOUR ORDER FOR SPECIFIC DETAILS.

Typical PARTS LIST (4)			
ITEM	QTY/ PUMP	NOTE	PART NAME
356C	VARIES		STUD
357C	VARIES		HEX NUT
360	1		GASKET
469P	2		COTTER PIN
496A	1		O RING
907	1		PIPE RAIL, PAIR
9542	1		ELBOW BASE
9671	1		GUIDE BRACKET
9672	1		RAIL BRACKET ASSY
9679	1		LIFT CABLE ASSY
9868	1		HINGE PIN

ITT

Model: JCU	Size: 8X8.5-17.25	Group: S	60Hz	RPM: 870	Stages: 1

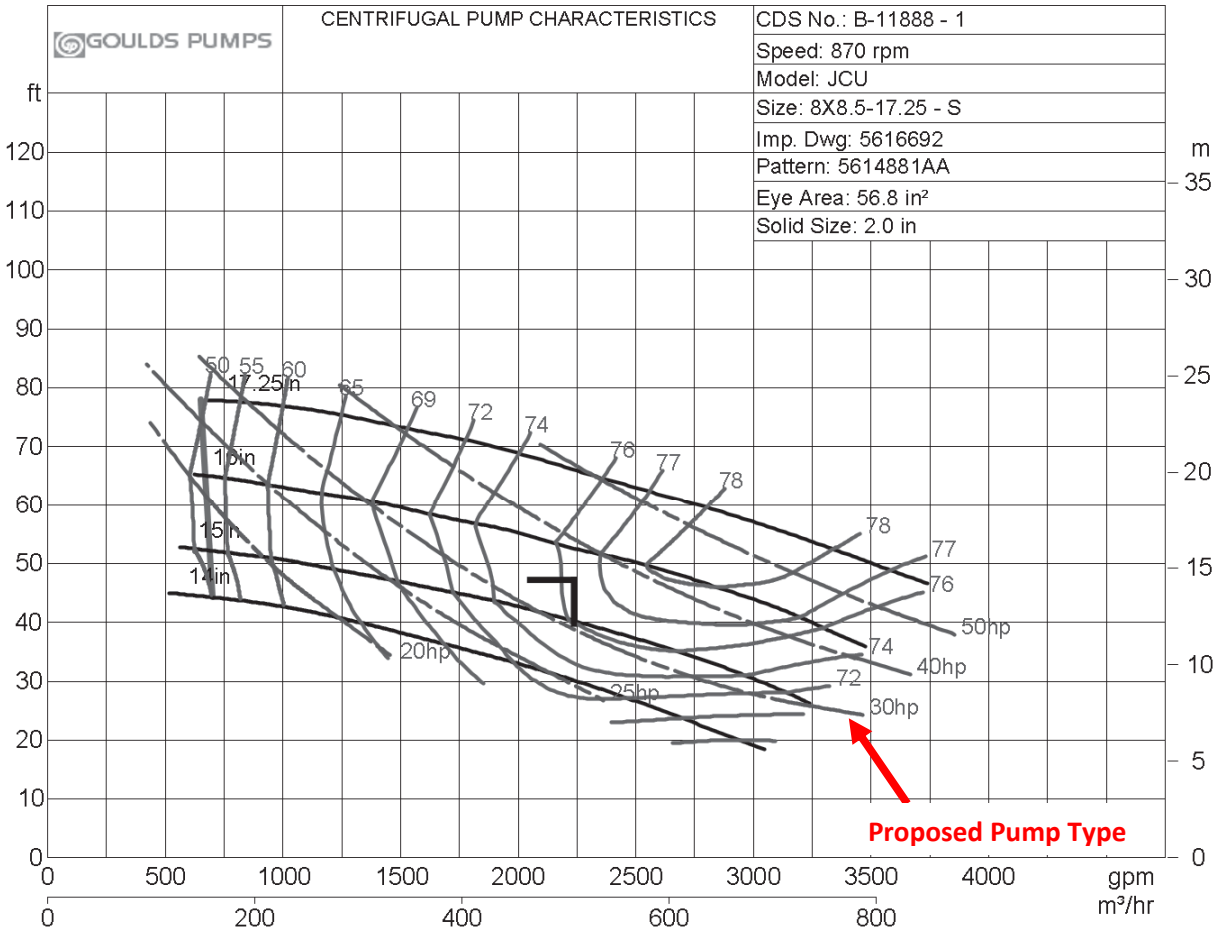
Job/Inq.No. :
Purchaser : UNDEFINED
End User: Issued by :
Item/Equip.No. : ITEM 001 Quotation No. : Date : 07/31/2013
Service :
Order No. : Rev. : 0

Operating Conditions

Liquid:	Water	Published Efficiency:	76.0 %	Suction Specific Speed:	
Temp.:	70.0 deg F	Rated Pump Efficiency:	76.0 %	Min. Hydraulic Flow:	675.0 gpm
S.G./Visc.:	1.000/1.000 cp	Rated Total Power:	35.7 hp	Min. Thermal Flow:	N/A
Flow:	2,250.0 gpm	Non-Overloading Power:	38.1 hp		
TDH:	47.0 ft	Imp. Dia. First 1 Stg(s):	15.6250 in		
NPSHa:	0.0 ft	NPSHr:			
Solid size:		Shut off Head:	63.1 ft		
% Susp. Solids (by wtg):		Vapor Press:		Max. Solids Size:	2.0000 in

Pump Performance

Notes: 1.The Mechanical seal increased drag effect on power and efficiency is not included, unless the correction is shown in the appropriate field above. 2. Magnetic drive eddy current and viscous effect on power and efficiency is not included. 3. Elevated temperature effects on performance are not included. 4. Non Overloading power does not reflect v-belt/gear losses.



