1st Draft
Sewer Feasibility Study
Hume SoCal

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July 2025

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Executive Summary

This Sewer Feasibility Study evaluates whether the existing wastewater infrastructure managed by Running Springs Water District (RSWD) can accommodate the phased expansion of the Hume SoCal Campground (Hume or "the Camp") in Green Valley Lake, California. The Camp is proposing an increase in occupancy from approximately 300 to 2,652 occupants across five phases. Sewer generation from the Camp flows through the Ahwahnee Lift Station, Deer Lick Lift Station, and ultimately the Running Springs Water District's Wastewater Treatment Plant. This study models the projected sewer flows from the expansion and assesses each infrastructure component's capacity to manage and convey those flows.

Flow projections were developed using the 2022 California Plumbing Code's generation of 50 gallons per capita per day, with peaking factors applied per San Bernardino County's standards. These flow projections were further supported by sewer generations for campers with central toilet and bath facilities outlined in *Wastewater Engineering: Treatment and Resource Recovery* (Metcalf & Eddy, Fifth Edition).

The Ahwahnee Lift station has a firm pumping capacity of 560 gallons per minute (GPM) and a total emergency storage volume of 40,950 gallons. The existing peak flow into the station is approximately 362 GPM from the Green Valley Lake service area. Projected flows from the Camp exceed firm capacity beginning in Phase 2, reaching 657 GPM at full build out. Under Phase 5 and existing pump conditions, emergency storage provides approximately 6.9 hours of peak inflow storage.

The Deer Lick Lift Station has a firm capacity of 520 GPM and 63,130 gallons of equalization storage. The existing peak inflow is approximately 547 GPM. The Camp's added flow exceeds the lift station's capacity beginning in Phase 1, with total peak inflow rising to 842 GPM by Phase 5. At full build out, the equalization basin provides approximately 3.2 hours of peak flow detention.

The Running Springs Water District Wastewater Treatment Plant is permitted for 1.0 million gallons per day (MGD), but is seasonally reduced to 0.5 MGD during summer months due to maintenance activities. Based on the current flow data and projected contributions from the Camp, the plant already exceeds its 0.5 MGD summer threshold in May and June. With Phase 3, the exceedance extends into July. By Phase 5, the combined flows exceed the summer capacity for May, June, July, and August.

Alternative treatment via on-site septic was investigated but deemed infeasible. The Camp lies within a septic prohibited zone governed by the Lahontan Basin Plan. While the Water Board suggested activated sludge as a potential treatment technology, they indicated that approval would be uncertain and cost-prohibitive compared to improvements to the existing sewer system.

Introduction

This sewer feasibility study analyzes the capacity of the existing downstream infrastructure of the Hume SoCal campground for the proposed expansion from a capacity of 300 occupants to 2,652 occupants (the Project). The sewer in Green Valley Lake is managed by Running Springs Water District (RSWD), which collects, treats, and disposes of the Camp's wastewater.

Project Location

The 251-acre Project site (APN 0328-071-05, 0328-071-07, 0328-071-10, 0328-121-40, 0328-121-42) is located immediately east of Green Valley Lake Road and approximately 0.4 miles northwest of State Route (SR) 18 in Green Valley Lake, CA. Green Valley Lake is in unincorporated San Bernardino County (the County). The Project is bounded by National Forest to the north, south, west, and east.

Existing System

Wastewater from the Project pumps into the existing Ahwahnee Lift Station and travels through the Green Valley Lake Road 8-inch force main for 2994 linear feet (LF). It transitions to an 8 to 10-inch gravity main that follows Green Valley Lake Road for 5058 LF. Near the intersection of Green Valley Lake Road and SR-18, a double 8-inch inverted siphon and 8-inch sewer gravity main connect to an 8-10" gravity sewer main on SR-18, which leads to the existing Deer Lick Lift Station.

The Deer Lick Lift Station pumps the wastewater into an 8-inch force main in SR-18. After 4217 LF, the force main transitions to a 10-inch to 15-inch gravity sewer main, which also includes 2179 LF of a double 8-inch inverted siphon between Hunsaker Way and Old City Creek Road. The 10-inch to 15-inch gravity sewer main conveys the wastewater to the RSWD Wastewater Treatment Plant (WWTP).

Table 1 displays the lengths of the existing sewer pipes between the Ahwahnee Lift Station and RSWD WWTP. The existing system is illustrated in Exhibit 1. Information and lengths of the system was found from as-builts in Appendix A.

Table 1: Length of Existing Pipe from Ahwahnee Lift Station to RSWD WWTP

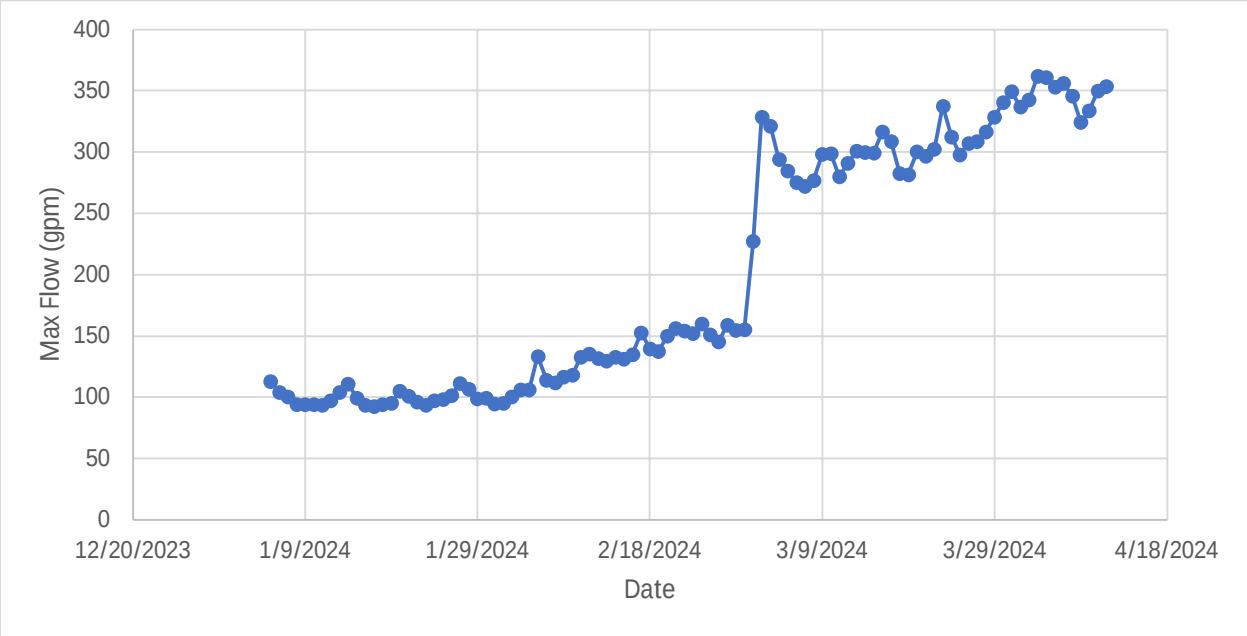
Pipe	Length (ft)
Ahwahnee Lift Station to Deer Lick Lift Station	
8" Force Main	2994
8"-10" Gravity	13764
Double 8" Inverted Siphon	1146
Deer Lick Lift Station to RSWD WWTP	
8" Force Main	4217
8"-10" Gravity	8320
Double 8" Inverted Siphon	2179

Ahwahnee Lift Station

The Ahwahnee Lift Station was constructed in 1974 and expanded in 2014. The lift station is located along Green Valley Lake Road, east of the Project. The lift station serves the Green Valley Lake service area and the Camp. The lift station has two 560 gallons per minute (GPM) pumps with a total dynamic head of 130 ft. This results in a firm pump capacity of 560 GPM and a total pumping capacity of 1,120 GPM. The original wet well has a volume of 950 gallons, and the lift station has two 20,000-gallon tanks for emergency storage. The lift station has a total peak flow storage of 40,950 gallons.

Sewer flow monitoring provided flow data for Manhole #7, upstream of the Ahwahnee Lift Station, from January 2024 to April 2024. This data was assumed to represent all flow into the lift station, except for the Camp flow. The peak flow seen by the lift station was 361.90 GPM. See Figure 1 for the maximum flow of the Ahwahnee Lift Station throughout the monitoring period of January 2024 to April 2024.

Figure 1: Existing Ahwahnee Lift Station Max Flow (GPM) from 01/2024 to 04/2024



Deer Lick Lift Station

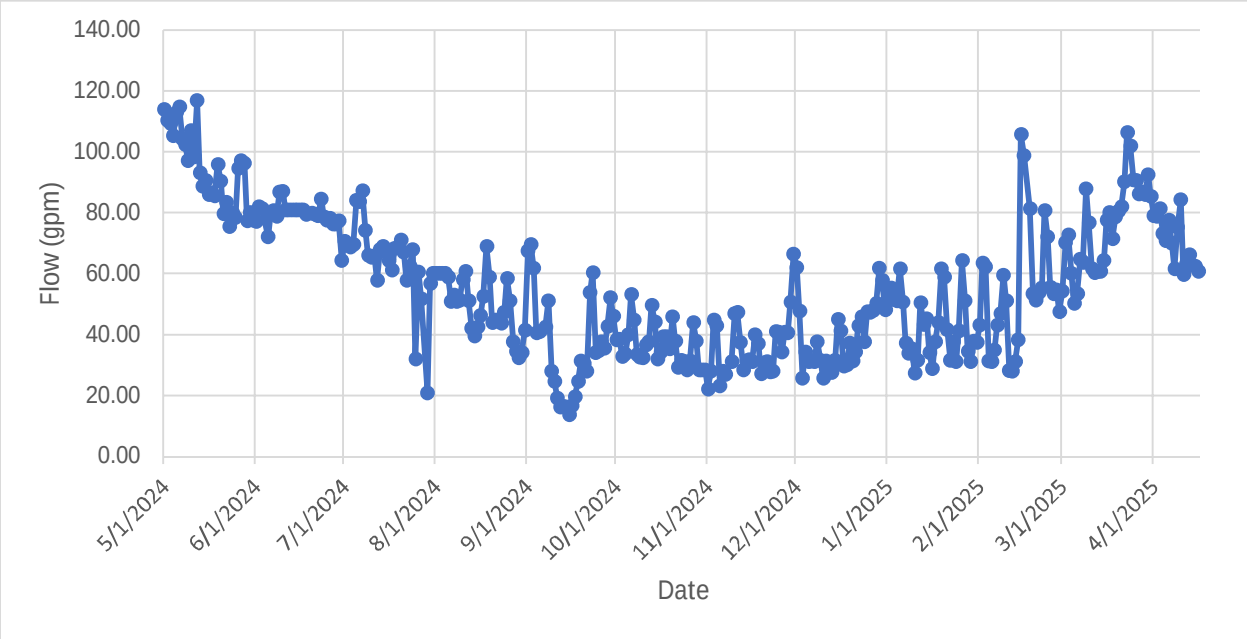
The Deer Lick Lift Station was constructed in 1976 and is located along SR-18. The lift station serves Green Valley Lake, Snow Valley, Hume Lake Camp, Camp Cedar Crest, and Pondo Camp. The lift station has two 520 GPM pumps with a total dynamic head of 145 ft. This results in a firm pump capacity of 520 GPM and a total pumping capacity of 1,040 GPM. The wet well has a volume of 630 gallons, and the lift station has a 62,500-gallon equalization basin for peak flow storage. The lift station has a total peak flow storage of 63,130 gallons.

RSWD provided flow data for the Deer Lick Lift Station from January 2024 to April 2025. However, to accurately compare the Ahwahnee and Deer Lick Lift Stations, analysis for the Deer Lick Lift Station was done using flow from January 2024 to April 2024, which is the same monitoring period as the data provided for the Ahwahnee Lift Station.

The peak flow seen by the lift station was 546.88 GPM. In accordance with Appendix B, the *2012 County of San Bernardino Standards for Sanitary Sewer (SB County Standards),* a peaking factor of 3.0 was applied to the lift station's maximum average value (182.29 GPM) to obtain the peak flow. See Figure 2 for the average daily flow of the Deer Lick Lift Station throughout the monitoring period of January 2024 to April 2025.

If all the RSWD-provided data (January 2024 to April 2025) were analyzed, a lower peak flow would have been found. Instead, by analyzing January 2024 to April 2024, the resulting peak flow used for further analysis is a conservative value.

Figure 2: Existing Deer Lick Lift Station Average Flow (GPM) from 01/2024 to 04/2025



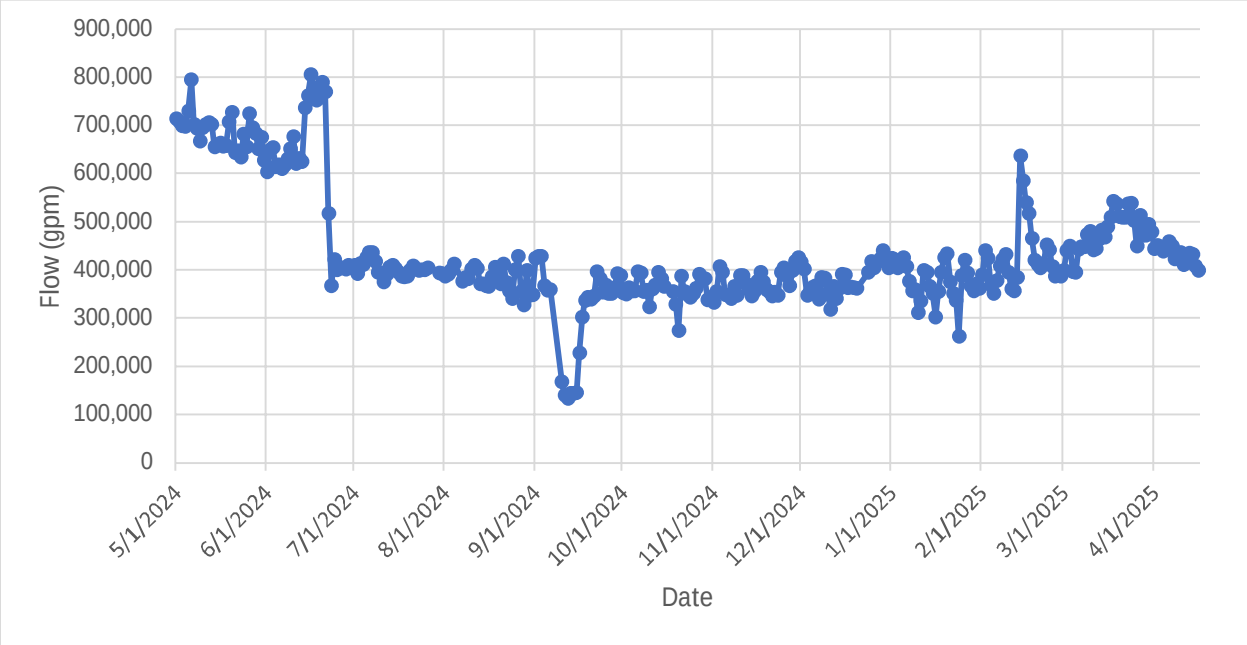
RSWD Wastewater Treatment Plant

The RSWD Wastewater Treatment Plant, constructed in 1978, is located off Fredalba Road at 3400 Sewer Plant Road. The plant is ruled under permit WDR1000036054. The treatment plant has a total capacity of 1 million gallons per day (MGD). During the summer months, its capacity will lower to 0.5 MGD due to maintenance of the plant.

RSWD provided flow data for the treatment plant from May 2024 to April 2025. See Figure 3 for the average RSWD WWTP flow throughout the monitoring period.

The flow data provided exhibits several anomalies, including spikes and drops in reported flows that do not align with expected seasonal patterns. These anomalies likely reflect isolated operational events, data collection errors, or temporary maintenance conditions rather than typical base conditions. Before proposed improvements can be fully identified, it is recommended that these anomalies be reviewed and resolved with RSWD to establish accurate baseline flow.

Figure 3: Existing RSWD WWTP Average Flow (GPM) from 05/2024 to 04/2025



Projected Flows

Development of the Project will be completed in five phases. For analysis of the impact of each phase and the total impact of the Project on the system, projected sewer generation rates and flows were first determined.

The number of guests per phase was provided by the Camp. The difference between the total guests and the estimated total occupants during Phase 5 (provided by the Camp) was calculated to find the total estimated number of employees. This value was scaled proportionally and added to the increase of guests per phase.

Shown in Appendix C, the *2022 California Plumbing Code (Appendix H, Table H 201.1(4))* standard for summer and seasonal camps provided a sewer generation value of 50 gallons per capita per day (GPCPD). Although this value is meant for septic systems, it was assumed to provide an accurate reflection of sewage flow rates for the Camp. This value was multiplied by each phase's total occupants to find the average sewer generation per phase.

To further support the use of the 50 GPCPD sewer generation rate, reference was made to *Wastewater Engineering: Treatment and Resource Recovery* (Metcalf & Eddy, Fifth Edition). Table 3-5, "Typical Wastewater Flowrates from Recreational Facilities in the United States," provides daily average sewage flow values for recreational facilities similar to those at the Camp. For campers using central toilet and bath facilities, the listed value is 33.8 GPCPD. Additionally, dining hall wastewater is estimated at 5.3 gallons per meal served. Assuming three meals per day per camper, this results in an additional 15.9 GPCPD, yielding a total of 49.7 GPCPD per camper.

This value closely aligns with the 50 GPCPD provided in the *2022 California Plumbing Code* for summer and seasonal camps. Accordingly, the 50 GPCPD figure was used for estimating average daily sewer generation across all phases of the Project.

The proposed average daily sewer generation for each occupant type per phase (including employees) is shown in Table 2.

Table 2: Proposed Average Sewer Generation per Phase

Occupant Type	Phase	Guests	Average Sewer Generation per Phase (GPD)[1]
Middle School Guests	1	784	40,700
High School Guests	2	1000	51,919
Adult Lodge	3	140	7,269
Elementary Age Guests	4	500	25,959
Wildwood Camp	5	130	6,749

1 = Average Sewer Generation per Phase including estimated employees.

In accordance with the *SB County Standards*, a peaking factor of 3.2 was applied to the average daily demand to determine peak flow for the Camp. The total projected flows for each phase are shown in Table 3 and Table 4.

Table 3: Camp Projected Flows (GPD)

Phase	Average Flow (GPD)	Cumulative Average Flow (GPD)	Peak Flow (GPD)	Cumulative Peak Flow (GPD)
Phase 1	40,700	40,700	130,240	130,240
Phase 2	51,919	92,619	166,139	296,379
Phase 3	7,269	99,887	23,260	319,639
Phase 4	25,959	125,846	83,070	402,709
Phase 5	6,749	132,596	21,598	424,307

Table 4: Camp Projected Flows (GPM)

Phase	Average Flow (GPM)	Cumulative Average Flow (GPM)	Peak Flow (GPM)	Cumulative Peak Flow (GPM)
Phase 1	28.26	28.26	90.44	90.44
Phase 2	36.05	64.32	115.37	205.82
Phase 3	5.05	69.37	16.15	221.97
Phase 4	18.03	87.39	57.69	279.66
Phase 5	4.69	92.08	15.00	294.66

Seasonal Variation

The camp occupancy per month in Phase 5 was provided by the Camp. Because of the difference in camp occupancy between seasons, the proposed camp seasonal flow variations were calculated to provide an accurate assessment of the impact of the Camp's expansion on the system.

The total number of guests was divided by the total Phase 5 guests to obtain a percentage that was used to scale the camp occupancy for Phases 1-4. Average flow and peak flows were calculated using the same methodology from Table 3, utilizing the *2022 California Plumbing Code* standard of 50 gallons per capita per day (GPCPD) and the *SB County Standards* peaking factor of 3.2.

Table 5 through Table 9 display the proposed seasonal flow variations from Phase 1 through 5.

Table 5: Phase 1 – Proposed Camp Seasonal Flow Variations

Month	Camp Occupancy	Average Flow (GPD)	Peak Flow (GPD)
January	91	4,528	14,489
February	96	4,789	15,324
March	79	3,929	12,573
April	93	4,651	14,882
May	91	4,528	14,489
June	621	31,035	99,311
July	814	40,704	130,253
August	462	23,115	73,967
September	103	5,142	16,454
October	91	4,528	14,489
November	103	5,142	16,454
December	100	5,004	16,012

Table 6: Phase 2 – Proposed Camp Seasonal Flow Variations

Month	Camp Occupancy	Average Flow (GPD)	Peak Flow (GPD)
January	206	10,303	32,970
February	218	10,897	34,870
March	179	8,941	28,611
April	212	10,582	33,864
May	206	10,303	32,970
June	1412	70,620	225,983
July	1852	92,623	296,393
August	1052	52,598	168,313
September	234	11,700	37,440
October	206	10,303	32,970
November	234	11,700	37,440
December	228	11,386	36,434

Table 7: Phase 3 – Proposed Camp Seasonal Flow Variations

Month	Camp Occupancy	Average Flow (GPD)	Peak Flow (GPD)
January	222	11,112	35,557
February	235	11,752	37,606
March	193	9,643	30,856
April	228	11,413	36,521
May	222	11,112	35,557
June	1523	76,161	243,717
July	1998	99,891	319,652
August	1135	56,726	181,522
September	252	12,618	40,378
October	222	11,112	35,557
November	252	12,618	40,378
December	246	12,279	39,294

Table 8: Phase 4 – Proposed Camp Seasonal Flow Variations

Month	Camp Occupancy	Average Flow (GPD)	Peak Flow (GPD)
January	280	13,999	44,797
February	296	14,806	47,379
March	243	12,148	38,875
April	288	14,379	46,012
May	280	13,999	44,797
June	1919	95,954	307,053
July	2517	125,851	402,722
August	1429	71,467	228,695
September	318	15,897	50,872
October	280	13,999	44,797
November	318	15,897	50,872
December	309	15,470	49,505

Table 9: Phase 5 – Proposed Camp Seasonal Flow Variations

Month	Camp Occupancy	Average Flow (GPD)	Peak Flow (GPD)
January	295	14,750	47,200
February	312	15,600	49,920
March	256	12,800	40,960
April	303	15,150	48,480
May	295	14,750	47,200
June	2,022	101,100	323,520
July	2,652	132,600	424,320
August	1,506	75,300	240,960
September	335	16,750	53,600
October	295	14,750	47,200
November	335	16,750	53,600
December	326	16,300	52,160

Proposed Analysis

Ahwahnee Lift Station

The flow from the Camp will initially be pumped into the Ahwahnee Lift Station, which has a firm pump capacity of 560 GPM. The proposed cumulative flow through the lift station was calculated by combining the proposed flows from each phase of the Camp from Table 4 with the existing lift station peak flow of 361.90 GPM.