ITT

APPENDIX J
Off-Site Drainage System at 100-Year 24-Hour Storm Event – Proposed Condition

Appendix J1
Off-Site Drainage System at 100-Year 24-Hour Storm Event – Proposed Condition Drainage Map

OFF-SITE DRAINAGE SYSTEM AT 100-YEAR 24-HOUR STORM EVENT - PROPOSED CONDITION DRAINAGE MAP

MCKINLEY VILLAGE

ENCORE MCKINLEY VILLAGE, LLC

CITY OF SACRAMENTO, CALIFORNIA

SEPTEMBER, 2013

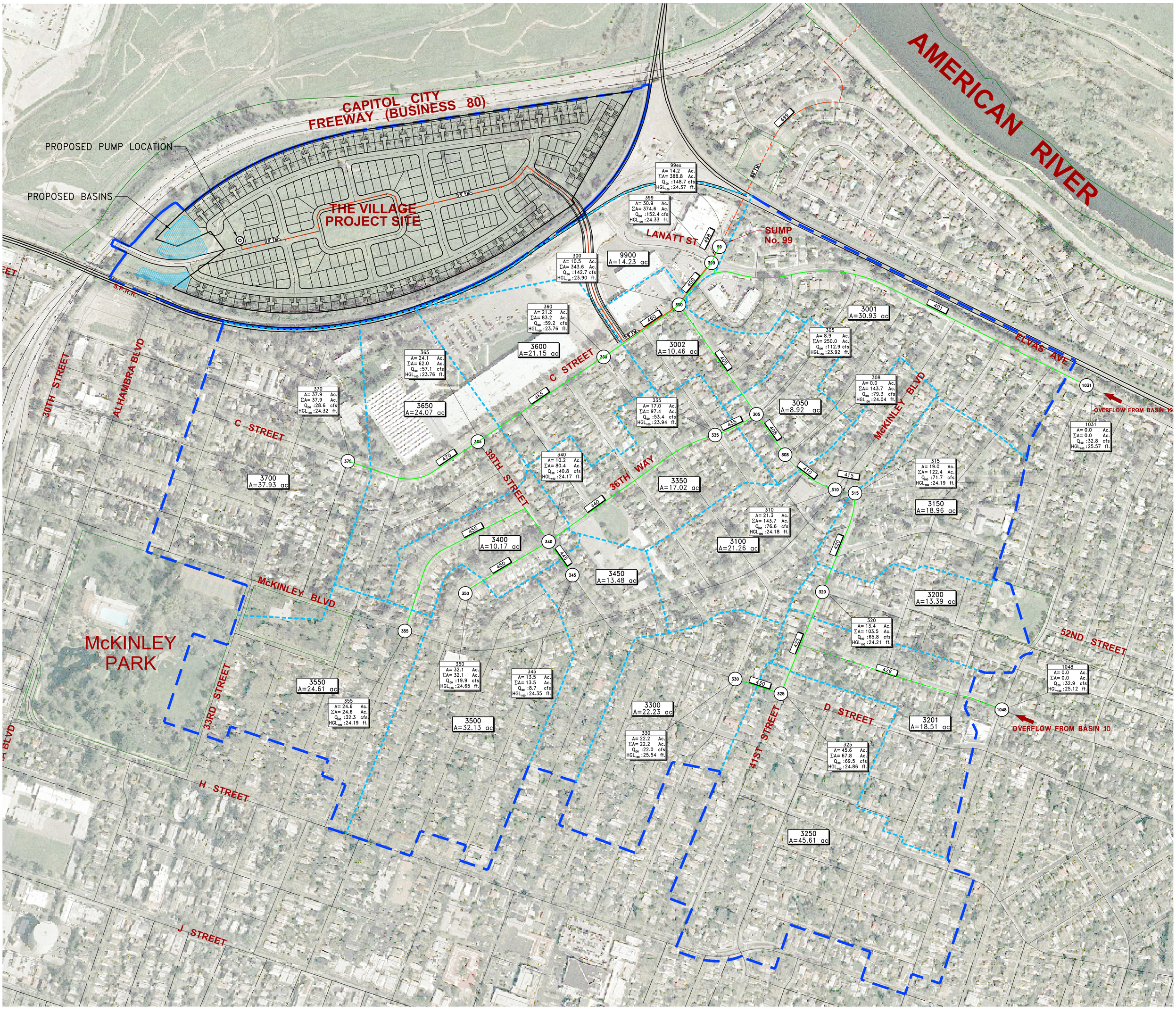
NORTH

0 200 400 800

LEGEND

- PROPOSED PUMP
- PROPERTY BOUNDARY
- 9900 A=14.23 ac — DRAIN SUBSHED
- 498 — CONDUIT
- 99 — DRAIN NODE
- PROPOSED FORCE MAIN
- EXISTING FORCE MAIN
- PROPOSED DRAIN LINE
- EXISTING DRAIN LINE
- BASIN 10 INTERCONNECTING DRAIN LINE
- DRAIN SHED – MAJOR
- DRAIN SHED – MINOR
- OVERLAND RELEASE DIRECTION

2	NODE NUMBER
A= 10.0 Ac.	SHED AREA
ΣA= 100.0 Ac.	CUMULATIVE AREA
Q_{100} :100.0 cfs	100 yr PEAK FLOW
HGL_{100} :10.0 ft.	100 yr HGL ELEV



WOOD RODGERS
ENGINEERING • MAPPING • PLANNING • SURVEYING
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

Appendix J2
Off-Site Drainage System at 100-Year 24-Hour Storm Event – Comparison of Existing and Proposed Conditions

APPENDIX J2: COMPARISON OF EXISTING AND PROPOSED CONDITION MODEL RESULTS AT OFF-SITE DRAINAGE NETWORK

						Existing				Proposed				
Link (Pipe) Name	Diameter(ft)	Upstream Node Name	Downstream Node Name	A(ac)	ΣA(ac)	Q_{100} (cfs)	V_{100} (fps)	Fr at 100-yr 24-hr storm	Max Upstream Water Elevation (ft) (100-yr	Q_{100} (cfs)	V_{100} (fps)	Fr at 100-yr 24-hr storm	Max Upstream Water Elevation (ft) (100-yr 24-	Difference in Max Water Elevation (ft)
Sump99ex	6.5	99ex	500ex	14.2	388.8	148.7	6.2		24.33	148.7	6.2		24.37	0.03
498ex	7.5	399	99ex	30.9	374.6	154.5	3.5	0.04	24.32	152.4	3.4	0.04	24.33	0.02
P400	7.0	300	399	10.5	343.6	136.8	3.5	0.04	23.94	142.7	3.7	0.03	23.90	-0.04
P460	4.0	360	300	21.2	83.2	59.3	4.7	0.11	23.77	59.2	4.7	0.09	23.76	-0.01
P465	3.5	365	360	24.1	62.0	57.2	5.9	0.22	23.77	57.1	5.8	0.13	23.76	-0.01
P470	3.0	370	365	37.9	37.9	28.3	3.9	0.17	24.32	28.6	4.0	0.11	24.32	0.00
P405	6.5	305	300	8.9	250.0	115.0	3.5	0.06	23.93	112.9	3.4	0.05	23.92	-0.01
P435	4.0	335	305	17.0	97.4	61.6	4.8	0.66	23.95	53.4	4.2	0.38	23.94	-0.01
P440	4.0	340	335	10.2	80.4	40.9	3.3	0.27	24.17	40.8	3.2	0.16	24.17	0.00
P455	2.5	355	340	24.6	24.6	32.3	6.5	0.60	24.19	32.3	6.5	0.42	24.19	0.00
P450	2.5	350	340	32.1	32.1	18.7	3.7	0.30	24.65	19.9	4.0	0.22	24.65	0.00
P445	1.8	345	340	13.5	13.5	7.9	3.2	0.42	24.35	8.7	3.5	0.53	24.35	0.00
P408	6.0	308	305	0.0	143.7	78.0	4.0	0.24	24.06	79.3	4.2	0.17	24.04	-0.02
P410	6.0	310	308	21.3	143.7	76.7	3.4	0.26	24.20	76.6	3.1	0.17	24.18	-0.01
P415	5.5	315	310	19.0	122.4	71.4	4.2	0.40	24.19	71.7	3.9	0.25	24.19	0.00
P420	5.0	320	315	13.4	103.5	66.3	3.4	0.35	24.21	65.8	3.3	0.23	24.21	-0.01
P425	4.3	325	320	45.6	67.8	69.4	4.7	0.37	24.87	69.5	4.7	0.38	24.86	-0.01
P430	2.5	330	325	22.2	22.2	22.4	4.5	0.39	25.55	22.0	4.4	0.40	25.54	-0.01
P427	4.0	321	320	0.0	0.0	-78.9	-6.2	0.40	24.22	-84.4	-6.7	0.41	24.21	-0.01
P426	4.0	1048	321	0.0	0.0	32.8	3.8	0.52	25.12	32.9	3.8	0.54	25.12	0.00
P402	3.0	301	399	0.0	0.0	39.3	9.0	0.28	25.09	38.9	9.0	0.25	25.04	-0.05
P401	3.0	1031	301	0.0	0.0	32.8	4.7	0.67	25.57	32.8	4.7	0.66	25.57	0.00