Table 10 shows the proposed Ahwahnee Lift Station flows after each phase of the Camp expansion. The flows from Phase 2 to 5 exceed the firm capacity of the lift station of 560 GPM. Due to the increased flow, the pumps within the Ahwahnee Lift Station will also have increased run times.

The Ahwahnee Lift Station has two 20,000-gallon storage tanks that were analyzed to determine the amount of storage at full pump capacity. Table 11 displays the storage capacity of the Ahwahnee Lift emergency storage tanks for each phase. At Phase 5, the emergency storage tanks can store peak flow for around 7 hours.

Table 10: Proposed Ahwahnee Lift Station Flows

Phase	Camp Peak Flow (GPM)	Cumulative Peak Flow (GPM)	Existing Ahwahnee Lift Station Peak Flow (GPM)	Proposed Cumulative Flow (GPM)
Phase 1	90.44	90.44	361.90	452.34
Phase 2	115.37	205.82	361.90	567.72
Phase 3	16.15	221.97	361.90	583.87
Phase 4	57.69	279.66	361.90	641.56
Phase 5	15.00	294.66	361.90	656.56

Table 11: Proposed Ahwahnee Lift Station Storage Capacity

Phase	Storage Capacity[2]	Units
Phase 1	-371.56[3]	min
	-6.19[3]	hr
Phase 2	5,182.00	min
	86.37	hr
Phase 3	1,675.64	min
	27.93	hr
Phase 4	490.44	min
	8.17	hr
Phase 5	414.26	min
	6.90	hr

2 = At peak flow conditions, assuming continuous pump use.
3 = Pump capacity is greater than proposed cumulative flow in; continuous pump use will handle peak flow.

Conveyance from Ahwahnee Lift Station to Deer Lick Lift Station

Because the pumps are the limiting factor in the system, the existing force and gravity mains from the Ahwahnee Lift Station to the Deer Lick Lift Station were assumed to remain at their existing capacity. The capacity of the existing gravity mains was calculated using an n of 0.013 for PVC pipes and a maximum d/D of 0.50, from the *SB County Standards*.

The existing 8-inch force main can handle flows up to 1,253 GPM and the double 8-inch inverted siphon can handle up to 2,506 GPM, with a maximum velocity of 8 ft/s. Ahwahnee Lift Station's maximum pumping capacity of 560 GPM is the highest flow rate experienced within the system and restricts the system to this lower value.

Table 12 displays the capacity of the sewer mains from the Ahwahnee Lift Station to the Deer Lick Lift Station.

Table 12: Existing Ahwahnee Lift Station Conveyance Capacity

Pipe Size (in)	Slope (%)	Flowrate (GPM)
8" Gravity	1	271.17
	3	469.68
	5	606.36
10" Gravity	1	491.67
	3	851.59
	5	1,099.40
8" FM Capacity		1,253.28
Double 8" Inverted Siphon		2,506.57

Deer Lick Lift Station

The flow from the Ahwahnee Lift Station will be pumped to the Deer Lick Lift Station, which has a firm pump capacity of 520 GPM. The proposed cumulative flow through the lift station was calculated by combining the proposed flows from each phase of the Camp from Table 4 with the existing lift station peak flow of 546.88 GPM. The existing flow from Ahwahnee was included in the existing Deer Lick peak flow. Therefore, the proposed flows from the Camp at each phase were added to peak flow at the Deer Lick Lift Station for this analysis.

Table 13 shows the proposed Deer Lick Lift Station flows after each phase of the Camp expansion.

The Deer Lick Lift Station has one 65,000-gallon equalization basin that was analyzed to determine the amount of storage at full pump capacity. Table 14 displays the storage capacity of the Deer Lick Lift equalization basin for each phase. At Phase 5, the equalization basin can store peak flow 3.24 hours.

Table 13: Proposed Deer Lick Lift Station Flows

Phase	Camp Peak Flow (GPM)	Existing Deer Lick Lift Station Peak Flow (GPM)	Proposed Cumulative Flow (GPM)
Phase 1	90.44	546.88	637.32
Phase 2	205.82	546.88	752.69
Phase 3	221.97	546.88	768.85
Phase 4	279.66	546.88	826.53
Phase 5	294.66	546.88	841.53

Table 14: Proposed Deer Lick Lift Station Storage Capacity

Phase	Storage Capacity[4]	Units
Phase 1	532.73	min
	8.88	hr
Phase 2	268.59	min
	4.48	hr
Phase 3	248.85	min
	4.19	hr
Phase 4	203.89	min
	3.40	hr
Phase 5	194.38	min
	3.24	hr

4 = At peak flow conditions, assuming continuous pump use.

Conveyance from Deer Lick Lift Station to RSWD WWTP

Because the pumps are the limiting factor in the system, the existing force and gravity mains from the Deer Lick Lift Station to the RSWD WWTP were assumed to remain at their existing capacity. The capacity of the existing gravity mains was calculated using an n of 0.013 for PVC pipes and a maximum d/D of 0.67, from the *SB County Standards*.

The existing 8-inch force main can handle flows up to 1,253 GPM and the double 8-inch inverted siphon can handle up to 2,506 GPM, with a maximum velocity of 8 ft/s. Deer Lick Lift Station's maximum pumping capacity of 1,040 GPM is the highest flow rate experienced within the system and restricts the system to this lower value.

Table 15 displays the capacity of the sewer mains from the Deer Lick Lift Station to the RSWD WWTP.

Table 15: Existing Deer Lick Lift Station Conveyance Capacity

Pipe Size (in)	Slope (%)	Flowrate (GPM)
8" Gravity	1	271.17
	3	469.68
	5	606.36
10" Gravity	1	491.67
	3	851.59
	5	1,099.40
12" Gravity	1	799.51
	3	1,384.78
	5	1,787.75
15" Gravity	1	1,449.60
	3	2,510.78
	5	3,241.40
8" FM Capacity		1,253.28
Double 8" Inverted Siphon		2,506.57

RSWD Wastewater Treatment Plant

The RSWD Wastewater Treatment Plant has a total capacity of 1.0 MGD, but during the summer months, its capacity will decrease to 0.5 MGD for maintenance of the treatment plant. The proposed combined flow from the existing system and the proposed Camp expansion was calculated to determine the phases and months that the combined flow would exceed capacity. The average Hume Camp flow was obtained from the proposed seasonal variation tables Table 5 through Table 9. Existing plant flow was provided by SCADA (Supervisory Control and Data Acquisition) data.

Table 16 through Table 20 represent proposed combined RSWD WWTP flows for Phase 1-5. Based on the SCADA data, existing plant flow exceeds the WWTP capacity of 0.5 MGD in May and June. With the proposed RSWD WWTP flows after the Camp expansion, Phase 3 causes May, June, and July to exceed capacity. Phase 5 causes May, June, July, and August combined flows to exceed capacity.

Table 16: Phase 1 – Proposed RSWD WWTP Flows

Month	Average Hume Camp Flow (GPD)	Existing Plant Flow (GPD)	Combined Average Flow (GPD)
January	4,528	375,935	380,463
February	4,789	427,929	432,718
March	3,929	475,645	479,574
April	4,651	432,875	437,526
May	4,528	685,968	690,496
June	31,035	603,133	634,168
July	40,704	402,893	443,597
August	23,115	382,207	405,322
September	5,142	314,593	319,735
October	4,528	359,483	364,011
November	5,142	372,033	377,175
December	5,004	380,821	385,825

Table 17: Phase 2 – Proposed RSWD WWTP Flows

Month	Average Hume Camp Flow (GPD)	Existing Plant Flow (GPD)	Combined Average Flow (GPD)
January	10,303	375,935	386,238
February	10,897	427,929	438,826
March	8,941	475,645	484,586
April	10,582	432,875	443,457
May	10,303	685,968	696,271
June	70,620	603,133	673,753
July	92,623	402,893	495,516
August	52,598	382,207	434,805
September	11,700	314,593	326,293
October	10,303	359,483	369,786
November	11,700	372,033	383,733
December	11,386	380,821	392,207

Table 18: Phase 3 – Proposed RSWD WWTP Flows

Month	Average Hume Camp Flow (GPD)	Existing Plant Flow (GPD)	Combined Average Flow (GPD)
January	11,112	375,935	387,047
February	11,752	427,929	439,681
March	9,643	475,645	485,288
April	11,413	432,875	444,288
May	11,112	685,968	697,080
June	76,161	603,133	679,294
July	99,891	402,893	502,784
August	56,726	382,207	438,933
September	12,618	314,593	327,211
October	11,112	359,483	370,595
November	12,618	372,033	384,651
December	12,279	380,821	393,100

Table 19: Phase 4 – Proposed RSWD WWTP Flows

Month	Average Hume Camp Flow (GPD)	Existing Plant Flow (GPD)	Combined Average Flow (GPD)
January	13,999	375,935	389,934
February	14,806	427,929	442,735
March	12,148	475,645	487,793
April	14,379	432,875	447,254
May	13,999	685,968	699,967
June	95,954	603,133	699,087
July	125,851	402,893	528,744
August	71,467	382,207	453,674
September	15,897	314,593	330,490
October	13,999	359,483	373,482
November	15,897	372,033	387,930
December	15,470	380,821	396,291

Table 20: Phase 5 – Proposed RSWD WWTP Flows

Month	Average Hume Camp Flow (GPD)	Existing Plant Flow (GPD)	Combined Average Flow (GPD)
January	23,600	375,935	399,535
February	24,960	427,929	452,889
March	20,480	475,645	496,125
April	24,240	432,875	457,115
May	23,600	685,968	709,568
June	161,760	603,133	764,893
July	212,160	402,893	615,053
August	120,480	382,207	502,687
September	26,800	314,593	341,393
October	23,600	359,483	383,083
November	26,800	372,033	398,833
December	26,080	380,821	406,901

Septic System Analysis

An on-site wastewater treatment system (OWTS) was evaluated for wastewater treatment and disposal for this site. Geotechnical data, estimated flows, and other site parameters were analyzed for their compliance with the San Bernardino County Local Agency Management Plan (LAMP), the Lahontan Basin Plan, and the Water Quality Control Board's (Water Board) OWTS Policy. The LAMP states that flows exceeding 10,000 GPD fall under the Water Board's jurisdiction.

This site lies within the Mojave Hydrological Unit adjacent to Deep Creek at approximately 6400 ft of elevation. The Lahontan Basin plan prohibits the discharge of waste to land or water in the Mojave Hydrologic Unit if in the Deep Creek watershed above elevation 3,200 feet to protect the surface and ground waters of the area. Exceptions can be made if it is proven that the waste discharge will not decrease the water quality relative to the objectives in the area.

Using GeoTracker to investigate existing facilities nearby, a camp within the same hydrological area was discovered with multiple septic systems permitted on-site to treat wastewater flows. This led to discussion with the Lahontan Water Board to inquire about septic feasibility for this facility.

Per discussion with the Lahontan Water Board, a conventional septic system is not a feasible treatment method for this site due to the Basin Plan's septic prohibition zone that the facility resides in. Facilities nearby with septic systems were permitted or designed prior to the 1975 prohibition.

If on-site wastewater treatment and disposal was the only option for this site, an alternative treatment system (ATS) would be required according to conditions set by the Water Board. Based on preliminary information, the Lahontan Water Board suggested activated sludge treatment as an option for this application. However, the Lahontan Water Board cannot confirm approval of any on-site wastewater treatment system before an official review.

Design of an ATS, such as an activated sludge treatment system, can be costly to design, build, and operate. With connection to an existing sewer system, it is likely of greater benefit to the developer and the Water Board to make improvements to the existing sewer system compared to designing and operating a small wastewater treatment plant on-site.

Conclusion

This sewer feasibility study evaluates the capacity of the existing wastewater infrastructure managed by RSWD to accommodate the proposed expansion of the Hume SoCal campground. This includes the Ahwahnee Lift Station, the Deer Lick Lift Station, and the RSWD WWTP. Additionally, the study evaluates the impact of the proposed phased expansion of the Camp on the existing infrastructure.

The study finds that the proposed expansion of the Camp will strain the existing wastewater infrastructure. For the Ahwahnee Lift Station, Phases 2 to 5 of the expansion will exceed the pumping capacity of 560 GPM. Additionally, in Phase 5, based on the proposed peak flow of 95.56 GPM, the emergency storage at the lift station has a peak flow storage capacity of 6.90 hours.

For the Deer Lick Lift Station, all phases (Phases 1 to 5) of the expansion will exceed the pumping capacity of 520 GPM. However, peak flow calculations indicate the pumping capacity is already surpassed under existing conditions. In Phase 5, based on the proposed peak flow of 841.53 GPM, the equalization basin at the lift station has a peak flow storage capacity of 3.24 hours.

For both the conveyance system between the Ahwahnee Lift Station, Deer Lick Lift Station, and RSWD WWTP, the pumps are the limiting factor of flowrate in the wastewater system. The force mains, inverted siphons, and gravity mains at most slopes have higher capacity than the pump capacity.

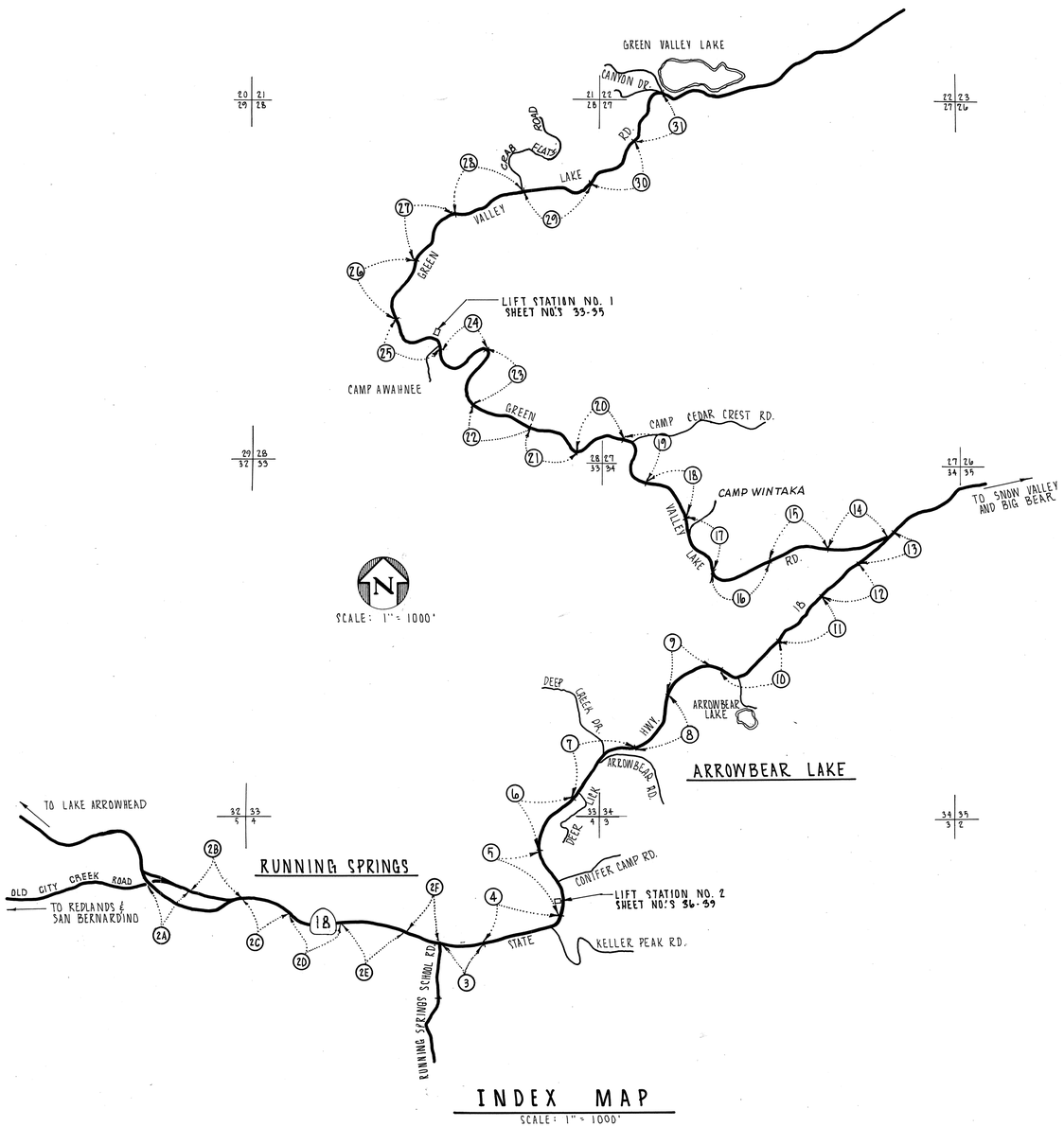
The RSWD WWTP has a capacity of 1.0 MGD in the winter and 0.5 MGD in the summer months. Existing flows for the RSWD WWTP show that the plant exceeds capacity in May and June. Phase 3 of the expansion of the Camp will cause flows to exceed in May, June, and July. Phase 5 will cause flows to exceed in May, June, July, and August.

Based on these findings, it is recommended that the Camp initiate preliminary design for pump upgrades and storage expansion at both lift stations, and coordinate with RSWD to evaluate near-term and long-term strategies for increasing WWTP seasonal capacity. Concurrently, the downstream gravity sewer system should be evaluated for potential bottlenecks under future lift station conditions. These efforts should be aligned with a phased development plan that matches Camp occupancy growth with the completion of required infrastructure improvements. This study is intended to serve as the technical foundation for those discussions and design coordination between Hume SoCal, RSWD, and Kimley-Horn.

APPENDIX A

Conveyance As-Builts (Green Valley Lake Interceptor, 1974 & 1969 Interceptor Sewers)

GREEN VALLEY LAKE



GENERAL NOTES

1. ALL STATIONING ON THE DRAWINGS ARE ALONG THE TRANSIT LINE UNLESS OTHERWISE SHOWN. THE ACTUAL PIPE LENGTHS BETWEEN STATIONS ARE NOT NECESSARILY THE NUMERIC DIFFERENCE BETWEEN THESE STATIONS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE ACTUAL LENGTH OF PIPE FOR BID PURPOSES.
2. THE CENTERLINE OF STATE HIGHWAY 18 AND GREEN VALLEY LAKE ROAD AS SHOWN ON THE PLANS IS THAT OF THE EXISTING PAVEMENT STRIPING. THE ENGINEER MAY ALLOW VARIATIONS IN THE ALIGNMENT OF THE SEWER AS SHOWN ON THE PLANS DUE TO OBSTRUCTIONS ENCOUNTERED IN EXCAVATION. THE VARIATIONS WILL BE CONSISTANT WITH GOOD DESIGN PRACTICES AND TRAFFIC REQUIREMENTS.
3. IN THE INSTALLATION OF THE SEWER PIPE AT THE VARIOUS VERTICAL AND HORIZONTAL CURVES, THE JOINT DEFLECTIONS SHALL NOT EXCEED THE MAXIMUM AS RECOMMENDED BY THE PIPE MANUFACTURER. SHORT LENGTHS OF PIPE MAY BE REQUIRED IN SOME CASES.
4. ALL PIPE SHALL BE EXTRA STRENGTH V.C.P., PVC - MAX. SDR 35, ABS COMPOSITE, OR DUCTILE IRON UNLESS OTHERWISE NOTED. THE CLASS OF DUCTILE IRON PIPE SHALL BE ACCORDING TO THE SPECIFICATIONS FOR THE DEPTHS LISTED.
5. ALL ELEVATIONS ON THESE PLANS ARE BASED ON U.S.G.S. DATUM.
6. THE PIPE BEDDING SHALL CONFORM TO STD. DWG. E-2 FOR NORMAL BEDDING EXCEPT WHERE THE DEPTH OF THE TRENCH EXCEEDS THE MAX. ALLOWABLE DEPTH AS LISTED BELOW. IN SUCH CASES, SPECIAL BEDDING SHALL BE USED.

* MAXIMUM ALLOWABLE TRENCH DEPTH FOR NORMAL BEDDING

	PIPE SIZE	MAX. TRENCH WIDTH = 2'-9"	MAX. TRENCH WIDTH = 3'-0"
VCP	8"	14'	14'
	10"	16'	12'
PVC	8"-10"	12'	10'

* TRENCH DEPTH IS THE VERTICAL DISTANCE FROM THE GROUND SURFACE TO THE BOTTOM OF THE TRENCH. ABS COMPOSITE OR DUCTILE IRON - NO MAXIMUM DEPTH RESTRICTION.