APPENDIX K
Water Quality & LID Facilities

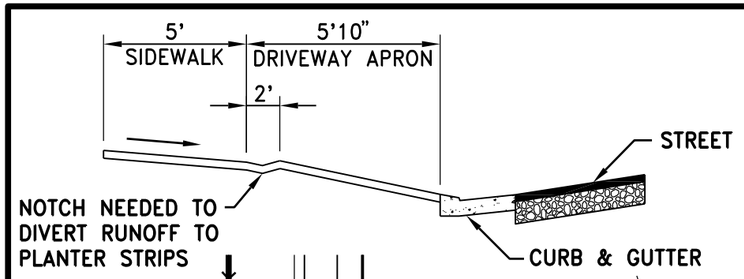
Appendix K1
Water Quality & LID Facilities
Sidewalk Planter Alley Driveway
Cross Gutter

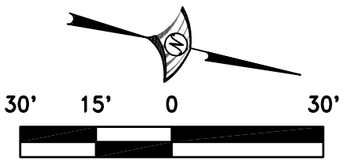
WATER QUALITY & LID FACILITIES
SIDEWALK PLANTER ALLEY DRIVEWAY CROSS GUTTER

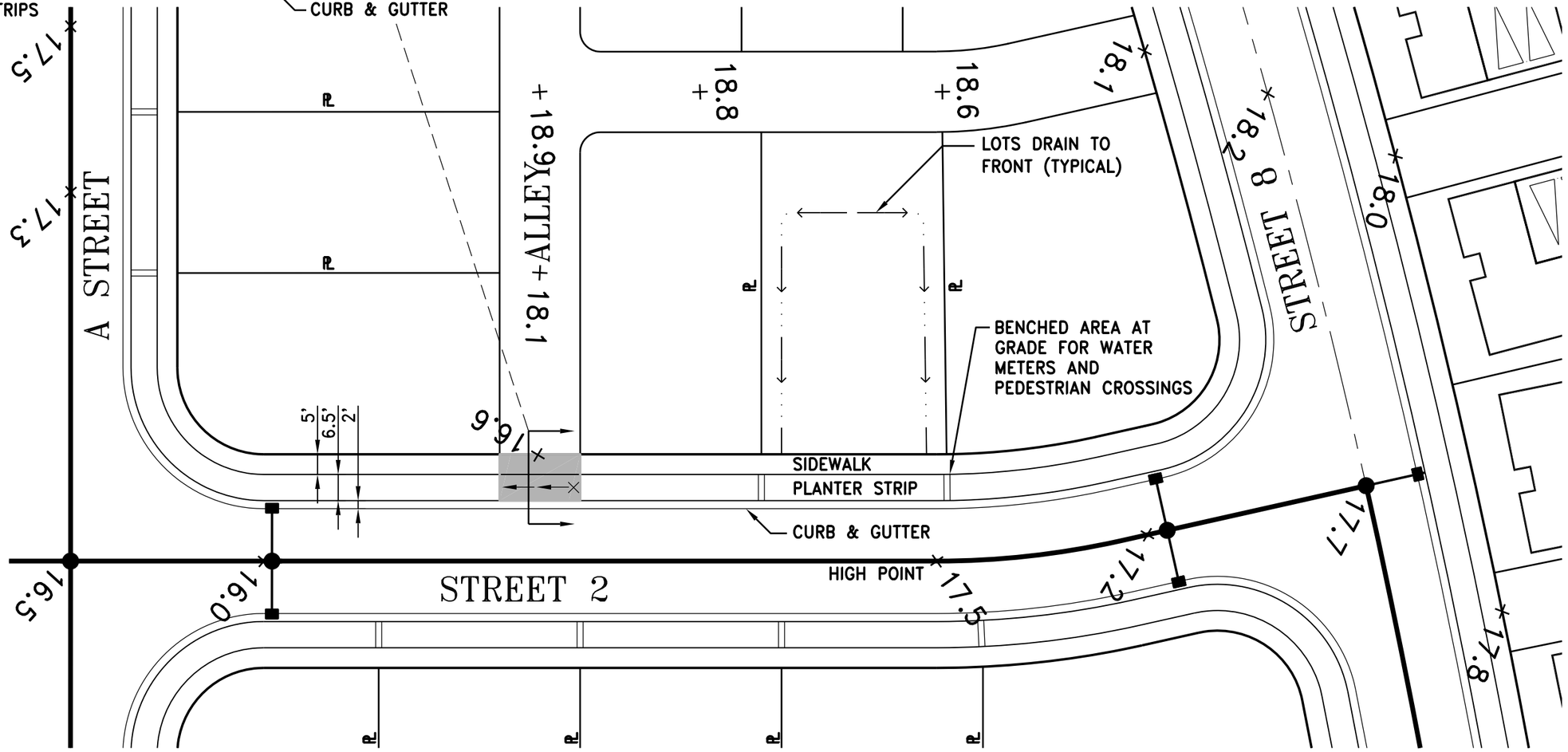
McKINLEY VILLAGE

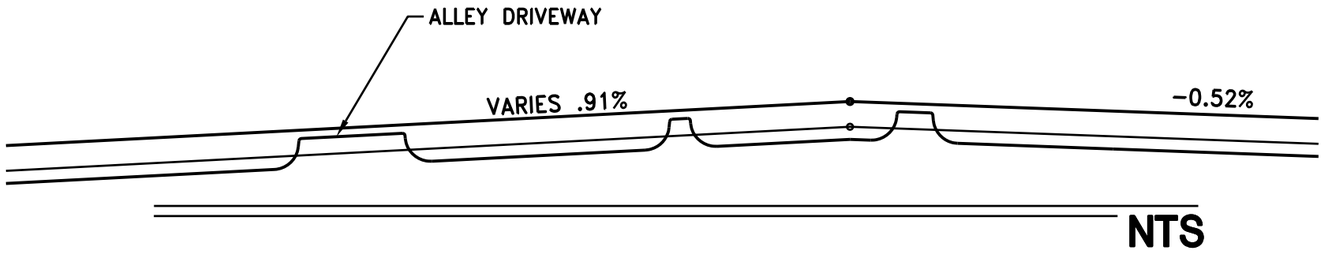
SACRAMENTO **CALIFORNIA**

SEPTEMBER, 2013









APPENDIX K-1

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Drain\EXH_DRIVEWAY_PLANTER_CROSS_SECTION.dwg 9/5/2013 10:50 AM Francisco Lopez

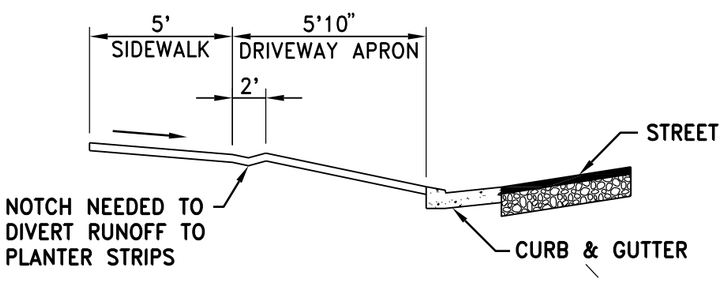
Appendix K2
Water Quality & LID Facilities
Sidewalk Planter T-Court Driveway Cross Gutter

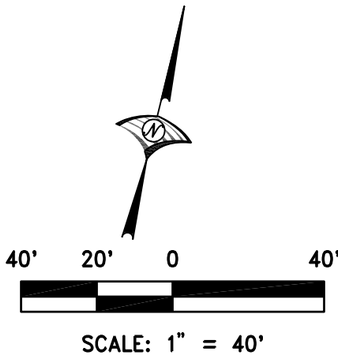
WATER QUALITY & LID FACILITIES
SIDEWALK PLANTER T-COURT DRIVEWAY CROSS GUTTER

McKINLEY VILLAGE

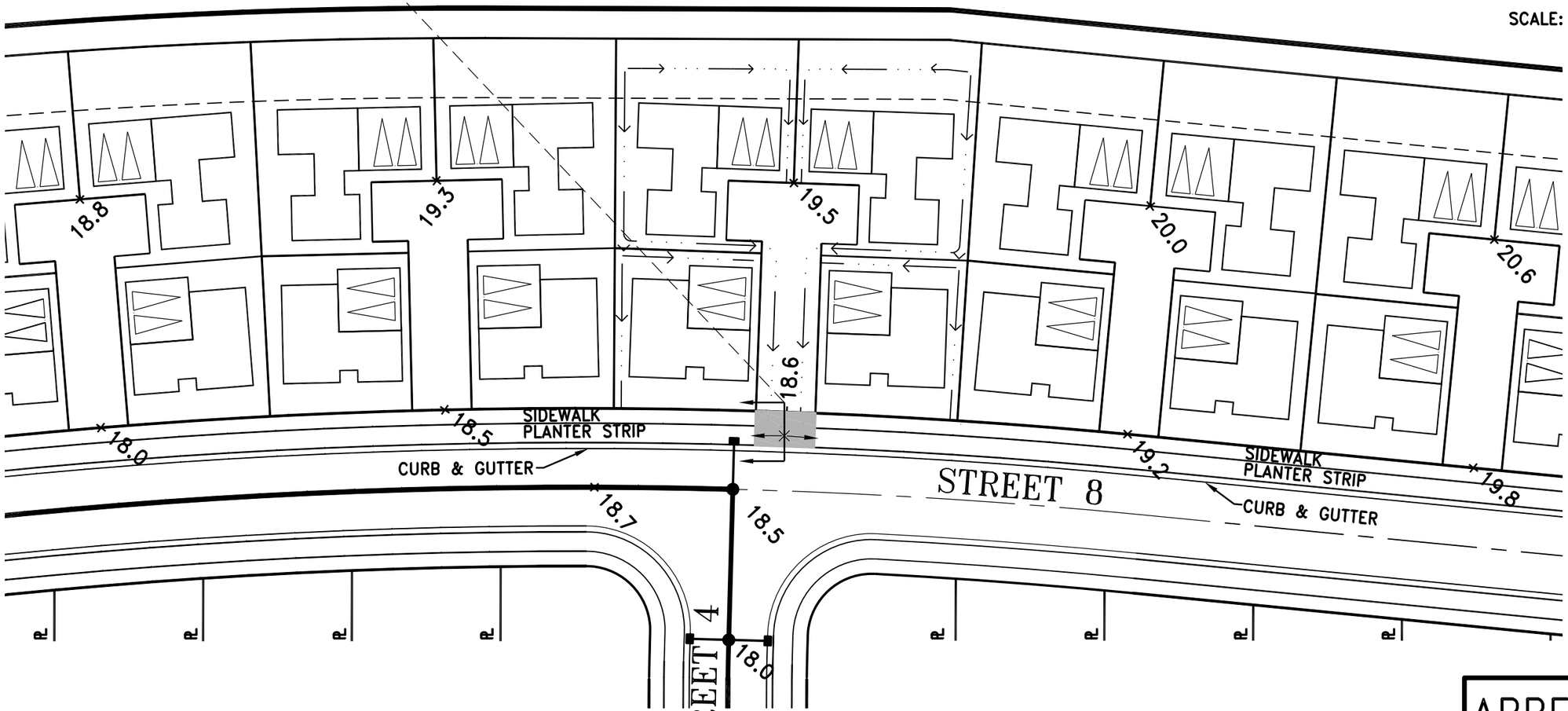
SACRAMENTO **CALIFORNIA**

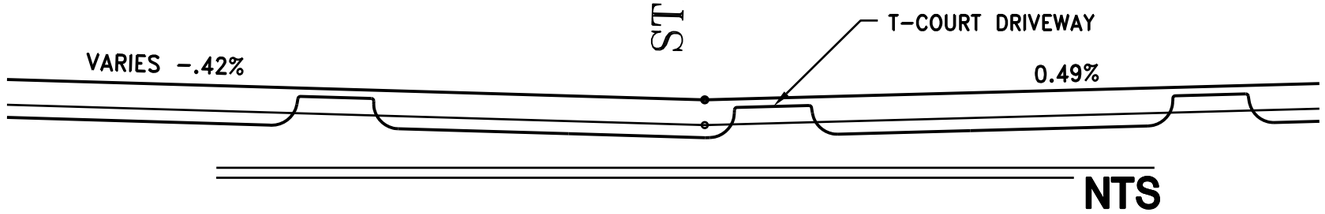
SEPTEMBER, 2013