7. WHERE PVC OR ABS COMPOSITE PIPE IS USED, MANHOLE COUPLINGS SHALL BE USED FOR ALL CONNECTIONS TO MANHOLES.
8. NOTE DELETED
9. △ NOTE DELETED
10. ALL MANHOLE COVERS WITHIN STATE HWY SHALL BE SET 1" BELOW EXISTING PAVEMENT GRADE AND THE TOP SHALL BE PAVED WITH ASPHALT CONCRETE.
11. CONCRETE ENCASEMENT PER SPECIAL DISTRICTS STANDARD DWG. E-2 SHALL BE CONSTRUCTED AROUND SEWER PIPE WHERE THE COVER OVER THE TOP OF THE PIPE IS 2'-0" OR LESS FOR V.C.P. AND 3'-0" OR LESS FOR PVC OR ABS COMPOSITE PIPE
12. CORRUGATED METAL OR REINFORCED CONCRETE PIPE CROSSING OVER THE SEWER TRENCH SHALL BE SUPPORTED IN ACCORDANCE WITH THE SUPPORT DETAIL SHOWN ON SHEET 32. "SEWER UNDERCROSSING"
13. CORRUGATED METAL OR REINFORCED CONCRETE PIPE CROSSING WITHIN 18" UNDER THE SEWER SHALL BE BLANKETED IN ACCORDANCE WITH THE DETAIL SHOWN ON SHEET 32. "SEWER UNDERCROSSING"
14. THE EXISTANCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. NEITHER THE ENGINEER NOR THE COUNTY SERVICE AREA GUARANTEE THE ACCURACY OR COMPLETENESS OF THE LOCATION OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF WORK OF THIS PROJECT. THE CONTRACTOR SHALL LOCATE ALL UTILITY PIPES OR STRUCTURES PRIOR TO COMMENCING WORK IN ANY GIVEN AREA AND SHALL TAKE ALL PRECAUTIONARY MEASURES TO PROTECT ALL OF THE UTILITY PIPES OR STRUCTURES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
15. THE CONTRACTOR IS REQUIRED TO NOTIFY THE EXISTING UTILITY COMPANIES IN THE AREA 72 HOURS PRIOR TO STARTING ANY WORK. THE KNOWN UTILITY COMPANIES IN THE AREA ARE:

WATER: ARROWBEAR PARK COUNTY WATER DISTRICT
32869 HILLTOP BLVD.
ARROWBEAR, CALIFORNIA
PHONE: 867-2704

RUNNING SPRINGS COUNTY WATER DISTRICT
31242 HILLTOP BLVD.
RUNNING SPRINGS, CALIFORNIA
PHONE: 867-2766

GREEN VALLEY MUTUAL WATER COMPANY
33646 HOLCOMB CREEK DR.
GREEN VALLEY LAKE, CALIFORNIA
PHONE: 867-2912

CRESTLINE - LAKE ARROWHEAD WATER AGENCY
24116 CREST FOREST DR.
CRESTLINE CALIFORNIA
PHONE: 338-1779

GAS: SOUTHERN CALIFORNIA GAS COMPANY
P.O. BOX 6226 (570 WEST 4TH STREET)
SAN BERNARDINO, CALIFORNIA
PHONE: 884-9411

ELECTRICITY: SOUTHERN CALIFORNIA EDISON COMPANY
26364 PINE AVE.
RIM FOREST CALIFORNIA
PHONE: 337-2561

TELEPHONE: CONTINENTAL TELEPHONE COMPANY
27790 W. MAIN ST.
BARSTOW CALIFORNIA
PHONE: 256-3511

16. ALL MANHOLES WITHIN COUNTY ROADS SHALL BE RAISED TO ½" BELOW FINISHED GRADE PER STD. DWG. E-4

LIST OF STANDARD DRAWINGS

SPECIAL DISTRICTS DEPARTMENT COUNTY OF SAN BERNARDINO STANDARDS FOR SANITARY SEWERS

DWG. NO.	
E-1	PROTECTION OF UTILITY WATER LINES FROM GRAVITY SEWERS
E-2	PIPE BEDDING
E-3	CONCRETE BLANKET
E-4	PRECAST MANHOLE
E-7	MANHOLE FRAME AND COVER

LEGEND

TOE	EDGE OF PAVEMENT
	TOE OF SLOPE
TOP	TOP OF SLOPE
—G— G—	GAS MAIN
—W— W—	WATER MAIN
—S— S—	SEWER MAIN (EXIST.)
—E— E—	UNDERGROUND ELECTRICAL
—T— T—	UNDERGROUND TELEPHONE
P.P.	POWER POLE
P.P.	POWER POLE WITH GUY WIRE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
RCB	REINFORCED CONCRETE BOX
VALVE	WATER VALVE
F.H.	FIRE HYDRANT
A.C.	ASPHALT CONCRETE

INDEX OF SHEETS

SHEET NUMBERS	DESCRIPTION
1	TITLE SHEET
2	INDEX AND NOTES
2A-13	PLAN AND PROFILE STATE HIGHWAY 18
14-31	PLAN AND PROFILE GREEN VALLEY LAKE ROAD
32	DETAIL SHEET
33-37	LIFT STATION NO. 1 (GREEN VALLEY LAKE ROAD) / LIFT STATION NO. 2 (STATE HIGHWAY 18)
38	DELETED
39,40	LIFT STATION NO. 2 (STATE HIGHWAY 18)
41	DELETED
42,43	LIFT STATIONS NO. 1 & 2 ELECTRICAL
44	DELETED
45	LIFT STATIONS NO. 1 & 2 ARCHITECTURAL
46	DELETED
47-48	LIFT STATIONS NO. 1 & 2 ARCHITECTURAL

REV	DATE	BY	DESCRIPTION
△	7/19	H.N.	GENERAL NOTE 9.
△	9/24/74		GENERAL REVISIONS TO GENERAL NOTES

SCALE: AS SHOWN

DESIGNED A.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS 353 WEST SIXTH STREET, SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Richard S. Titera — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

APPROVED Cally M. Powell — DATE 5-21-74

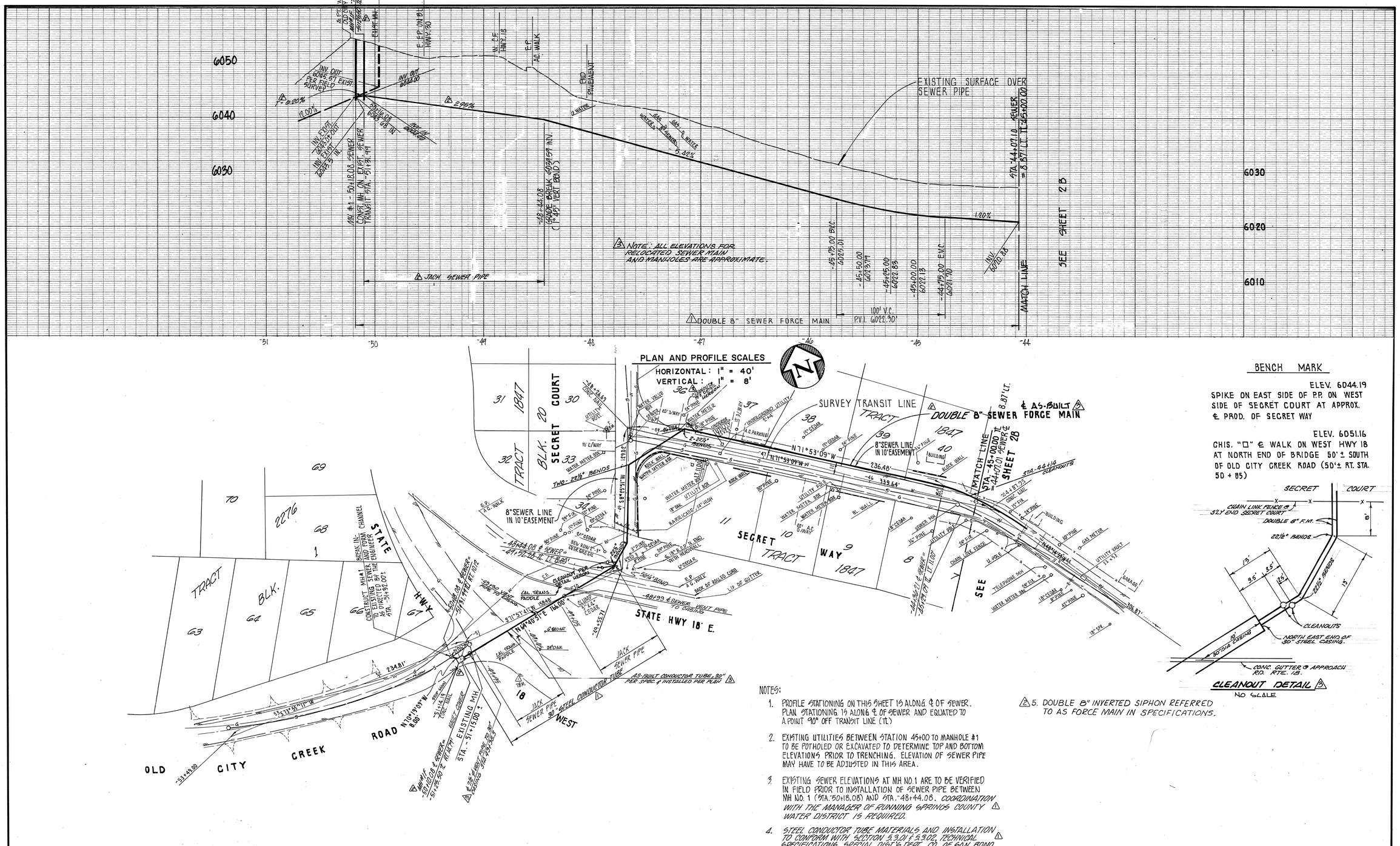
APPROVED Albert R. Reid — DATE 5-21-74

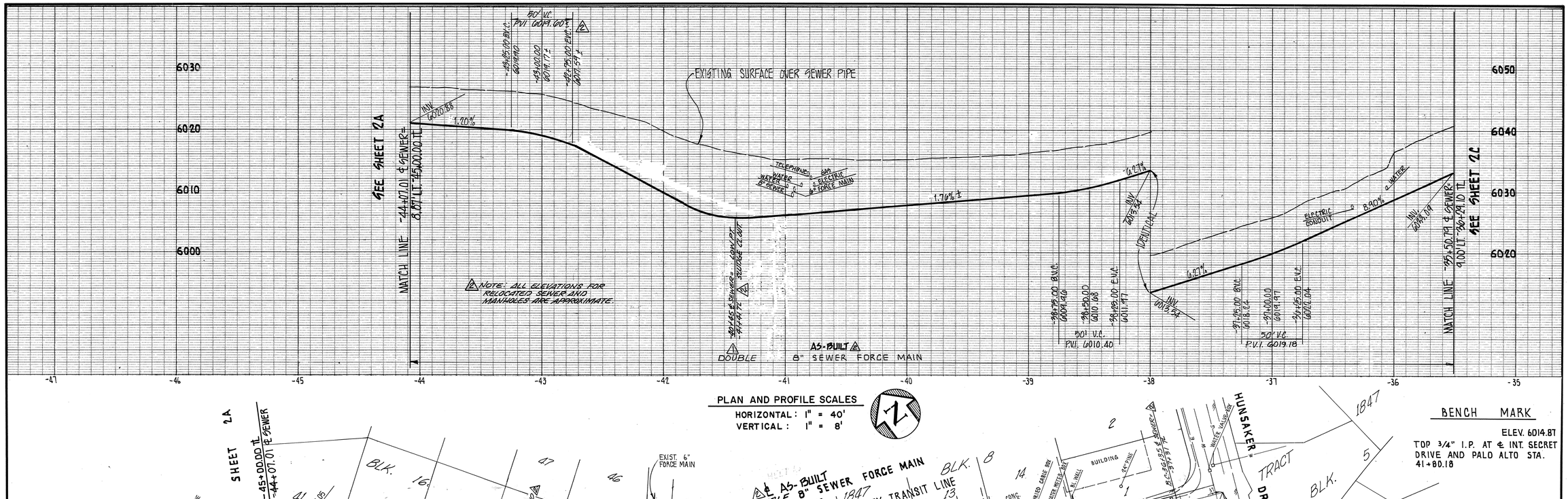
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

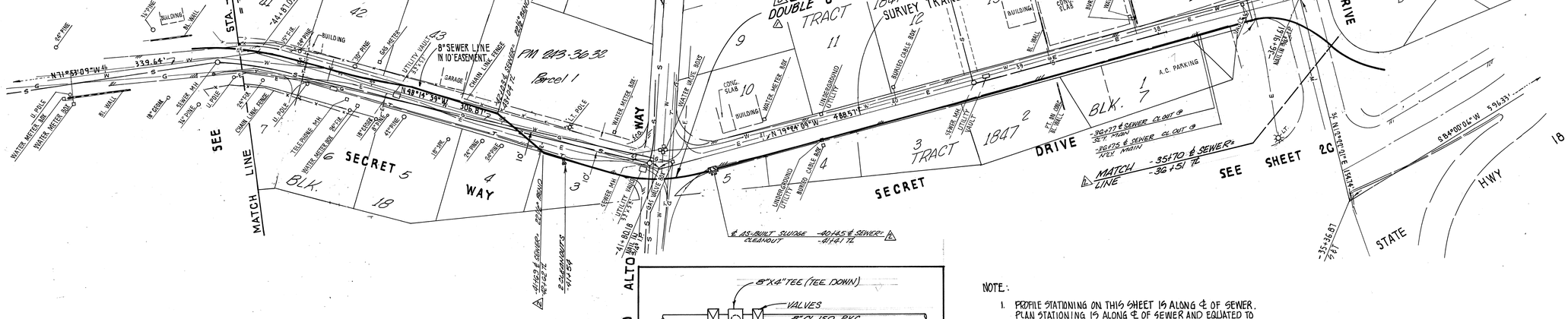
INTERCEPTOR

INDEX AND NOTE SHEET

SHEET 2 OF 48

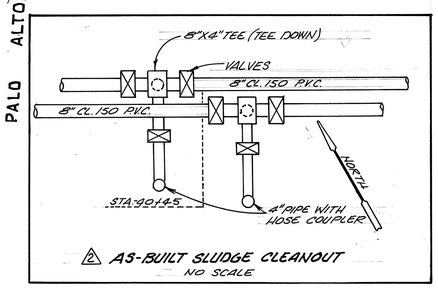

6050
6040
6030
6020
6010
-51
-50
-49
-48
-47
-46
-45
-44
EXISTING SURFACE OVER SEWER PIPE
SEE SHEET 2B
MATCH LINE
INV. OUT 6044.00
INV. IN 6039.00
INV. EXIST. 24" RCP 6043.5± IN.
INV. EXIST. 24" RCP 6043.5± OUT.
CONSTR. MH #1 - 50+18.08 SEWER
CONST. MH ON EXIST. SEWER
TRANSIT STA. -51+91.99
-48+44.08 GRADE BREAK 6039.59 INV. (TIE 1.951' VERT. BOLT)
-45+75.00 B.V.C. 6025.01
-45+50.00 6023.74
-45+95.00 6022.83
-45+00.00 6022.18
-44+75.00 E.V.C. 6021.90
INV. 6020.86
STA. 44+07.10 SEWER = 8.87' LT. TT 45+00.00
JACK SEWER PIPE
DOUBLE 8" SEWER FORCE MAIN
100' V.C. P.V.I. 6022.30
10.00%
2.96%
1.20%
E.P. AC. WALK
CUL PAVEMENT
N. P.F. HWY. 18
E. E.P. ON 18
HWY. 90
ELEV. 6044.19
EXISTING SURFACE OVER SEWER PIPE
SEE SHEET 2B
MATCH LINE
STA. 45+00.00 = 44+07.01 SEWER
8.87' LT.
DOUBLE 8" SEWER FORCE MAIN
SURVEY TRANSIT LINE
TRACT
1847
SECRET COURT
BLK. 30
TRACT 1847
SECRET WAY
STATE HWY 18 E.
OLD CITY CREEK ROAD N 71° 53' 09" W 800'
8" SEWER LINE IN 10' EASEMENT
N 71°53'09" W
236.48'
339.64'
STA. 44+71.25
STA. 44+14 CLEANOUTS
CONSTRUCT MH #1 #1 CONSTRUCTING SEWER AND ITEMS TO BE INSPECTED BY THE ENGINEER AT STA. 51+92.00±
EXISTING MH
STA. -51+15.00 ±
JACK SEWER PIPE
30" STEEL CONDUCTOR TUBE
AS-BUILT CONDUCTOR TUBE 30" PER SPECS. & INSTALLED PER PLAN
WEST
NORTH
SOUTH
EAST
SEE SHEET 2B
-33+49.00
-50+18.08 ℄ SEWER
-51+15.00 ℄ MANHOLE (BUILT ONCE)
-51+91.99 ℄ MANHOLE (BUILT ONCE)
-51+92.00 ℄ SEWER ENDING STA. 52+03.5
-48+44.08 ℄ SEWER
-48+72.49 ℄ LT. 8.00'
-48+99 ℄ SEWER TO CASING
-48+72.49 ℄ SEWER
-49+27.09 ℄ LT. 11.00'
-49+20 ± ℄ SEWER
-49+40 ± ℄ SEWER
-49+84 ℄ SEWER
-49+40.84 ℄ SEWER
-49+84.08 ℄ SEWER
-49+84.08 ℄ SEWER
-49+84.08





PLAN AND PROFILE SCALES
HORIZONTAL: 1" = 40'
VERTICAL: 1" = 8'

BENCH MARK
ELEV. 6014.87
TOP 3/4" I.P. AT ℄ INT. SECRET DRIVE AND PALO ALTO STA. 41+80.18



△2 AS-BUILT SLUDGE CLEANOUT
NO SCALE

NOTE:

1. PROFILE STATIONING ON THIS SHEET IS ALONG ℄ OF SEWER. PLAN STATIONING IS ALONG ℄ OF SEWER AND EQUATED TO A POINT 90° OFF TRANSIT LINE.
2. EXIST. UTILITIES IN PALO ALTO ARE TO BE POT HOLED OR EXCAVATED TO DETERMINE TOP AND BOTTOM ELEVATIONS PRIOR TO ANY TRENCHING BETWEEN STATIONS (-) 43+00 TO (-) 38+50. ELEVATION OF SEWER PIPE MAY HAVE TO BE ADJUSTED IN THIS AREA
3. △1 DOUBLE 8" INVERTED SIPHON REFERRED TO AS FORCE MAIN IN SPECIFICATIONS.
4. △2 ALL STATION EQUATIONS FOR AS BUILT SEWER ARE APPROXIMATE.