SCALE: 1" = 40'





NTS

APPENDIX K-2

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

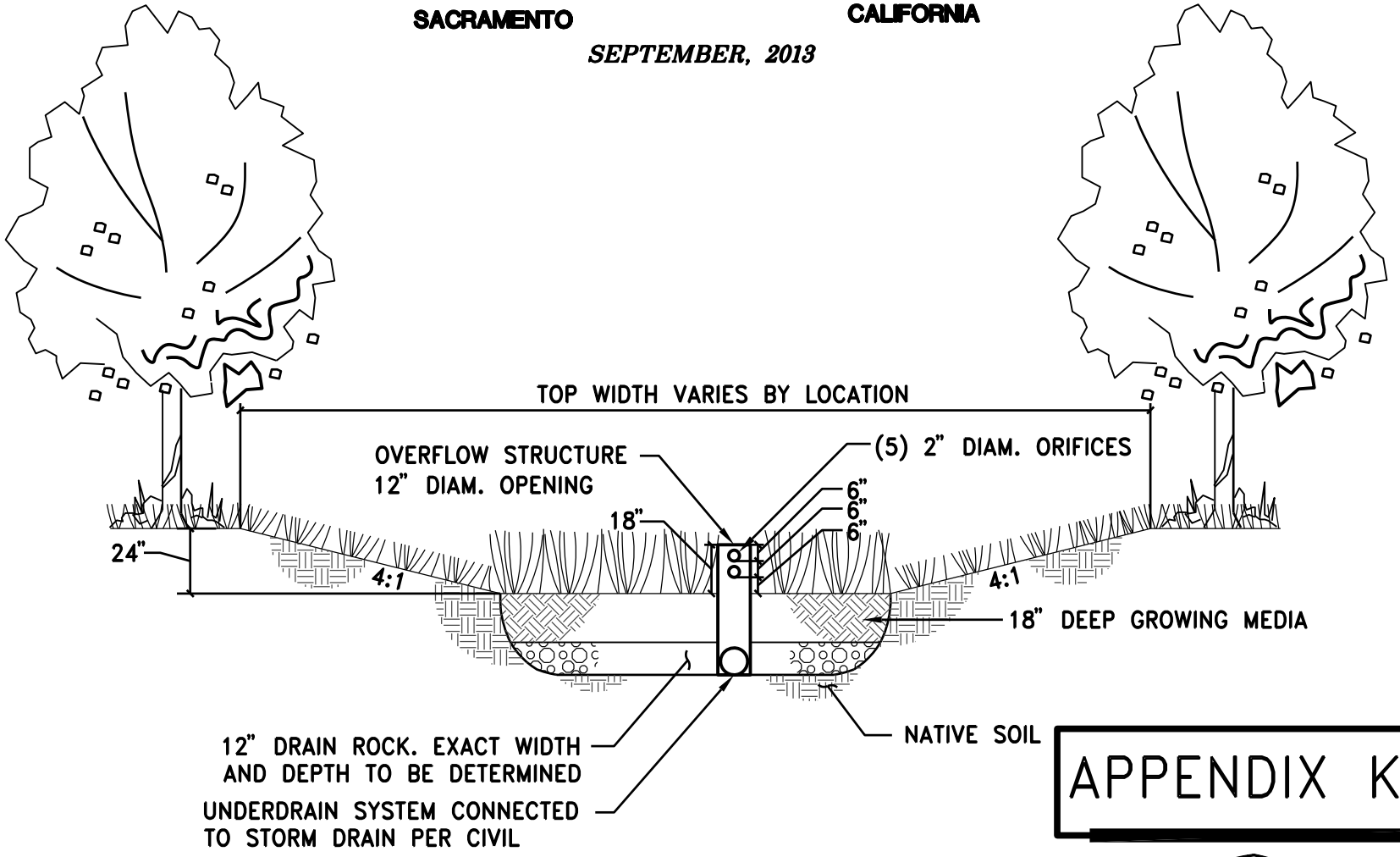
J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Drain\EXH_T-DRIVEWAY_PLANTER_CROSS_SECTION.dwg 9/5/2013 10:49 AM Francisco Lopez