REV	DATE	BY	DESCRIPTION
△1	8/16	H.N.	REMOVED SLUDGE CLEANOUT DETAIL. ADDED CLEANOUT ADDED NOTE 3 ADDED (ONE TRENCH ONLY DOUBLE 8" W/O 8" FORCEMAIN
△2	2/18	D.H.	PLOT AS-BUILT ALIGNMENT PLAN & PROFILE FROM -45+00 TO -36+51

SCALE: AS SHOWN

DESIGNED M.R. GORES
DRAWN M.R. GORES
CHECKED G.W. ATKINS

vtn ENGINEERS ARCHITECTS PLANNERS AVE., SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — 19466 R.E. NO. — 4-1-75 DATE

RECOMMENDED Kirkland S. Jones PROJECT MANAGER — 8625 R.E. NO. — 4-10-75 DATE

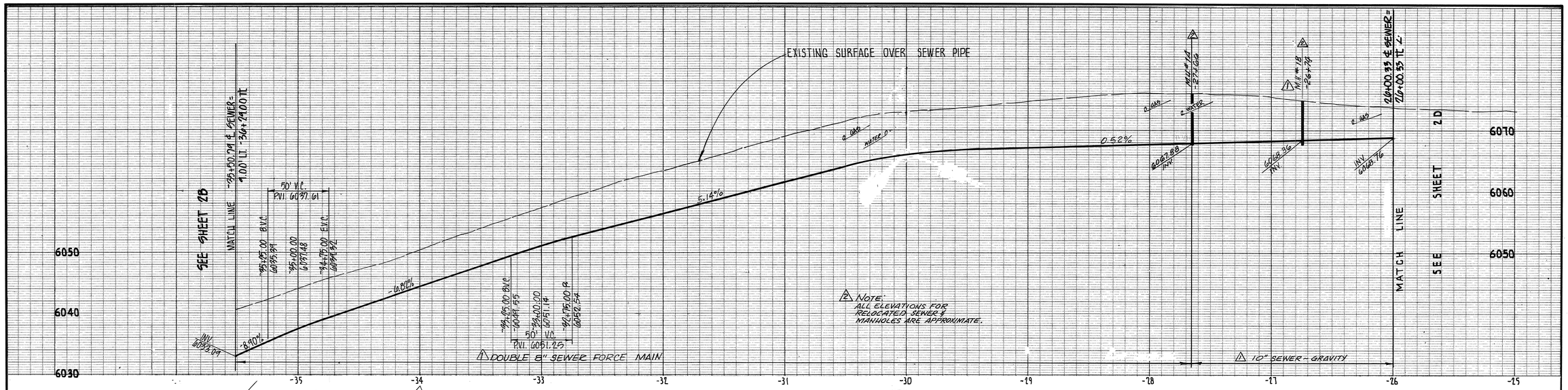
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Teddy McDonald — DATE 4-10-75

APPROVED Albert L. Reed — DATE 4-10-75

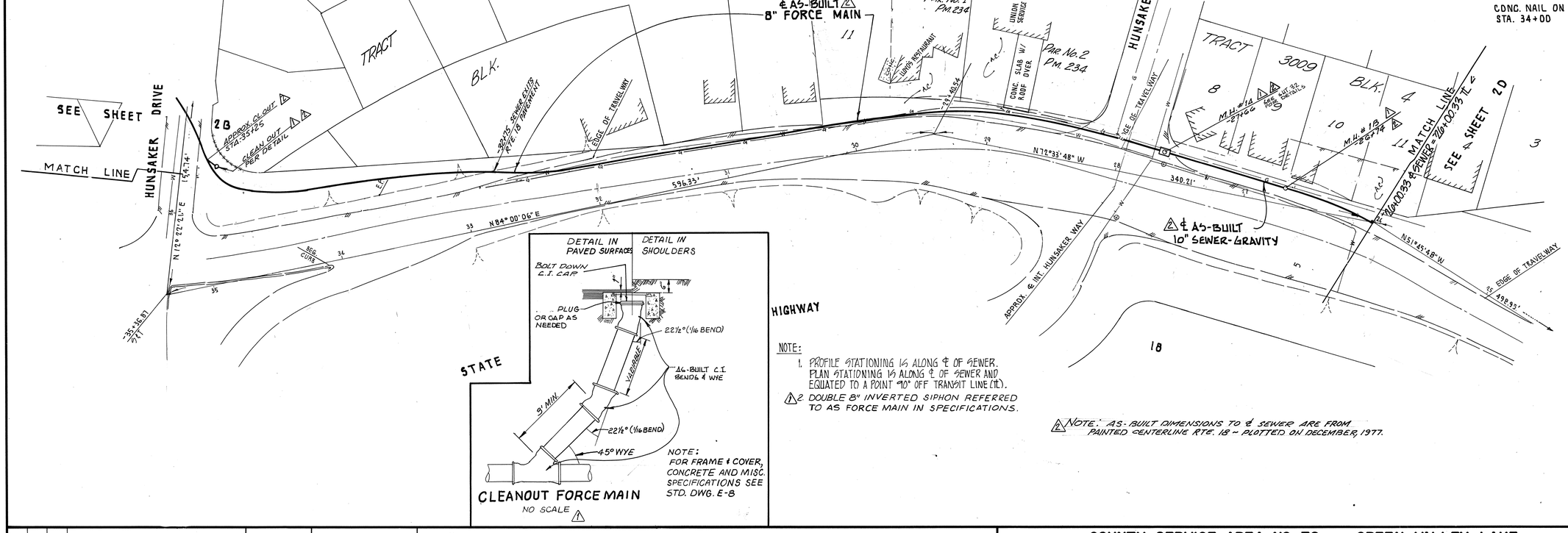
INTERCEPTOR
PLAN AND PROFILE
SECRET WAY
300' W/O PALO ALTO WAY to HUNSAKER DRIVE

SHEET 2B OF 48



PLAN AND PROFILE SCALES
HORIZONTAL : 1" = 40'
VERTICAL : 1" = 8'

BENCH MARK
ELEV. 6074.28
S&T TRANSIT LINE ANGLE POINT
STA. 29+40.54
ELEV. 6050.25
CONC. NAIL ON TRANSIT LINE
STA. 34+00



NOTE:
1. PROFILE STATIONING IS ALONG ℄ OF SEWER. PLAN STATIONING IS ALONG ℄ OF SEWER AND EQUATED TO A POINT 90° OFF TRANSIT LINE (TL).
2. DOUBLE 8" INVERTED SIPHON REFERRED TO AS FORCE MAIN IN SPECIFICATIONS.

NOTE: AS-BUILT DIMENSIONS TO ℄ SEWER ARE FROM PAINTED CENTERLINE RTE. 18 - PLOTTED ON DECEMBER, 1977.

REV	DATE	BY	DESCRIPTION
1	8/76	HN	ADDED MH # 18 & 18 ADDED CLEANOUT & DETAIL ADDED NOTE 2. REVISED PROFILE 10" SEWER WAS 8" FORCE MAIN DOUBLE 8" WAS 8"
2	2/78	D.H.	PLOT AS-BUILT ALIGNMENT IN PLAN & PROFILE FROM HUNSAKER DR. TO -26+00

SCALE: AS SHOWN
DESIGNED M. R. GORES
DRAWN M. R. GORES
CHECKED G.W. ATKINS

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

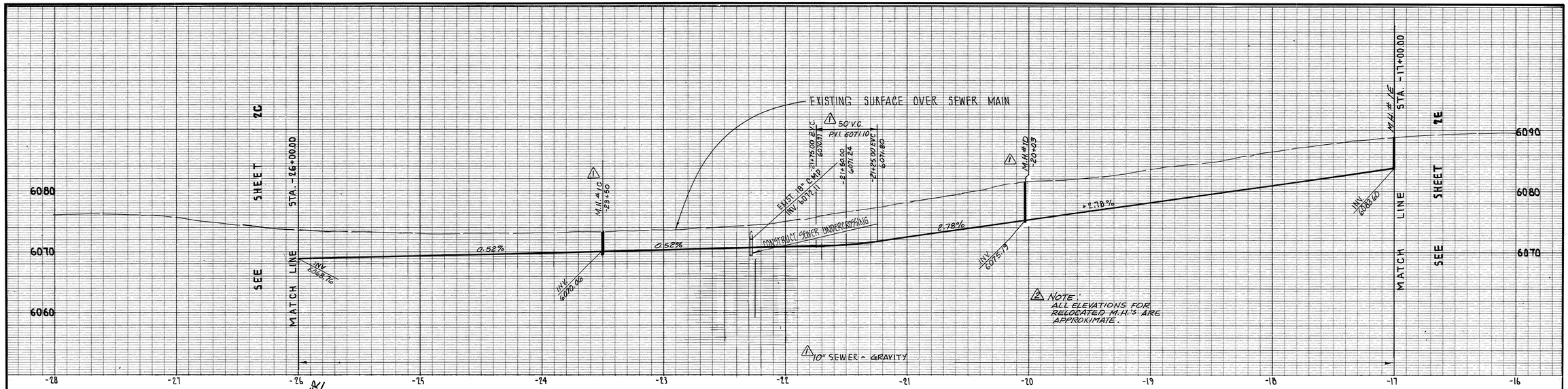
SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-75
RECOMMENDED Richard S. Ittner — PROJECT MANAGER — R.E. NO. 8005 — DATE 4-10-75

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Cathy McConnell — DATE 4-10-75
APPROVED Albert R. Pond — DATE 4-10-75

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
HUNSAKER DRIVE to STA. (-) 26+00

SHEET 2C OF 48

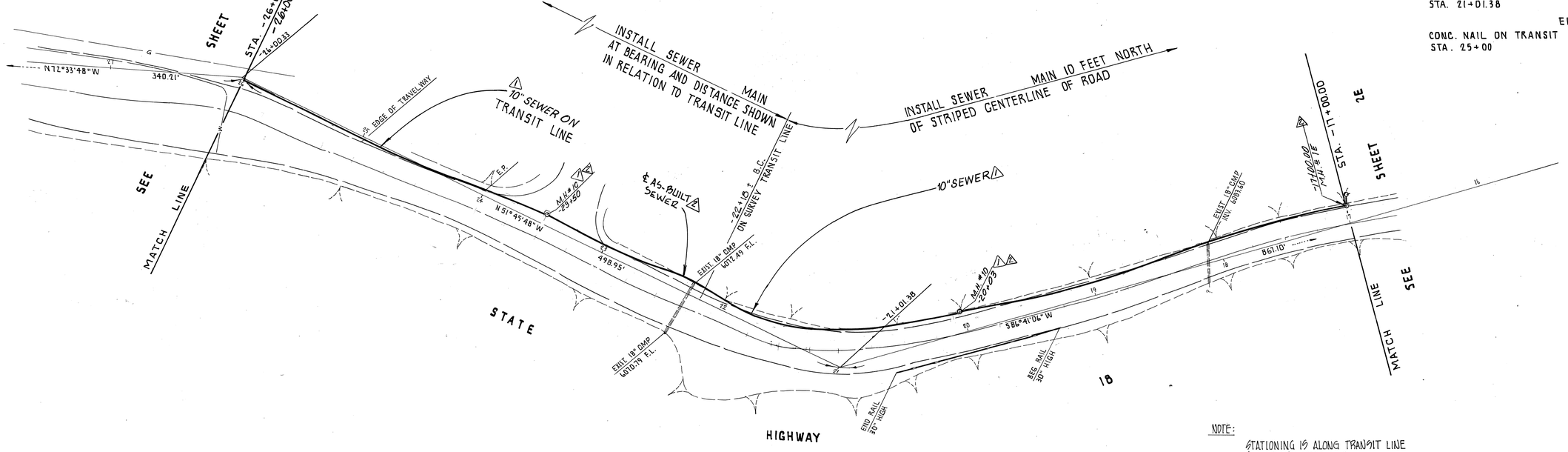


PLAN AND PROFILE SCALES
HORIZONTAL : 1" = 40'
VERTICAL : 1" = 8'

BENCH MARK

ELEV. 6079.51
S & T TRANSIT LINE ANGLE POINT
STA. 21+01.38

ELEV. 6072.66
CONC. NAIL ON TRANSIT LINE
STA. 25+00



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	REVISED PROFILE; ADDED M.H.#16 & 10" SEWER WAS 8" FORCE MAIN
2	1/78	D.H.	PLOT AS-BUILT SEWER ALIGNMENT & ADJUST M.H. ELEVATIONS FROM -26+00 TO -17+00 PLANE PROFILE

SCALE: AS SHOWN

DESIGNED M. R. GORES
DRAWN M. R. GORES
CHECKED G.W. ATKINS

VTN ENGINEERS ARCHITECTS PLANNERS , CALIFORNIA 92401 PHONE (714) 889-4431

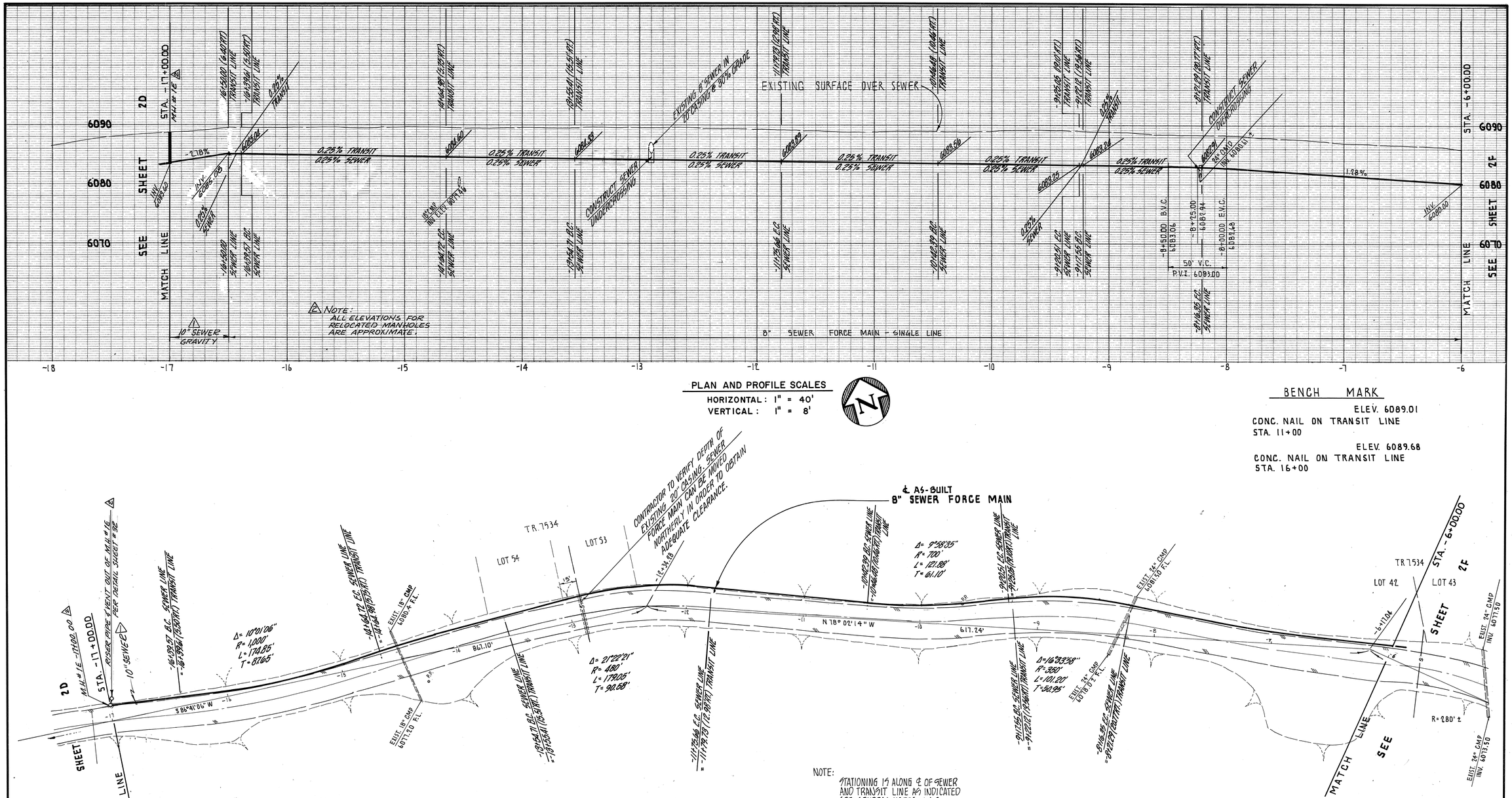
SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19166 — DATE 4-1-75
RECOMMENDED Richard S. Ibsen — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-10-75

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Cathy McDonald — DATE 4-10-75
APPROVED Albert A. Webb — DATE 4-10-75

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
STA. (-) 26+00 to STA. (-) 17+00

SHEET 2D OF 48



PLAN AND PROFILE SCALES
HORIZONTAL: 1" = 40'
VERTICAL: 1" = 8'

BENCH MARK

ELEV. 6089.01
CONC. NAIL ON TRANSIT LINE
STA. 11+00

ELEV. 6089.68
CONC. NAIL ON TRANSIT LINE
STA. 16+00

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Added 10" Sewer from sta -17+00 to sta -16+50.
2	1/78	D.H.	Plot As-Built Alignment in Plan & Profile from -17+00 to -6+00

SCALE: AS SHOWN

DESIGNED M. R. GORES
DRAWN M. R. GORES
CHECKED G. W. ATKINS

vtn ENGINEERS ARCHITECTS PLANNERS — SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19160 — DATE 4-1-75

RECOMMENDED Richard S. Iten — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-10-75

APPROVED Ashley McDonald — DATE 4-10-75

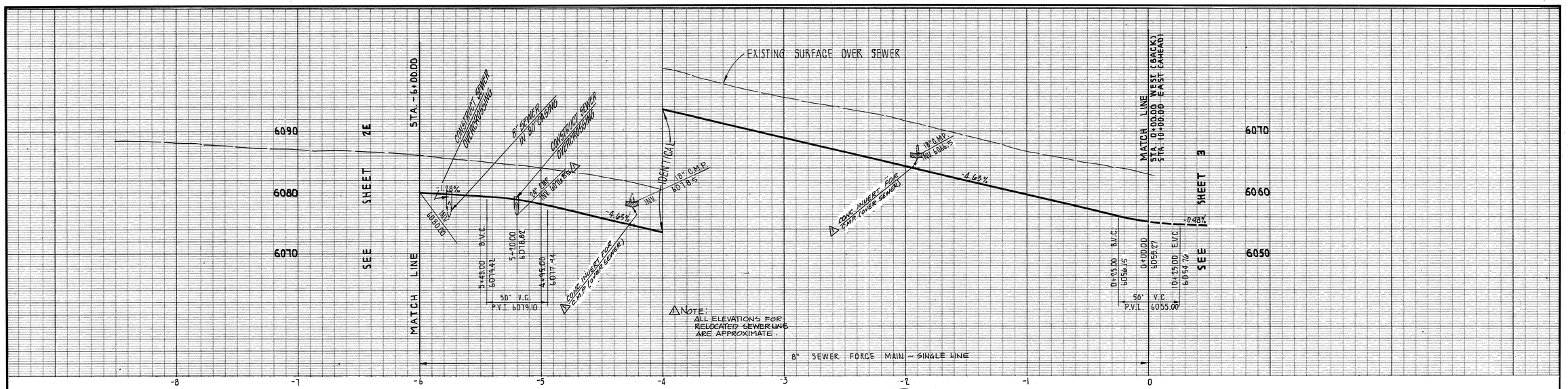
APPROVED Elbert R. Reed — DATE 4-10-75

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

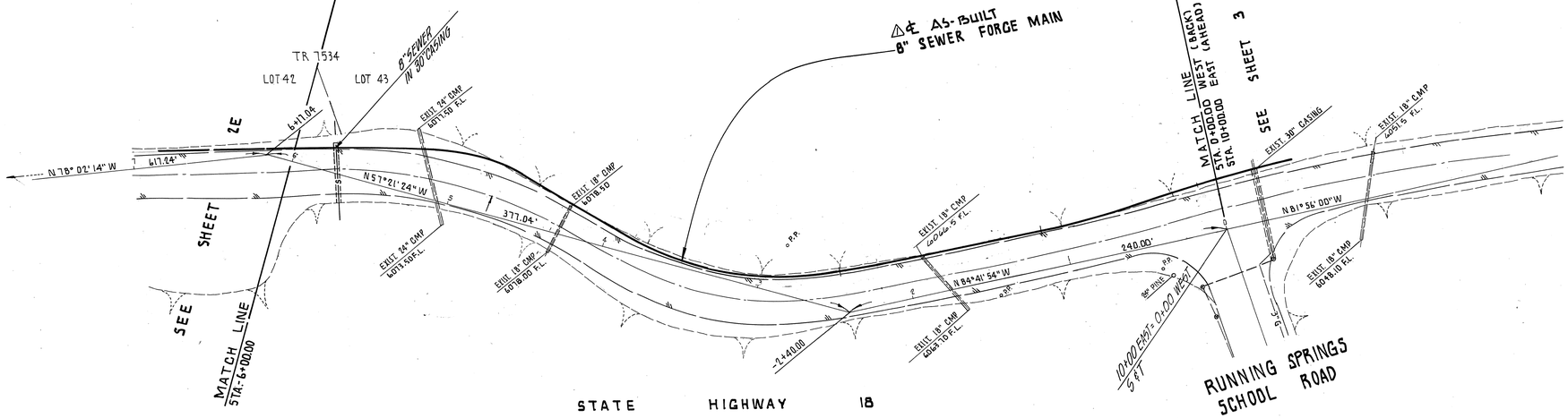
PLAN AND PROFILE
STATE HIGHWAY 18
STA. (-)17+00 to STA. (-) 6+00

SHEET 2E OF 48



PLAN AND PROFILE SCALES
HORIZONTAL: 1" = 40'
VERTICAL: 1" = 8'

BENCH MARK
ELEV. 6063.16
S & T AT TRANSIT LINE ANGLE POINT
STA. 10+00 EAST = 0+00 WEST



△4 AS-BUILT
8" SEWER FORCE MAIN

NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES NO. 1 & 2

REV	DATE	BY	DESCRIPTION
△1	1-78	DH	PLOT AS-BUILT ALIGNMENT IN PLAN & PROFILE FROM -6+00 TO 0+00.

SCALE: AS SHOWN

DESIGNED M. R. GORES
DRAWN M. R. GORES
CHECKED G.W. ATKINS

vtn ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-75

RECOMMENDED Richard S. Stern PROJECT MANAGER — R.E. NO. 8605 — DATE 4-10-75

APPROVED Ashley McPowell — DATE 4-10-75

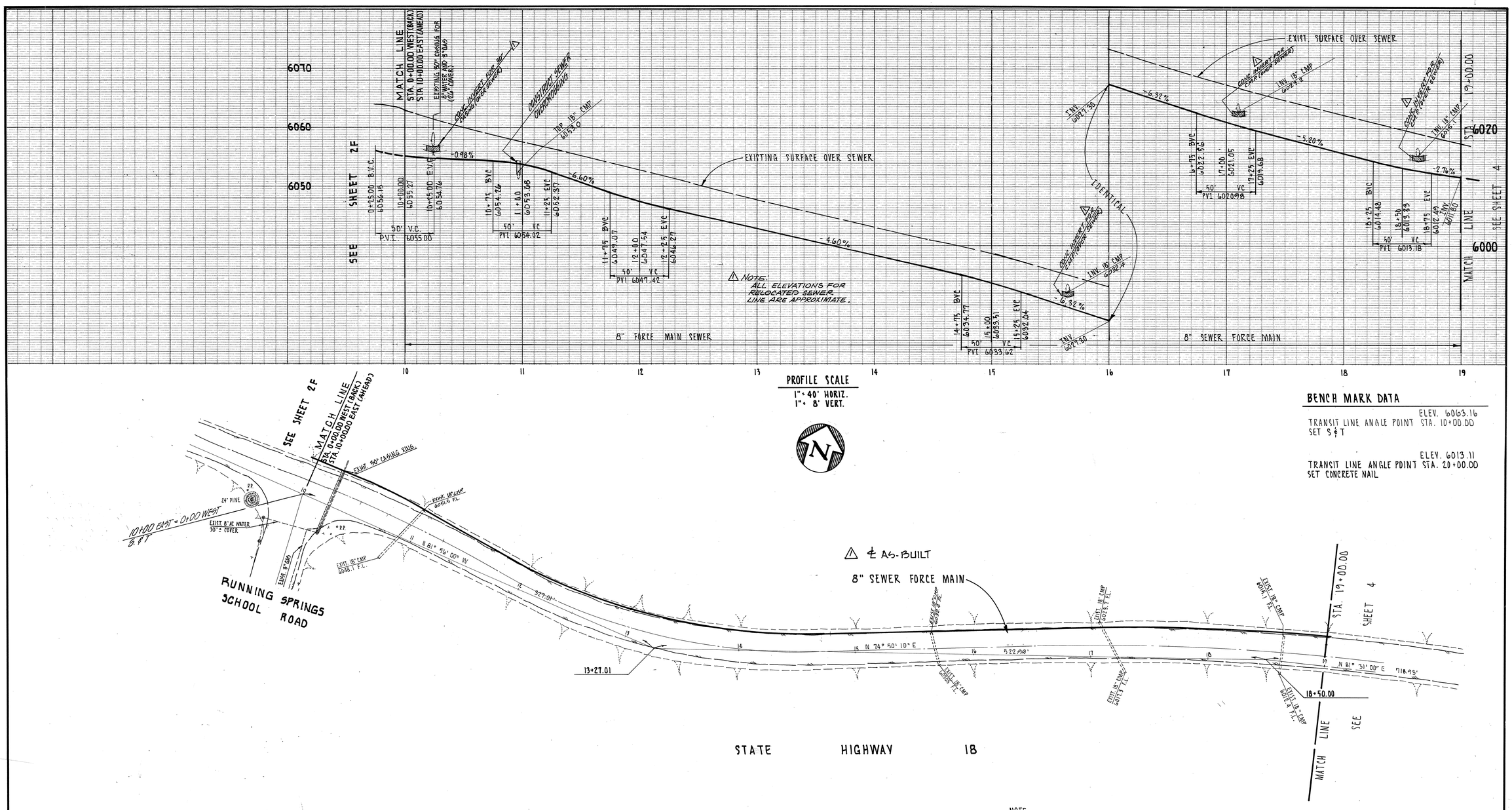
APPROVED Albert R. Reed — DATE 4-10-75

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

PLAN AND PROFILE
STATE HIGHWAY 18
STA. (—) 6+00 to RUNNING SPRINGS SCHOOL ROAD

SHEET 2F OF 48



PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

ELEV. 6063.16
TRANSIT LINE ANGLE POINT STA. 10+00.00
SET S & T

ELEV. 6013.11
TRANSIT LINE ANGLE POINT STA. 20+00.00
SET CONCRETE NAIL

NOTE: STATIONING IS ALONG TRANSIT LINE.
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
△	7-30-74	D.H.	PLOT AS-BUILT SEWER ALIGNMENT PLAN & PROFILE FROM 10+00 TO 13+00

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE
RECOMMENDED Richard S. Titus — PROJECT MANAGER — 8603 R.E. NO. — 4-1-74 DATE

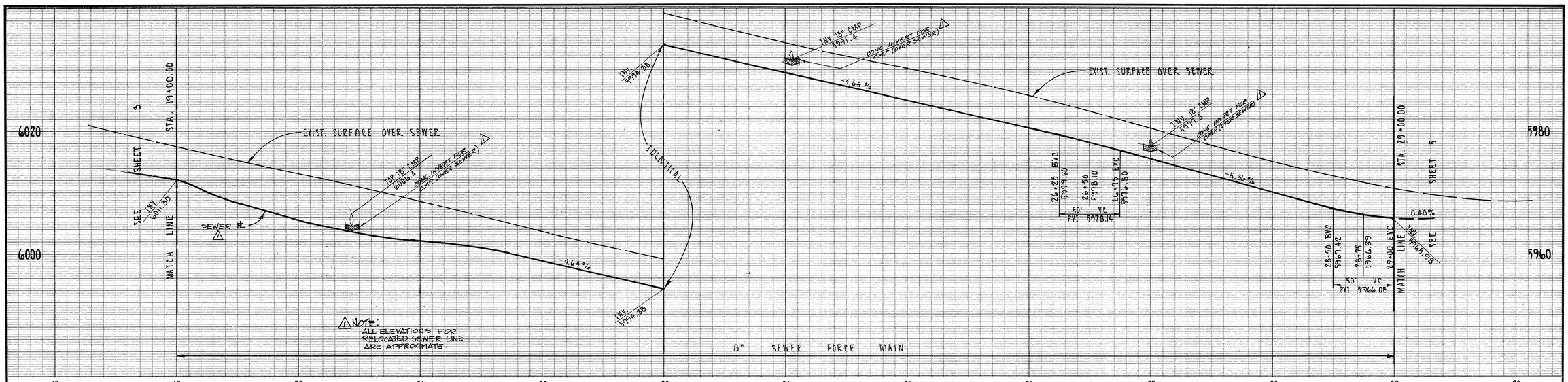
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy McBroom — DATE 5-21-74
APPROVED Albert K. Reed — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
RUNNING SPRINGS SCHOOL ROAD to STA. 19+00

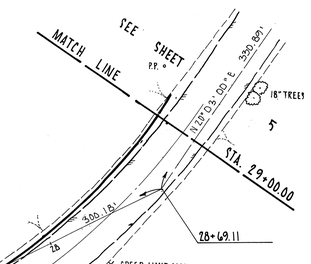
SHEET 3 OF 48

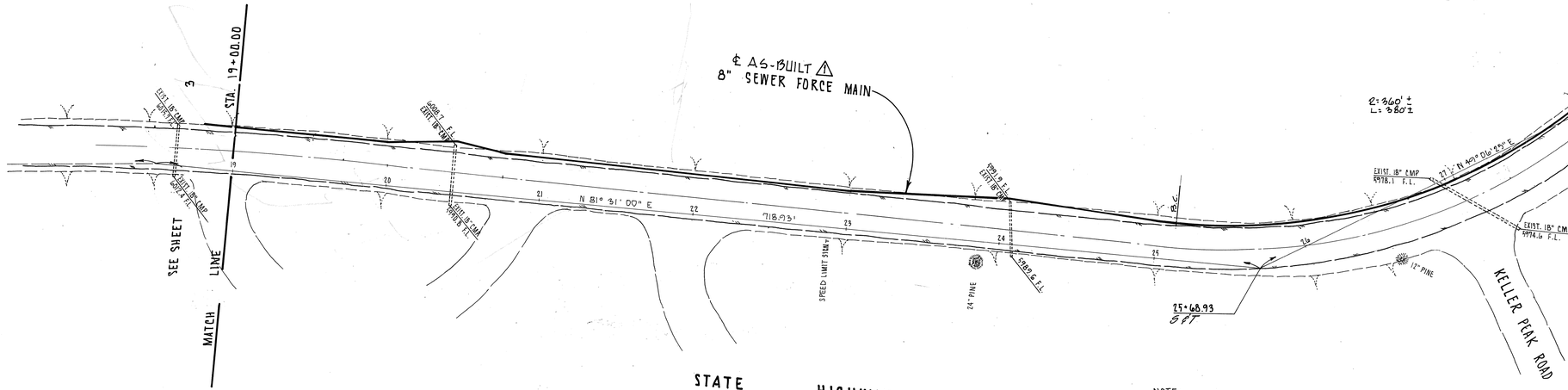
711-07



⚠ NOTE:
ALL ELEVATIONS FOR RELOCATED SEWER LINE ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.





PLAN SCALE
1" = 40'

NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

BENCH MARK DATA

ELEV. 6013.11
TRANSIT LINE ..... STATION
20+00.00 SET CONC. NAIL

ELEV. 5987.45
TRANSIT LINE ANGLE POINT STA. 25+68.93
SET S & T

REV	DATE	BY	DESCRIPTION
⚠	1/78	D.H.	PLOT AS-BUILT ALIGNMENT 19+00 TO 29+00 IN PLAN & PROFILE

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

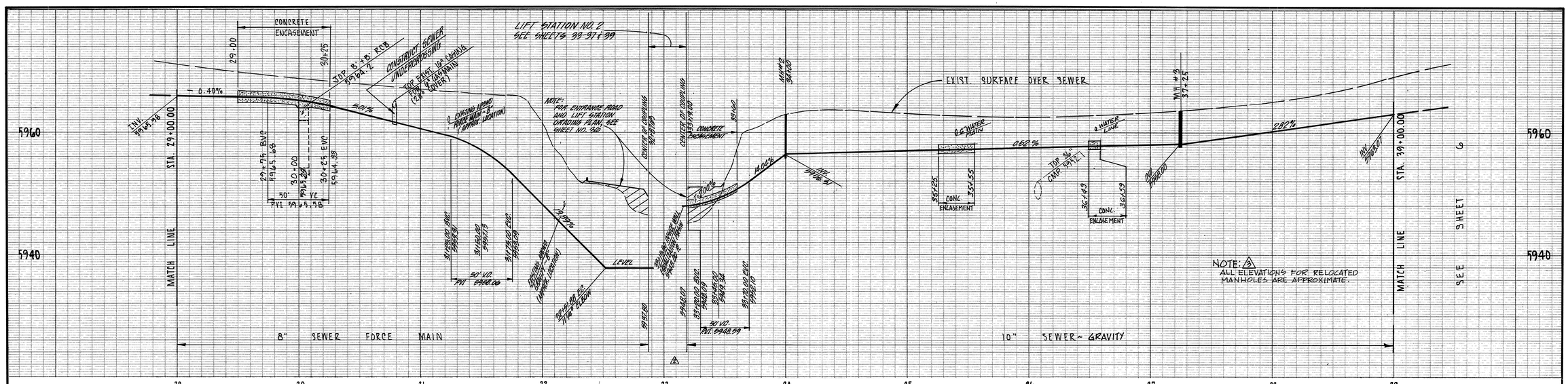
SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74
RECOMMENDED Richard S. Ittner — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy M Bonnell — DATE 5-21-74
APPROVED Albert A Reed — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 19+00 to STA. 29+00

SHEET 4 OF 48

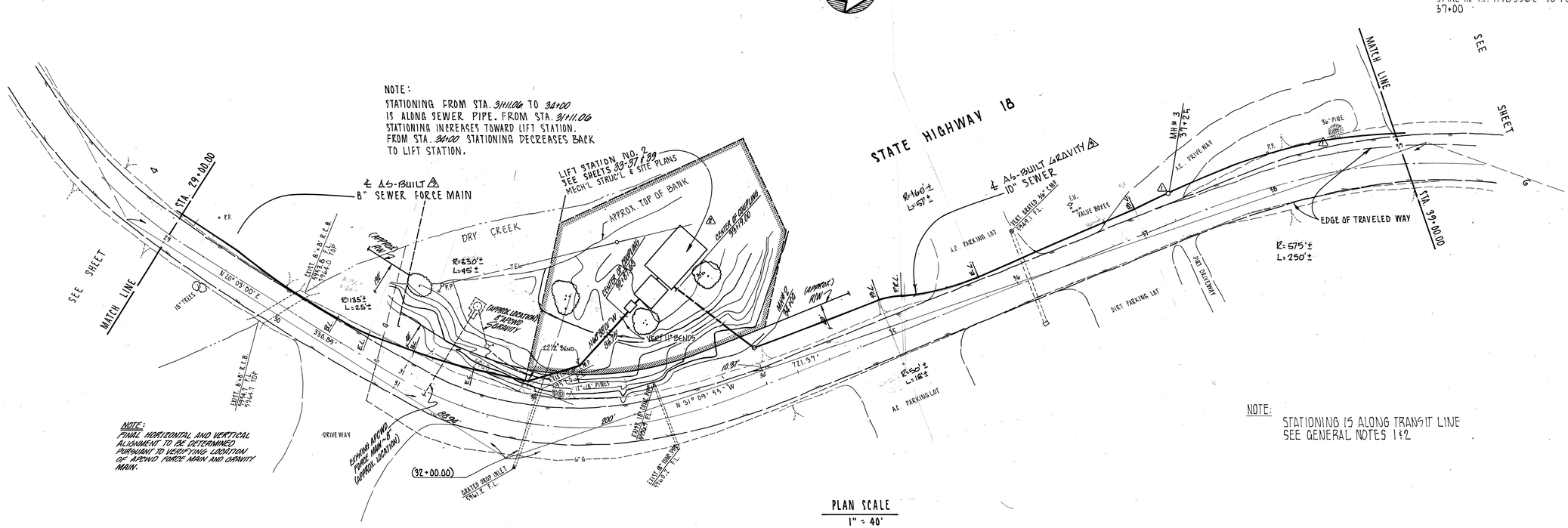


PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

ELEV. 5969.61
TRANSIT LINE ANGLE POINT STA. 39+21.37
SET S & T

ELEV. 5964.63
SPIKE IN P.P. 1178336E 50 FEET LEFT STA. 37+00



PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
△	8/70	H.N.	Revise profile between Lift Sta 2 & Sta 39+00. Delete 8" stubs @ MH's 2 & 3. Delete MH 9A.
△	9/70	H.N.	Lift Sta site Plan, Profile & appurtenances
△	1/18	D.H.	PLOT AS-BUILT ALIGNMENT 29+00 TO 39+00

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

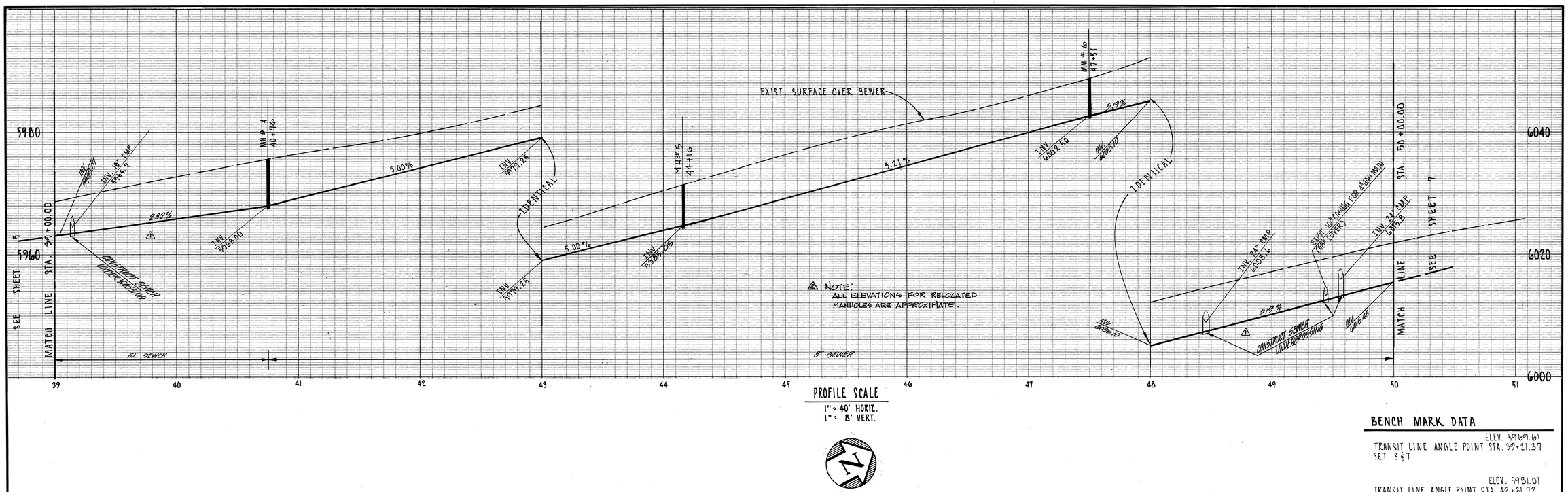
SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74
RECOMMENDED Richard S. Titera — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy M. Powell — DATE 5-21-74
APPROVED Albert R. Reid — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 29+00 to STA. 39+00

SHEET 5 OF 48



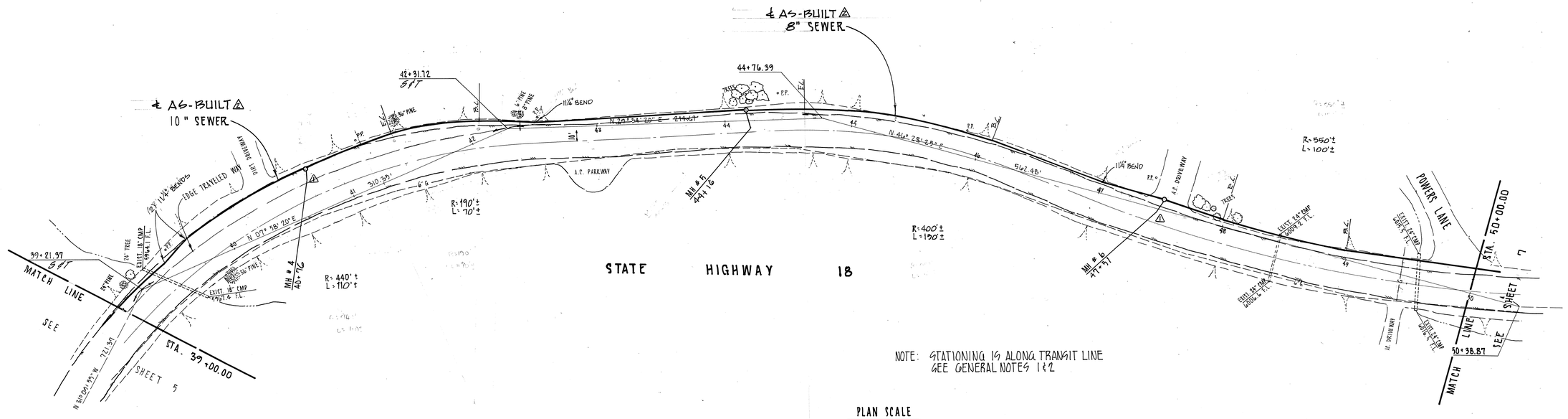
⚠ NOTE:
ALL ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

ELEV. 5969.61
TRANSIT LINE ANGLE POINT STA. 39+21.37
SET S&T

ELEV. 5981.01
TRANSIT LINE ANGLE POINT STA. 42+31.72
SET S&T



NOTE: STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
⚠	8/76	H.N.	Revise profile between sta 39+00 & MH # also MH.
⚠			& sta. 50+00. Delete Estimated MH's 4, 5 & 6.
⚠	1/78	C.W.	Plot As-Built alignment 39+00 to 50+00

SCALE: AS SHOWN

DESIGNED G. W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 . PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Roland S. Ittner PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

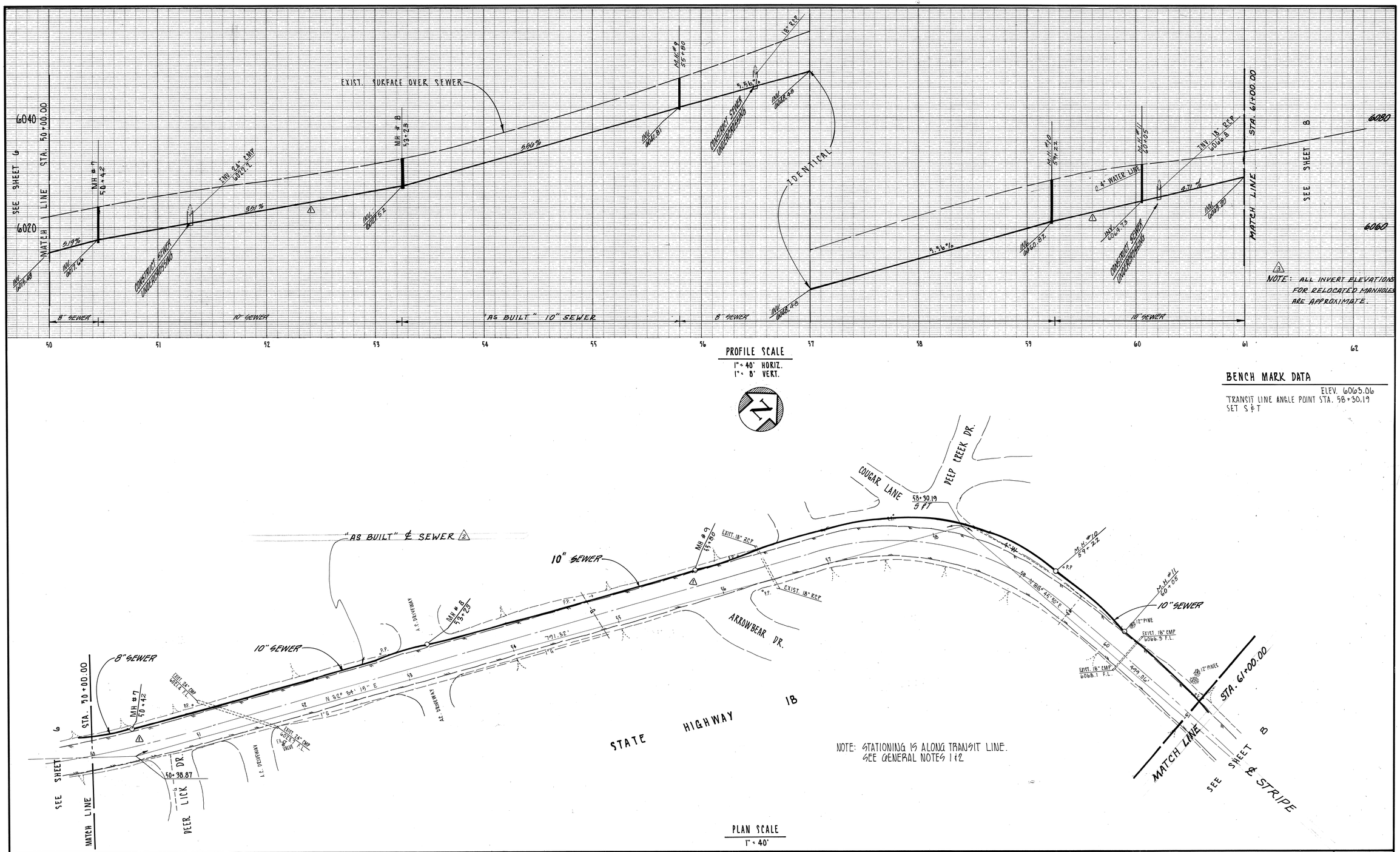
APPROVED Sally McDonnell — DATE 5-21-74

APPROVED Albert A. Reid — DATE 5-21-74

INTERCEPTOR

PLAN AND PROFILE
STATE HIGHWAY 18
STA. 39+00 to STA. 50+00

SHEET 6 OF 48



NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

ELEV. 6060.06
TRANSIT LINE ANGLE POINT STA. 58+30.19
SET S & T

NOTE: STATIONING IS ALONG TRANSIT LINE.
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Revise profile between sta 50+00 & MH.9 also MH.10
			& MH. 11. Delete 8" stubs @ M.H.'s 7 & 9.
2	1/78	HH	PLAN - "AS BUILT" ALIGNMENT PLOTTED SEE SHEET
			TO STA. 61+00
3	1/78	HH	PROFILE - "AS BUILT" LOCATION OF M.H. 7, 8, 9, 10, 11
			& ADDED NOTE