Appendix K3
Water Quality & LID Facilities
Bioretention/Hydromodification Facility

WATER QUALITY & LID FACILITIES
BIORETENTION/HYDROMODIFICATION FACILITY
MCKINLEY VILLAGE

SACRAMENTO **CALIFORNIA**

SEPTEMBER, 2013



APPENDIX K-3

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

J:\1000-s\1262-McKinleyVillage\McKinley_Village\Civil\Studies\Grading\EXH_LID-H-M.dwg 9/05/13 10:51am flopez

APPENDIX L
Runoff Reduction Calculations

Appendix L - Runoff Reduction Calculations

Appendix D-1: Residential Sites: Runoff Reduction Credits and Treatment BMP Sizing Calculations

Name of Drainage Shed: B. Local Street
Project Located in Sacramento

Fill in Highlighted Boxes

Step 1 - Calculate Area Requiring Treatment

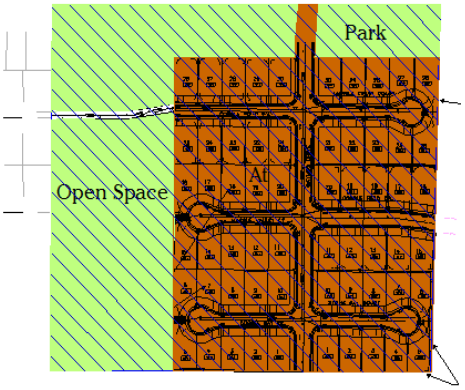
Drainage Shed Area		48.8 acres	A	
Open Space and Parks Acreage*		7.0	A_{OS}	
Treatment Area	$A - A_{OS} =$	41.8	A_T	**See Area Example Below**
Number of Units in A_T		328		
Number of units per acre in A_T	$DU/A_T =$	8		
Assumed Initial Impervious Fraction (determine using Table D-1a)		0.5	I	

*. Includes all areas maintained in a natural state and planned for landscaped park areas

Table D-1a

Dwelling units per acre	Imperviousness
1	0.17
2	0.25
3,4	0.35
5,6	0.40
7	0.50
8,9	0.55
10-14	0.60
15-20	0.70

A - Drainage Shed Area
Aos - Parks and Open Space
AT - Area with Runoff Reduction Potential



Step 2 - Calculate Impervious Area Treatments

Runoff Reduction Measures		Effective Area Managed (A_C)	
Disconnected Roof Drains (see Fact Sheet)	use Form D-1a for credits →	6.86	acres
Disconnected Pavement (see Fact Sheet)	use Form D-1b for credits →	1.67	acres
Interceptor Trees (see Fact Sheet)	use Form D-1c for credits →	1.61	acres
Alternative Driveway Design (see Fact Sheet)	use Form D-1d for credits →	1.67	acres
Total Effective Area Managed (Credit Area)		A_C 11.81	acres

Adjusted Area for Flow-Based Treatment	$A_T - A_C =$	29.99 acres	A_{AT}
Adjusted Impervious Fraction for A	$(A_T (I) - A_C) / A =$	0.19	I_A

Form D-1a: Disconnected Roof Drains Worksheet

See Fact Sheet for more information regarding Disconnected Roof Drain credit guidelines

Effective Area Managed (A_C)

1. Determine efficiency Multiplier

Runoff is directed to a dispersal trench or dry well (Type A and B soils only)		1.00
Runoff is directed across landscaping, determine setback		
25 ft +	Use multiplier of	1.00
≥ 20 and < 25 ft	Use multiplier of	0.90
≥ 15 and < 20 ft	Use multiplier of	0.70
≥ 10 and < 15 ft	Use multiplier of	0.45
≥ 5 and < 10 ft	Use multiplier of	0.25

Efficiency Multiplier → 0.70 Box J1

2. Determine percentage of roof drains disconnected → 80.0% Box J2

3. Select project density in dwelling units per acre:

1	Use reduction factor of	0.08
2	Use reduction factor of	0.13
3,4	Use reduction factor of	0.19
5,6	Use reduction factor of	0.23
7	Use reduction factor of	0.29
8,9	Use reduction factor of	0.33
10-14	Use reduction factor of	0.37
15-20	Use reduction factor of	0.44