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED DR. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Titus — PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

APPROVED Addy M. Powell — DATE 5-21-74

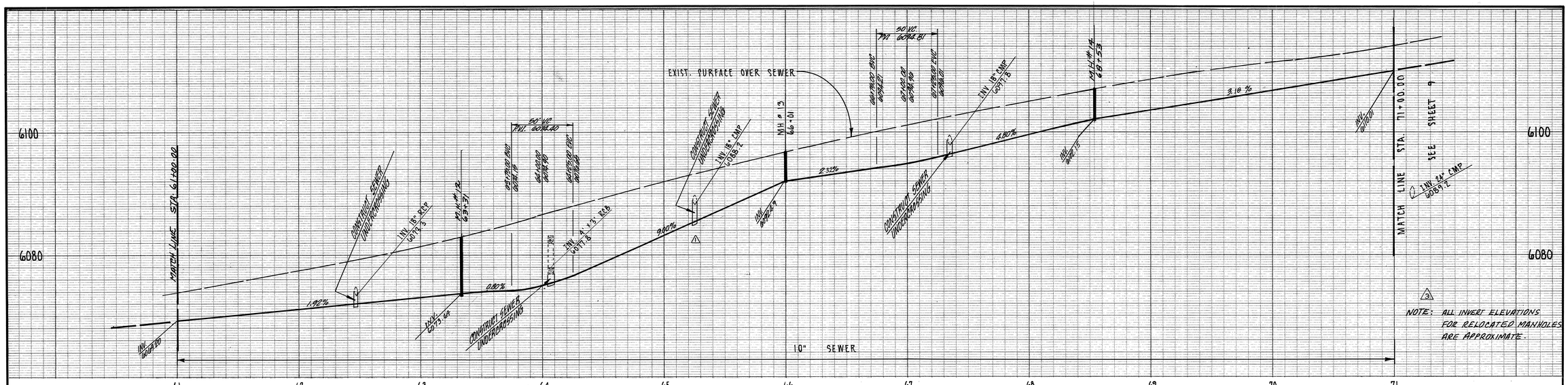
APPROVED Albert R. Reid — DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

PLAN AND PROFILE
STATE HIGHWAY 18
STA. 50+00 to STA. 61+00

SHEET 7 OF 48

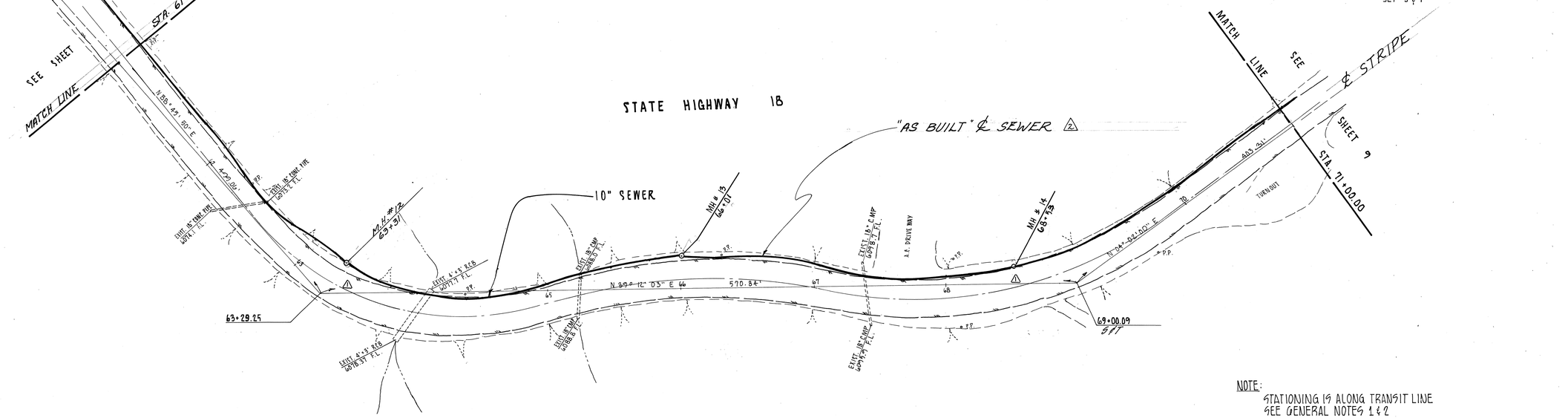


PROFILE SCALE
1"= 40' HORIZ.
1"= 8' VERT.

BENCH MARK DATA

USC & GS BM NO. 296-1935 ELEV. 6087.36
STA. 64+10 47 FEET RIGHT, IN THE SW SIDE OF THE BASE OF A LARGE ROCK OUTCROP. STANDARD DISK STAMPED " R 296-1935 "

ELEV. 6109.75
TRANSIT LINE ANGLE POINT STA. 69+00.09
SET S & T



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1"= 40'

REV	DATE	BY	DESCRIPTION
1	8/78	H.N.	Revise profile between MH 11 & 66 71+00. Delete 8" stubs @ MH 13, 12 & 14.
2	11-78	HH	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA & NOTE TO STA. 71+00.
3	11-78	HH	PROFILE - "AS BUILT" LOCATION OF M.H. 11, 12, 13 & 14 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — 10A66 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Stites PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

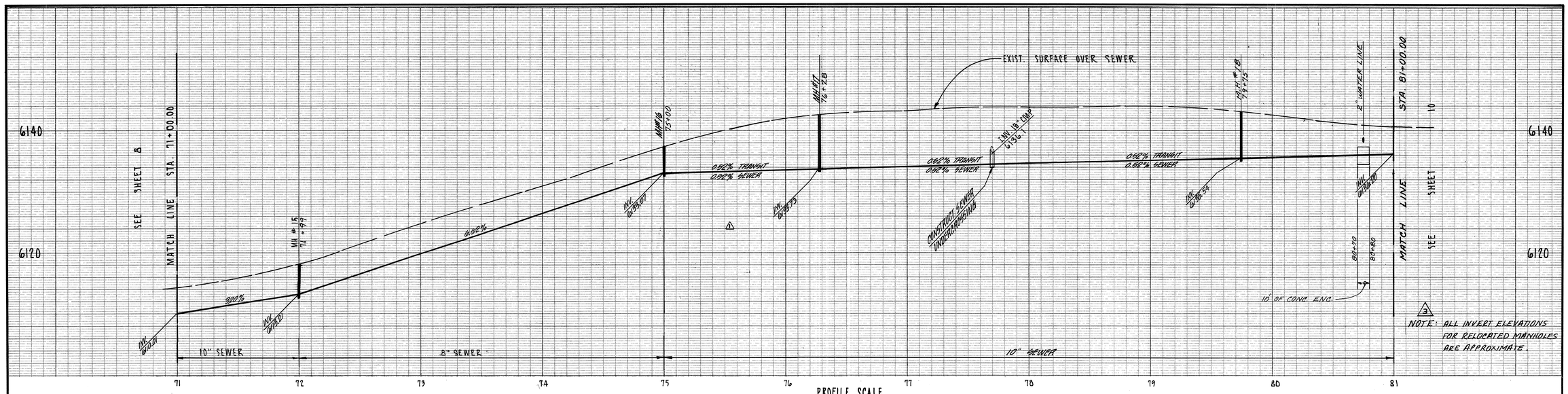
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy McDowell — DATE 5-21-74

APPROVED A R Reed — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 61+00 to STA. 71+00

SHEET 8 OF 48



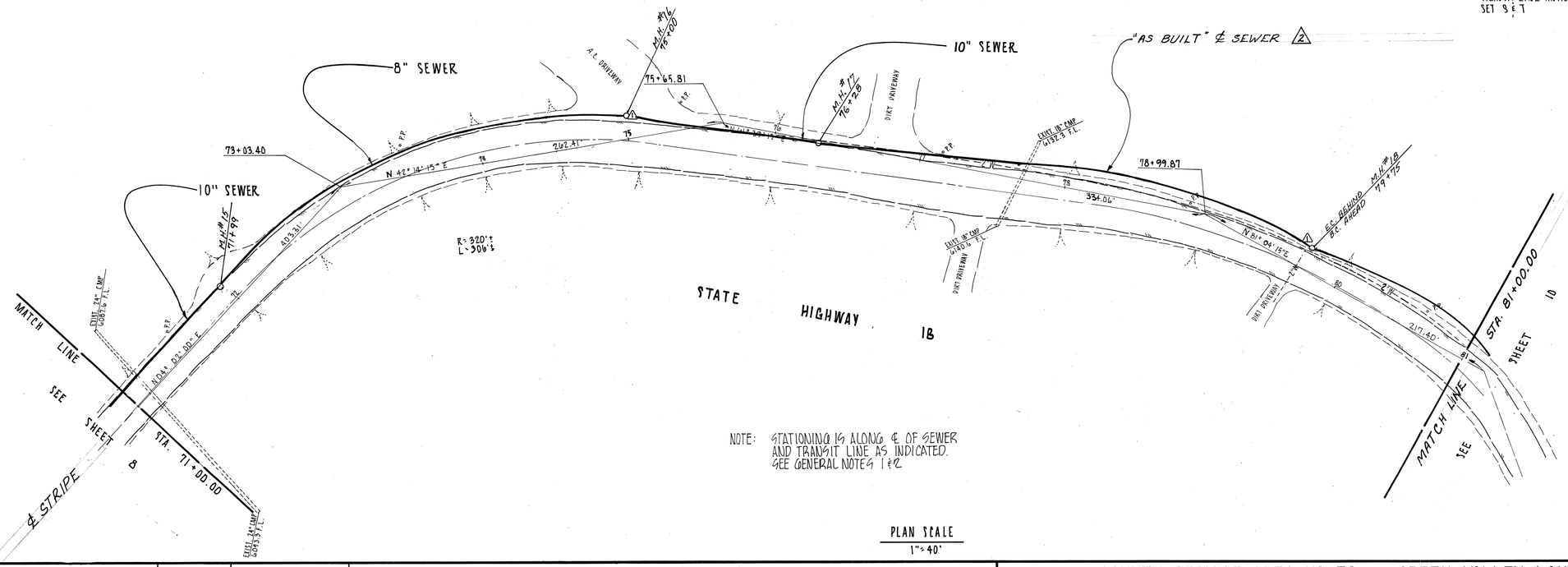
PROFILE SCALE
1"=40' HORIZ.
1"=8' VERT.

INV. 24" CMP 6089.2

BENCH MARK DATA

ELEV. 6109.75
TRANSIT LINE ANGLE POINT STA. 69+00.00
SET S & T

ELEV. 6140.85
TRANSIT LINE ANGLE POINT STA. 81+19.27
SET S & T



NOTE: STATIONING IS ALONG ℄ OF SEWER AND TRANSIT LINE AS INDICATED. SEE GENERAL NOTES 1 & 2

PLAN SCALE
1"=40'

REV	DATE	BY	DESCRIPTION
1	8/76	HN	Revise profile between sta 71+00 & sta. 81+00.
			Delete 8" stubs @ MH # 17 & 18.
2	1/78	HH	REVISE "AS BUILT" ALIGNMENT PLOTTED STA. 77+65 TO STA. 81+00.
3	1/78	HH	REVISE "AS BUILT" LOCATION M.H. # 15, 17, 18. & BEGIN & END.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Titus PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

APPROVED Addy M. Powell — DATE 5-21-74

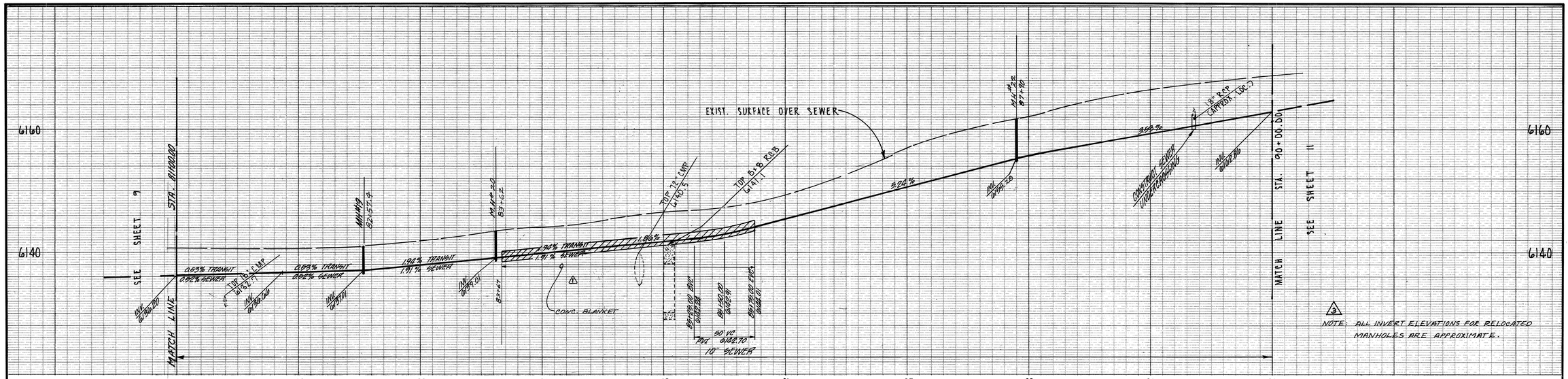
APPROVED R. R. Reed — DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

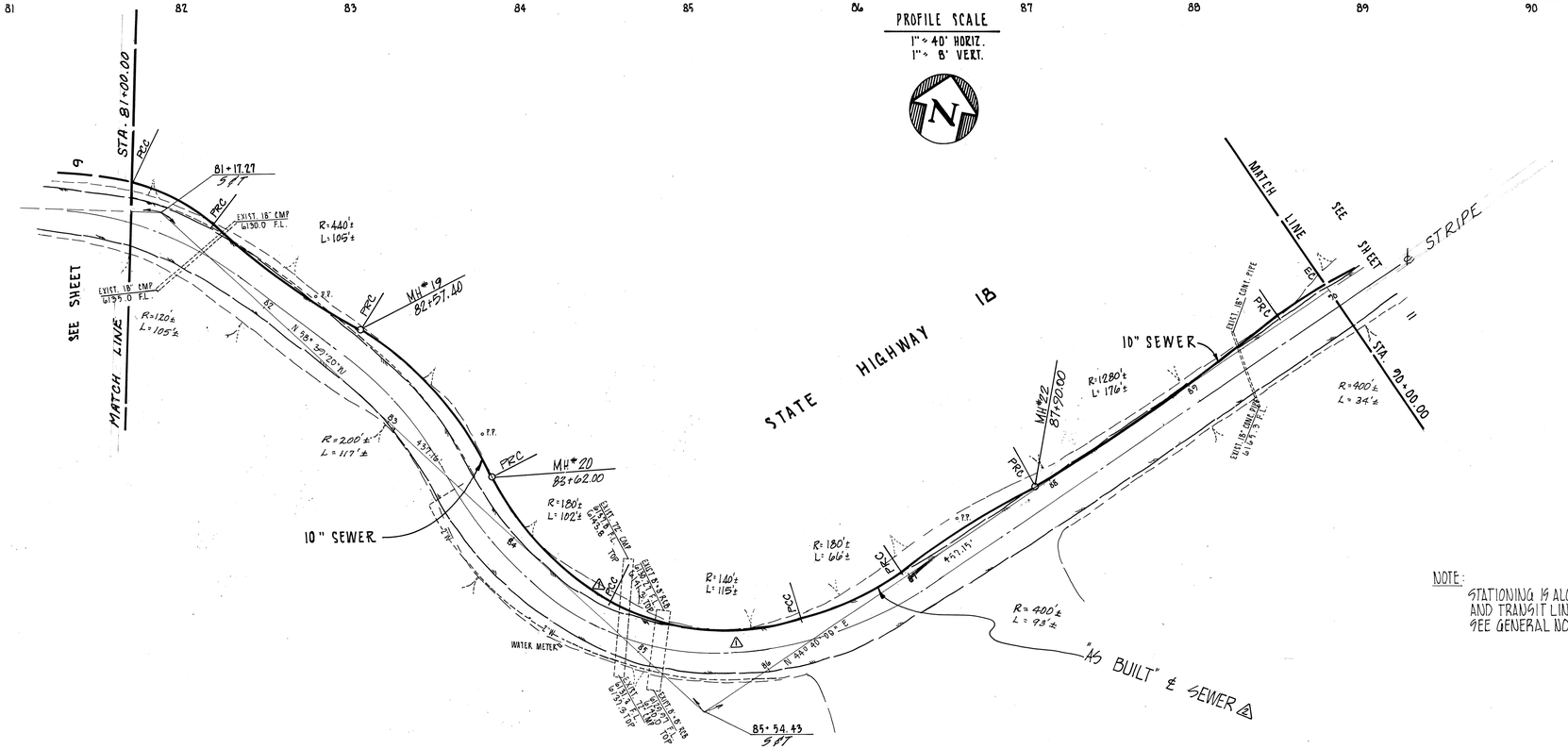
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 71+00 to STA. 81+00

SHEET 9 OF 48



PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.



PLAN SCALE
1" = 40'

NOTE:
STATIONING IS ALONG ℄ OF SEWER AND TRANSIT LINE AS INDICATED
SEE GENERAL NOTES 1 & 2

BENCH MARK DATA

ELEV. 6140.85
TRANSIT LINE ANGLE POINT STA. 81+17.27
SET S & T

ELEV. 6148.93
TRANSIT LINE ANGLE POINT STA. 85+54.43
SET S & T

REV	DATE	BY	DESCRIPTION
1	8/78	H.N.	Revise profile between sta. 81+00 & sta. 90+00. Align. MH 20 to sta. 87+00. Delete 8" stub @ MH 20 & delete MH 21 & 8" stub @ MH 21.
2	1/78	J.	TRANS-TO STA. 90+00.00
3	1/78	J.	PROFILE - AS-BUILT LOCATION OF MH# 21, 20.22 ℄

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

vtn ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE
RECOMMENDED Richard B. Stiles — PROJECT MANAGER — B6D5 R.E. NO. — 4-1-74 DATE

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

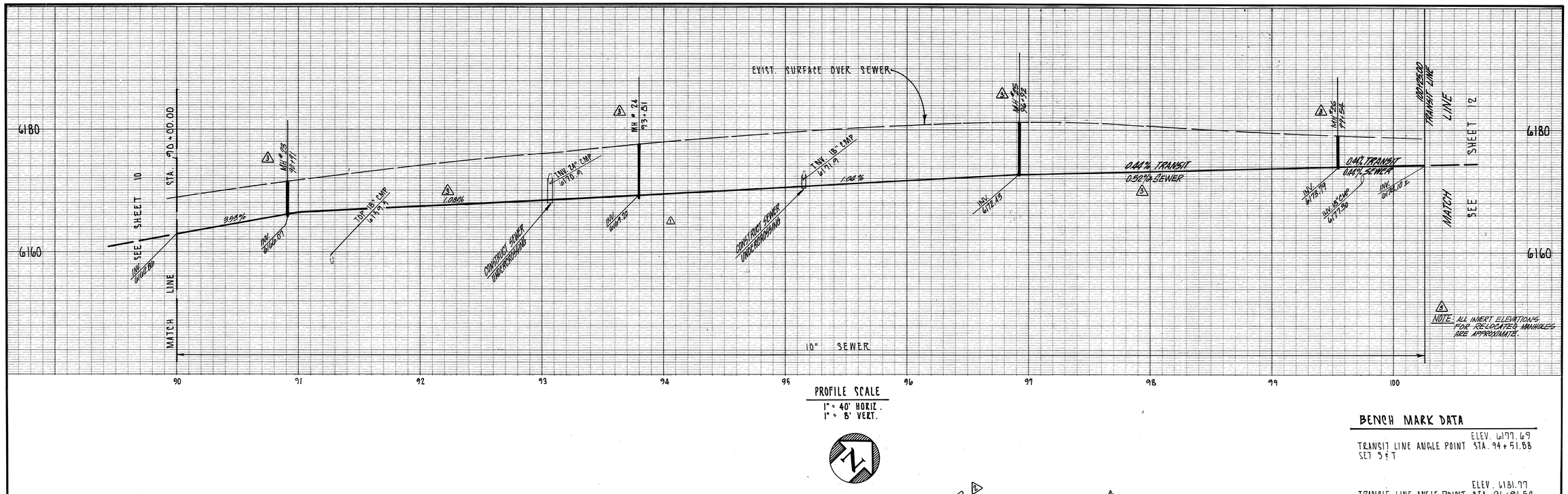
APPROVED Cathy M. Powell — DATE 5-21-74

APPROVED O.R. Reid — DATE 5-21-74

INTERCEPTOR

PLAN AND PROFILE
STATE HIGHWAY 18
STA. 81+00 to STA. 90+00

SHEET 10 OF 48



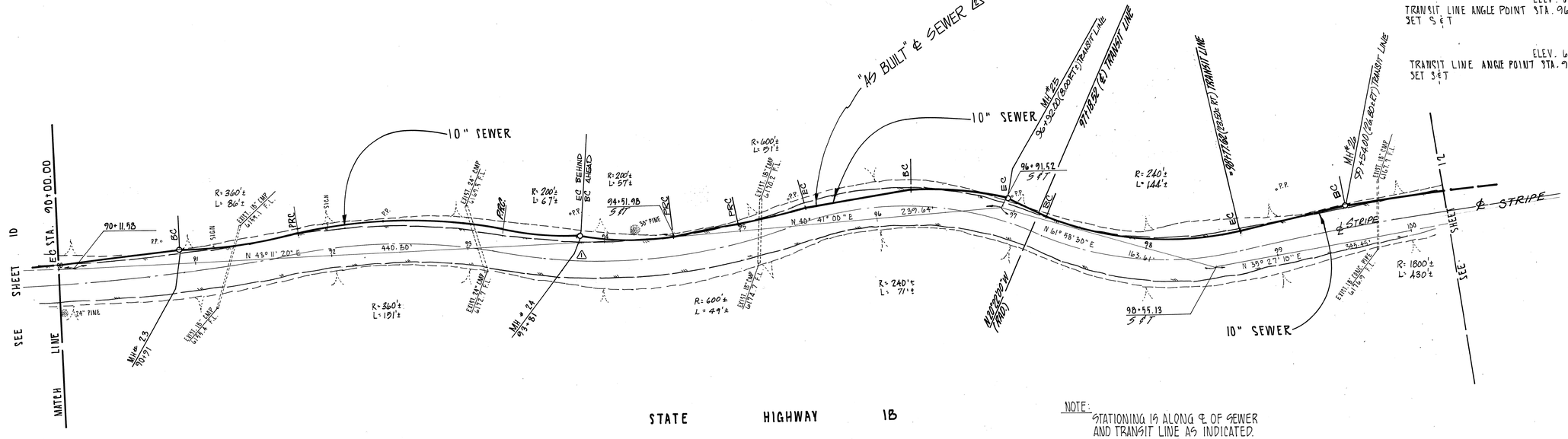
PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

ELEV. 6177.69
TRANSIT LINE ANGLE POINT STA. 94+51.88
SET S & T

ELEV. 6181.77
TRANSIT LINE ANGLE POINT STA. 96+91.52
SET S & T

ELEV. 6179.61
TRANSIT LINE ANGLE POINT STA. 98+55.13
SET S & T



STATE HIGHWAY 18

NOTE:
STATIONING IS ALONG ℄ OF SEWER AND TRANSIT LINE AS INDICATED. SEE GENERAL NOTES 1 & 2.

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Revise profile between Sta 90+00 & MH 23. Delete 5' stub @ MH 23.
2	12/77	J	PLAN - "As Built" alignment plotted Sta. 90+00.00 to 96+92.20. Add "As Built" location of MH #23, 24, 25, 26, Adj.
3	12/77	J	PROFILE - Grades & Added Note.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Jitsuta — PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

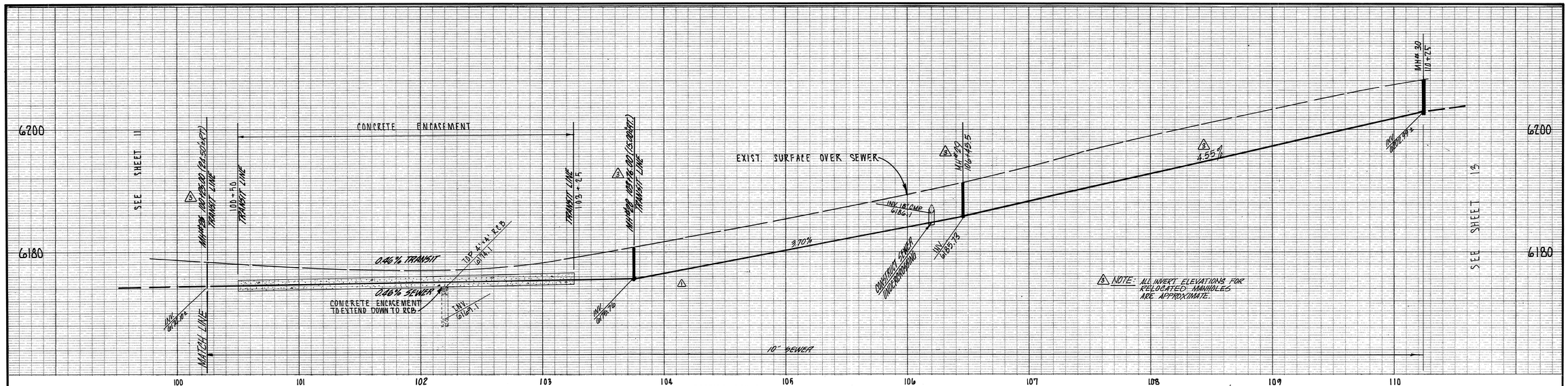
APPROVED Addy M. Powell — DATE 5-21-74

APPROVED A R Reid — DATE 5-21-74

INTERCEPTOR

PLAN AND PROFILE
STATE HIGHWAY 18
STA. 90+00 to STA. 100+00

SHEET 11 OF 48

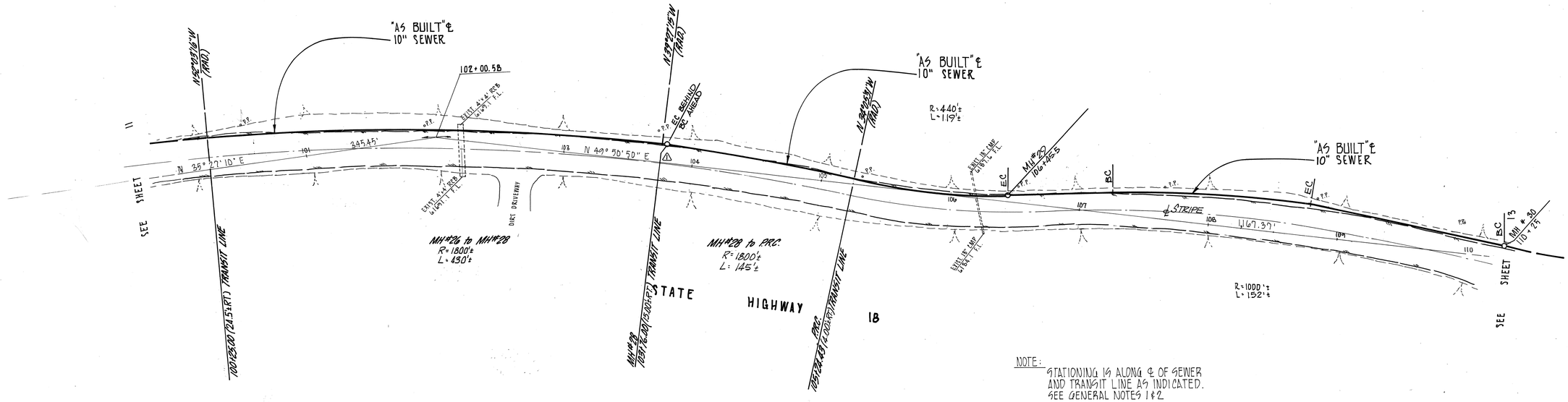


PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA

SET CONC. NAIL AT STA. 109+00 ELEV. 6184.01

SET CONC. NAIL AT STA. 108+00 ELEV. 6198.51



NOTE:
STATIONING IS ALONG ℄ OF SEWER AND TRANSIT LINE AS INDICATED. SEE GENERAL NOTES 1 & 2.

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Revise profile between MH #1 & MH 30. Delete 8" stub @ MH #28.
2	12/77	JD	PLAN - TIE STA. 102+25.00
3	12/77	JD	PROFILE - "AS BUILT" LOCATION OF MH #26, 28, 29 & ADDED NOTE

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GOKES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald K. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Richard S. Titus — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

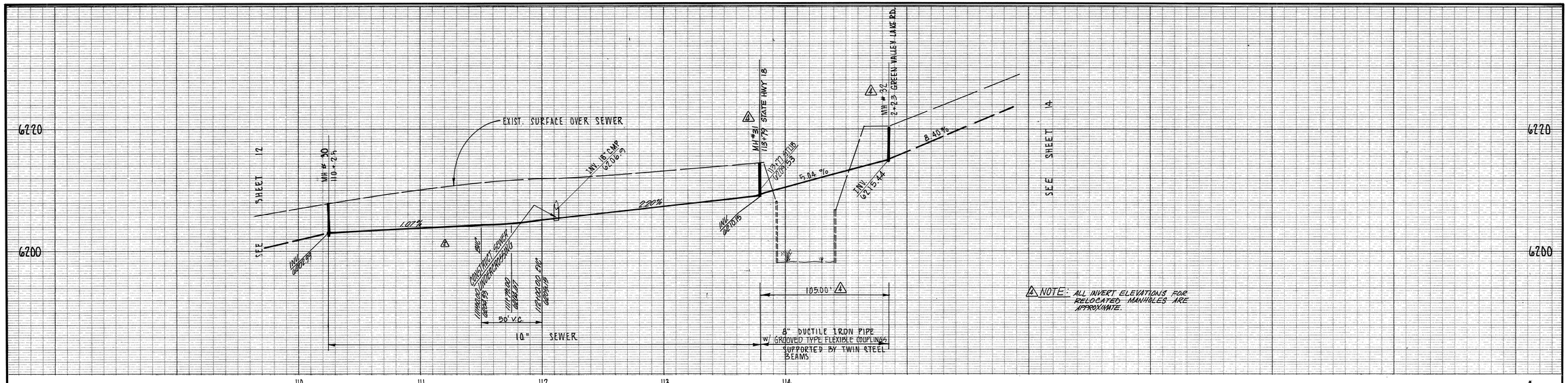
APPROVED Cathy M. Powell — DATE 5-21-74

APPROVED O R Reed — DATE 5-21-74

INTERCEPTOR

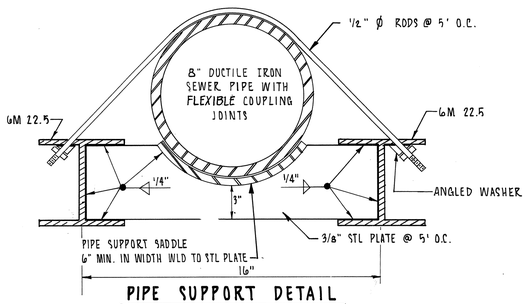
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 100+00 to STA. 110+00

SHEET 12 OF 48

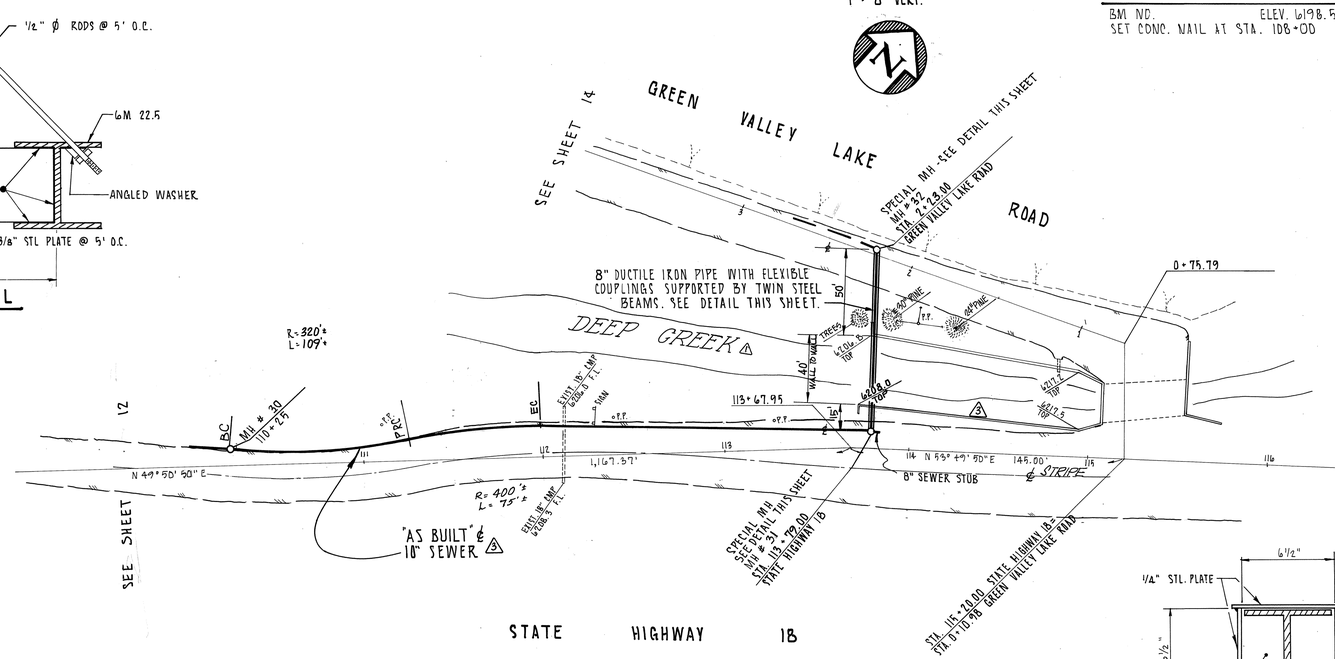


NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.



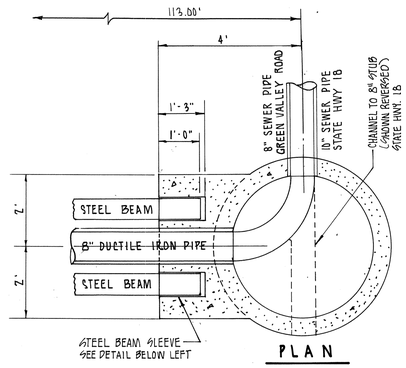
PIPE SUPPORT DETAIL
NO SCALE



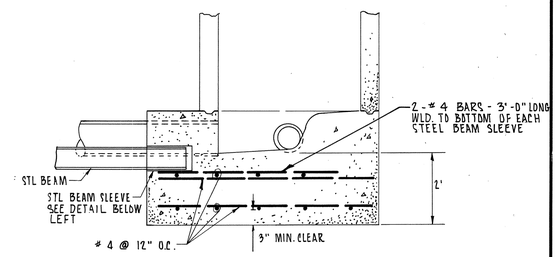
NOTE:
STATIONING IS ALONG TRANSIT LINE.
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

BENCH MARK DATA
BM NO. ELEV. 6198.51
SET CONC. NAIL AT STA. 108+00

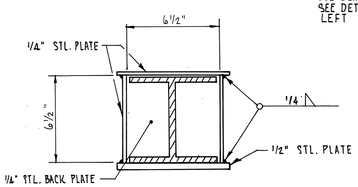


PLAN



SECTION

SPECIAL MANHOLE DETAIL
NO SCALE



STEEL BEAM SLEEVE DETAIL
NO SCALE

REV	DATE	BY	DESCRIPTION
1	7/76	H.N.	ADD "DEEP CREEK".
2	8/76	H.N.	Revise profile between MH 30 & MH 31.
3	12/77	J.P.	PLAN - STA. 2+23.80 & CORRECTED PLANS X-ING.
4	12/77	J.P.	PROFILE - "AS BUILT" ELEVATION OF MH # 31.32 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED DR. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Richard S. Titus — PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

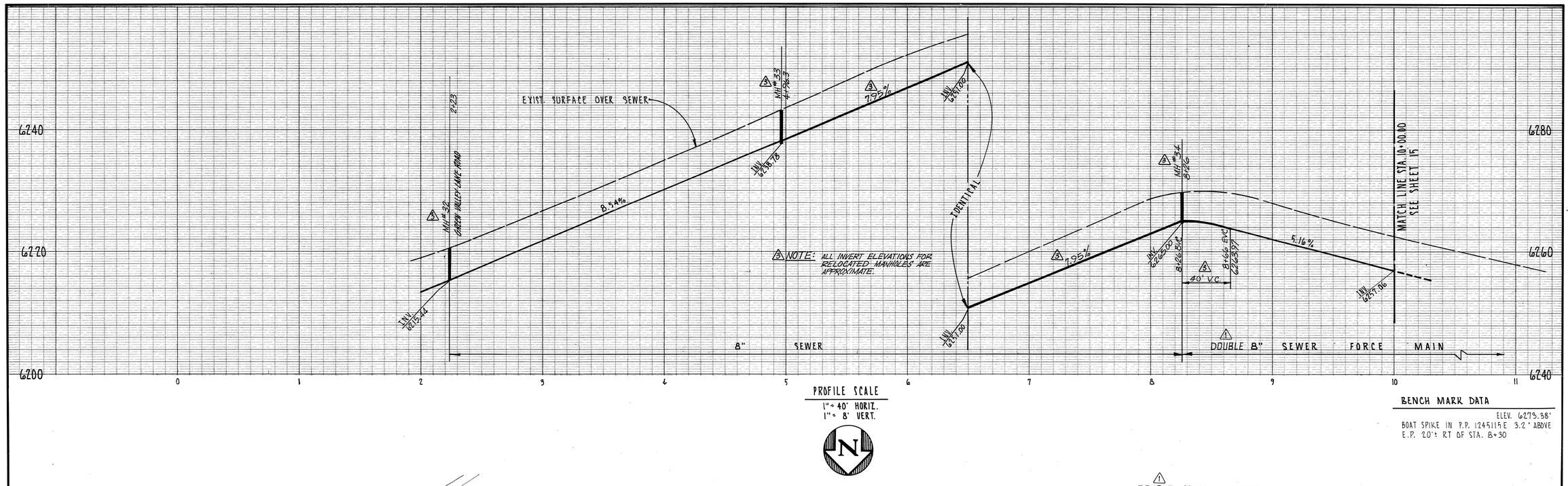
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Ashby McDonell — DATE 5-21-74

APPROVED C. R. Reid — DATE 5-21-74

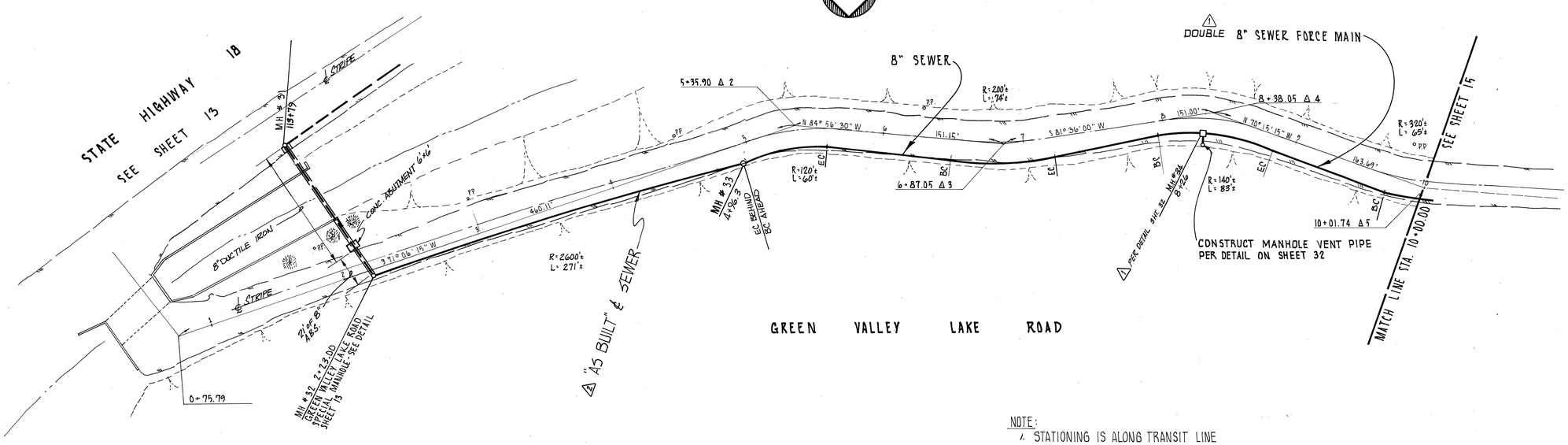
INTERCEPTOR
PLAN AND PROFILE
STATE HIGHWAY 18
STA. 110+00 to GREEN VALLEY LAKE ROAD

SHEET 13 OF 48



PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA
ELEV. 6273.38'
BOAT SPIKE IN P.P. 12451115 E 3.2' ABOVE E.P. 20'± RT OF STA. 8+30



NOTE:
1. STATIONING IS ALONG TRANSIT LINE SEE GENERAL NOTES 1 & 2.
2. DOUBLE 8" INVERTED SIPHON REFERRED TO AS FORCE MAIN IN SPECIFICATIONS.