Reduction Factor → 0.29 Box J3

4. Determine Area Managed

Multiply Box J3 by A_T, and enter the result in Box J4: 12.2 acres Box J4

5. Multiply Boxes J1, J2 and J4, and enter the Result in Box J: 6.9 acres Box J

This is the amount of area credit to enter into the "Disconnected Roof Drains" Box of Form D-1

Form D-1b: Disconnected Pavement Worksheet

See Fact Sheet for more information regarding NDC Pavement credit guidelines

Effective Area Managed (A_C)

Divided Sidewalks

1. Determine percentage of units with divided Sidewalks: 100.0% Box K1

Multiply Box K1, A_T, and 0.04 and enter the result in Box K: 1.67 acres Box K

This is the amount of area credit to enter into the "Disconnected Pavement" Box of Form D-1

Form D-1c: Interceptor Tree Worksheet

See Fact Sheet for more information regarding Interceptor Tree credit guidelines

Effective Area Managed (A_C)

New Evergreen Trees

1. Enter number of new evergreen trees that qualify as Interceptor Trees in Box L1: 25 trees Box L1

2. Multiply Box L1 by 200 and enter result in Box L2: 5000 sq. ft. Box L2

New Deciduous Trees

3. Enter number of new deciduous trees that qualify as Interceptor Trees in Box L3: 650 trees Box L3

4. Multiply Box L3 by 100 and enter result in Box L4: 65000 sq. ft. Box L4

Existing Tree Canopy

5. Enter square footage of existing tree canopy that qualifies as Existing Tree canopy in Box L5: 0 sq. ft. Box L5

6. Multiply Box L5 by 0.5 and enter the result in Box L6: 0 sq. ft. Box L6

Total Interceptor Tree Credits

Add Boxes L2, L4, and L6 and enter it into Box L7: 70000 sq. ft. Box L7

Divide Box L7 by 43,560 to get the number of acres effectively managed and enter the result in Box L8: 1.61 acres Box L8

This is the amount of area credit to enter into the "Interceptor Trees" Box of Form D-1

Form D-1d: Alternative Driveway Design

See Fact Sheet for more information regarding Alternative Driveway Design credit guidelines

1. Select type of driveway

Pervious Driveway:	Multiplier:
Cobblestone Block Porous Pavement	0.40
Pervious Concrete/Asphalt Pavement	0.60
Modular Block Porous Pavement Porous Gravel Pavement & Hollywood Driveway	0.75
Not Directly-connected Driveway	1.00

1 Box M1

2. Determine percentage of units with Alternative Driveways: 100% Box M2

4. Multiply Boxes M1, M2, A_T and 0.04, and enter the result in Box M
This is the amount of area credit to enter into the "Alternative Driveway Design" Box of Form D-1

1.67 acres Box M

Step 3 - Calculate Flow or Volume Requiring Treatment

Form D-1e Treatment - Flow-Based (Rational Method)

Calculate treatment flow (cfs): Flow = Runoff Coefficient x Rainfall Intensity x Adjusted Treatment Area

Determine C Factor using Table D-1b	0.50	C
Determine i using Table D-1c (Rainfall Intensity)	0.18	i
A_{AT} from Step 2	29.99	A_{AT}
Flow = C * i * A_{AT}	2.70	cfs

TABLE D-1b

Runoff Coefficient (Rational), C	
Single-family areas	0.50
Multi-units, detached	0.60
Apartment dwelling areas	0.70
Multi-units, attached	0.75
User Specified	0.00

Table D-1c

Rainfall Intensity			
Roseville	i =	0.20	in/hr
Sacramento	i =	0.18	in/hr
Folsom	i =	0.20	in/hr

Form D-1f Treatment - Volume-Based (CASQA)

Skip this, use Form D-1g for volume calculations

Calculate treatment volume (Acre-Feet): Treatment Volume = Area x (Storage Volume ÷ Conversion Factor)

Determine Adjusted C_A using Table D-2d (for CASQA Method) and the Adjusted Impervious Fraction (I_A) from Step 2	0.16	C_A	hrs Specified Draw Down time
Determine Unit Basin Storage Volume (Fig. D-2A) using C_A	0.10	SV	
A from Step 1	48.80	A	
Treatment volume = A_T x (SV / 12)	0.39	Acre-Feet	

Form D-1g Treatment - Volume-Based (ASCE-WEF)

Calculate water quality volume (Acre-Feet): WQV = Area x Maximized Detention Volume (P_0)

A from Step 1	48.80	A	24 hrs Specified Draw Down time
Obtain P_0: Maximized Detention Volume from figures E-1 to E-4 in Appendix E of this manual using I_A from Step 2.	0.14	P_0	
Treatment volume = A x (P_0 / 12)	0.56	Acre-Feet	

APPENDIX M
XPSWMM models (Electronic Files Only)

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C Street, Bldg. 100-B Tel: 916.341.7760
Sacramento, CA 95816 Fax: 916.341.7767