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Added "Double" 8 Force Main Rev. M.H.# 34 Added Note 2
2	12/77	JL	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 2+23.00 TO STA. 10+00.00
3	12/77	JL	PROFILE - "AS BUILT" LOCATION OF MH # 32, 33, 34 & PROFILE - ADDED NOTE 2 VERT. CURVE

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — R.E. NO. 19406 — DATE 4-1-74

RECOMMENDED Richard S. Stites PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

APPROVED Ashby M. Buell — DATE 5-21-74

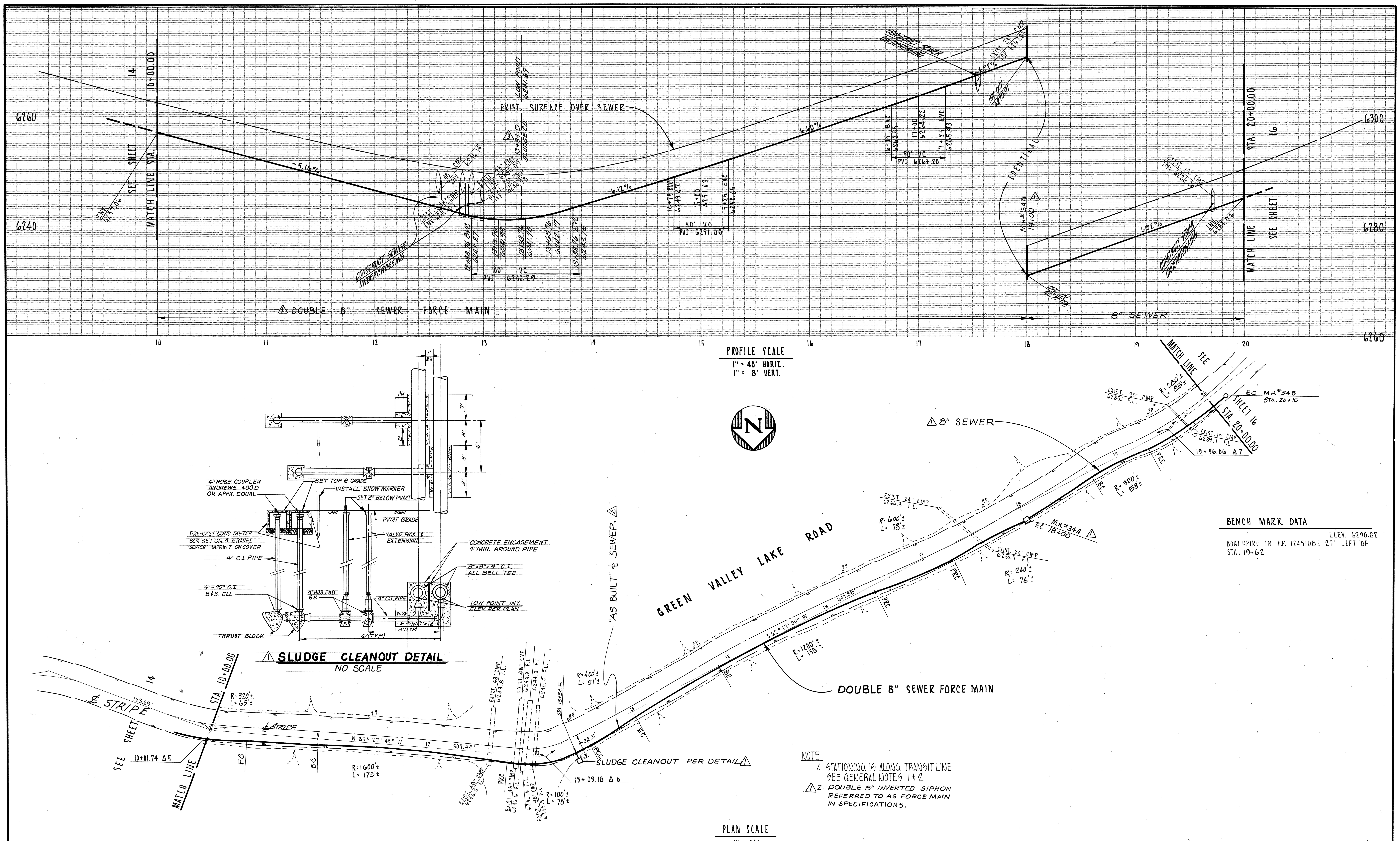
APPROVED [illegible] — DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STATE HIGHWAY 18 to STA. 10+00

SHEET 14 OF 48



NOTE:
1. STATIONING IS ALONG TRANSIT LINE SEE GENERAL NOTES 1 & 2
1 2. DOUBLE 8" INVERTED SIPHON REFERRED TO AS FORCE MAIN IN SPECIFICATIONS.

BENCH MARK DATA
ELEV. 6290.82
BOAT SPIKE IN P.P. 1245108E 27' LEFT OF STA. 19+62

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Added M.H.#34A; Revised Sludge C.O. Detail; Removed Elec Power Detail; Added L.P. Elev @ Sta. 13+20.74 Added Double Force Main Sta 10+00 to Sta 18+00
2	10/77	J.P.	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 10+00.00 TO STA. 20+00.00
3	10/77	J.P.	PROFILE - "AS BUILT" LOCATION OF SLUDGE C.O.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

vtn ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison 19466 4-1-74
PROJECT ENGINEER R.E. NO. DATE

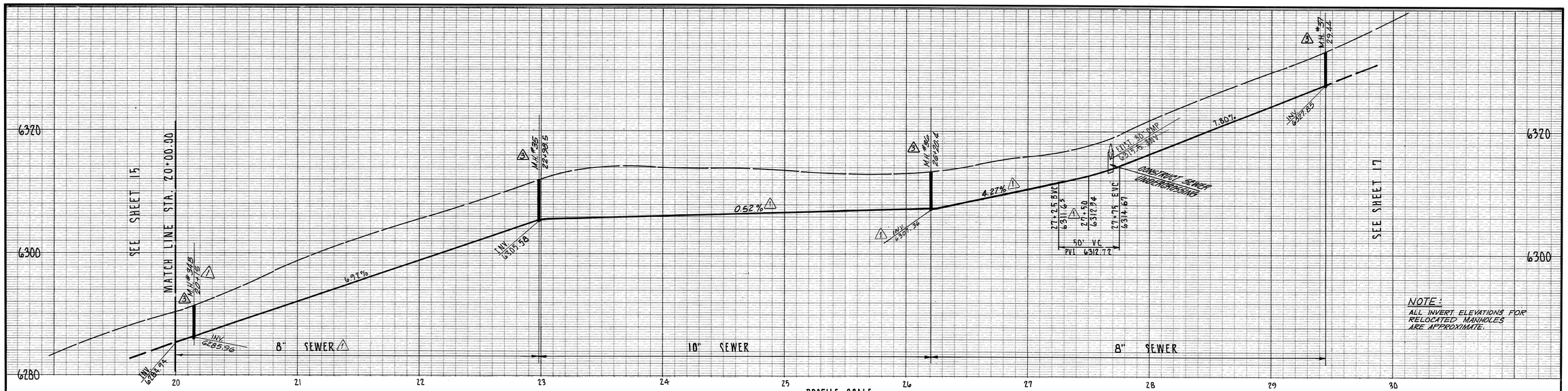
RECOMMENDED Richard S. Titera B605 4-1-74
PROJECT MANAGER R.E. NO. DATE

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Ashley M. Powell DATE 5-21-74
APPROVED A. R. Reid DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 10+00 to STA. 20+00

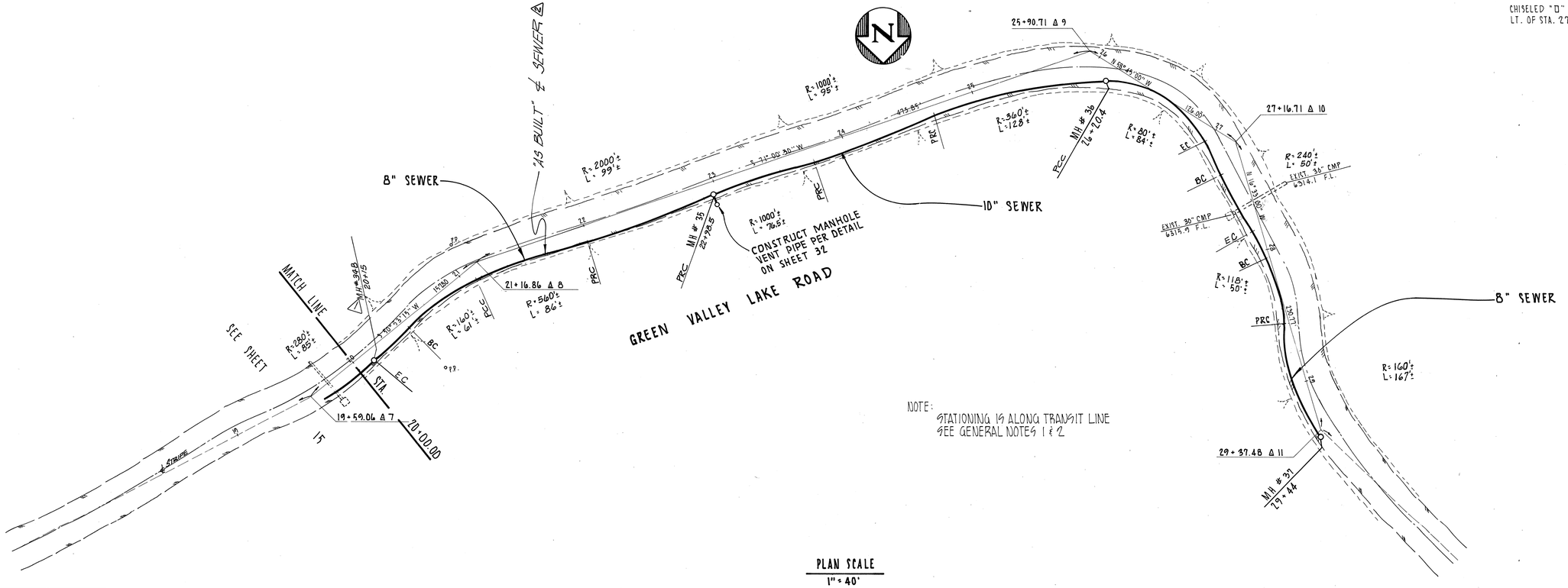
SHEET 15 OF 48



NOTE:
ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA
ELEV. 6317.51'
CHISELED "D" ON TOP OF BOULDER. 30'± LT. OF STA. 27+00, PAINTED ORANGE



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Added M.H.# 348 at sta 20+20 Rem. Force Main sta 19+59
2	10/77	JP	PLAN "AS BUILT" ALIGNMENT PLOTTED STA. 20+00.00 TO STA. 29+44.00
3	10/77	JP	PROFILE "AS BUILT" LOCATION OF M.H.# 348, 35, 36, 37 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

vtn ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED
Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED
Richard S. Tatera — PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

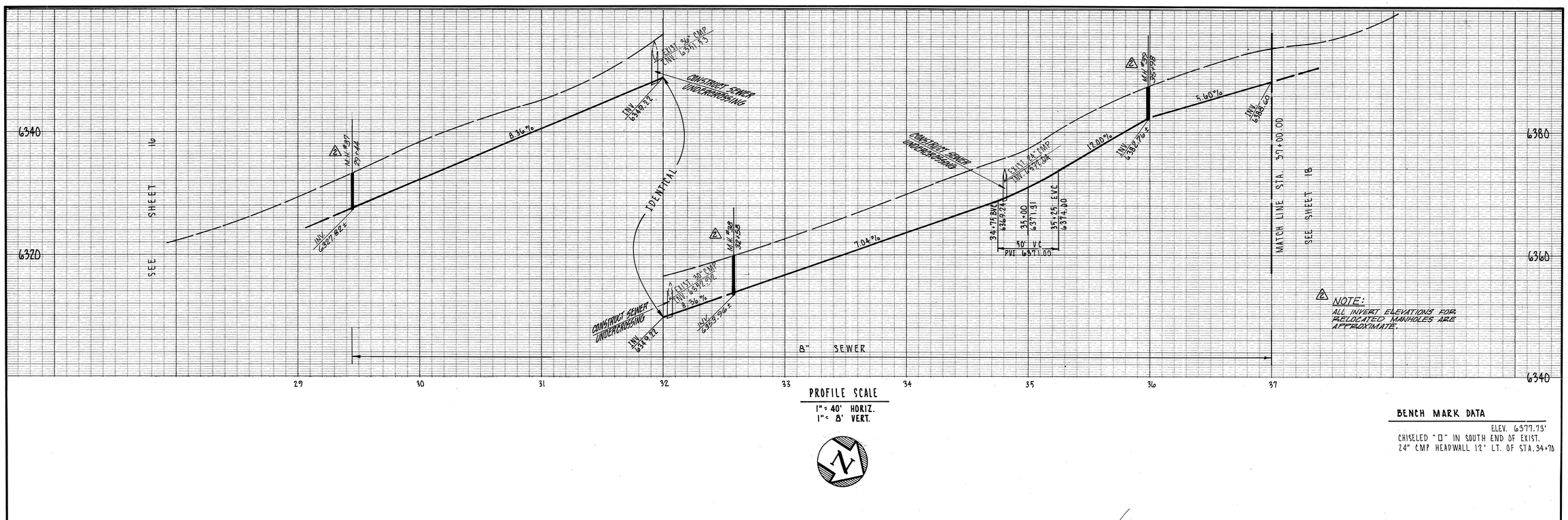
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Cathy McDowell — DATE 5-21-74

APPROVED A R Reid — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 20+00 to STA. 29+50

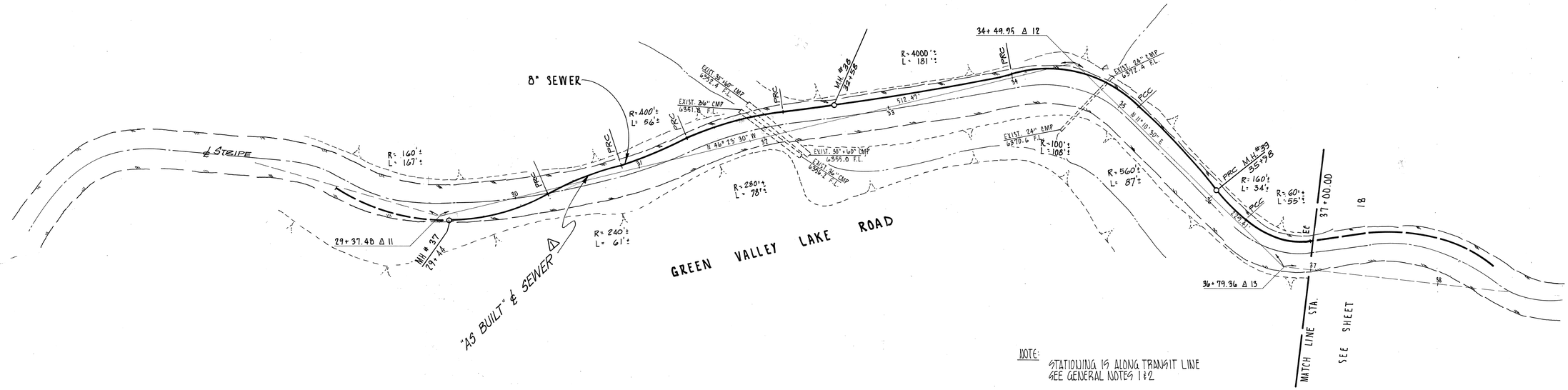
SHEET 16 OF 48



NOTE:
ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA
ELEV. 6377.73'
CHISELED "□" IN SOUTH END OF EXIST. 24" CMP HEADWALL 12' LT. OF STA. 34+78



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	10/77	JD	PLAN - AS BUILT ALIGNMENT FROM STA. 29+48 TO STA. 37+00.
2	6/79	JD	PROFILE - AS BUILT LOCATION OF M.H.'S 37, 38, 39 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald M. Allison PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Roland L. Tatum PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

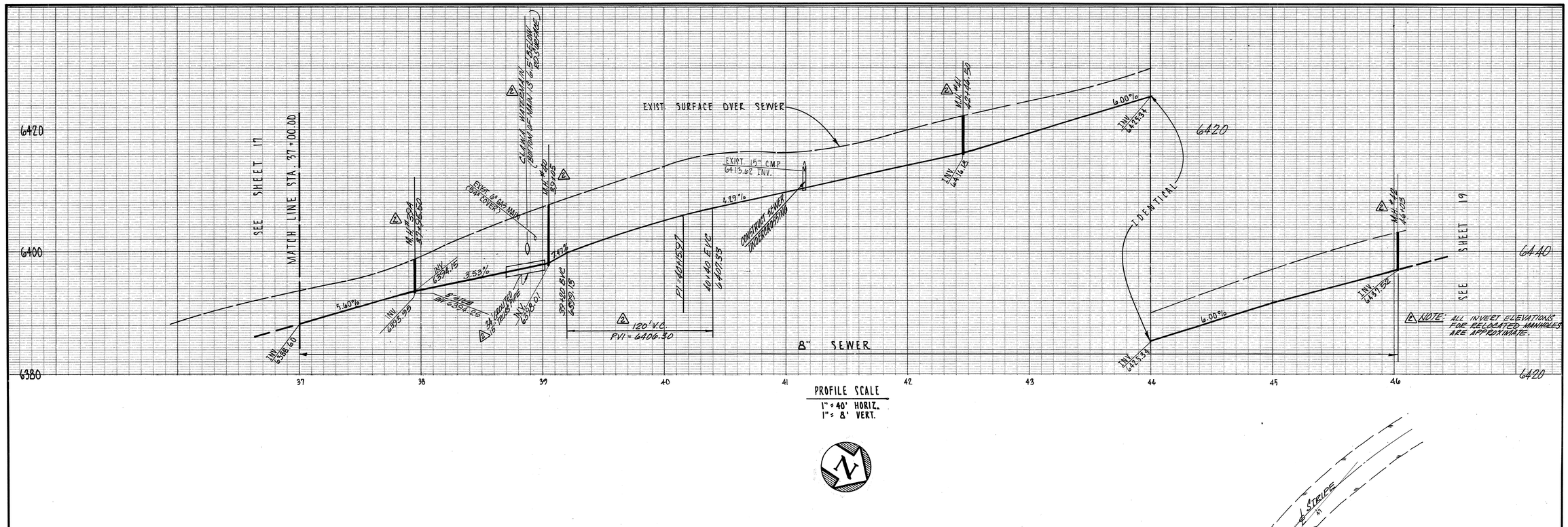
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Ashley M. Powell — DATE 5-21-74

APPROVED O. R. Reid — DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 29+50 to STA. 37+00

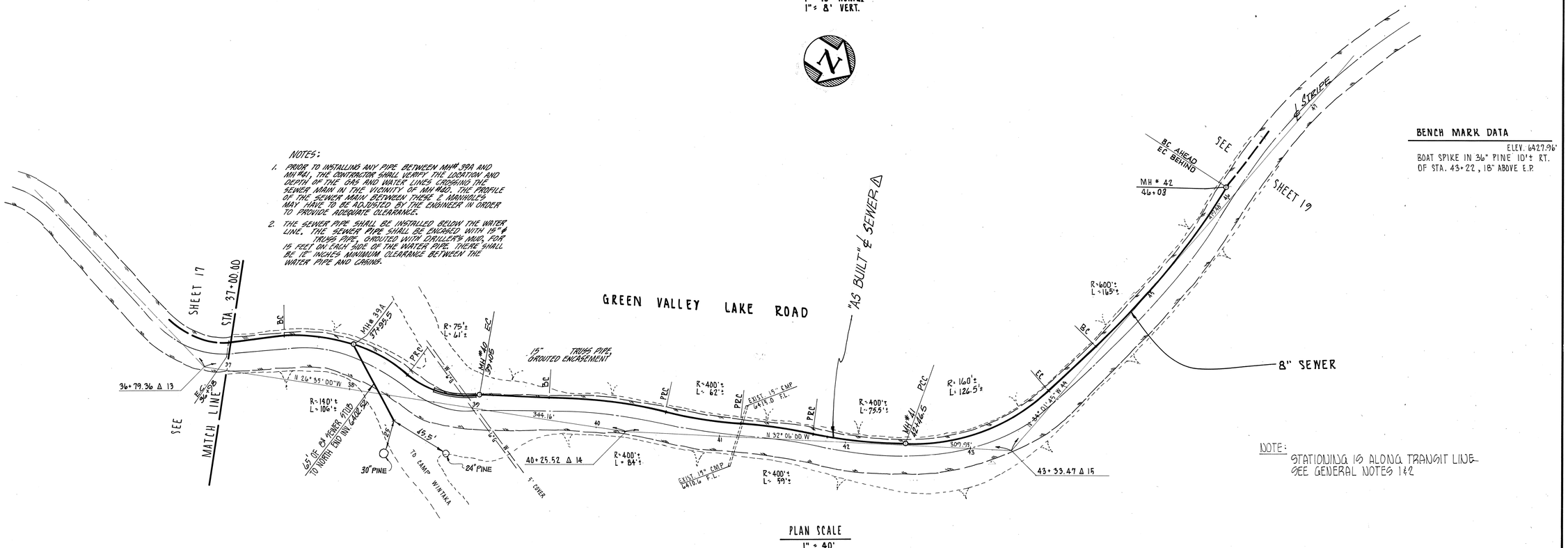
SHEET 17 OF 48



PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

NOTES:

1. PRIOR TO INSTALLING ANY PIPE BETWEEN MH# 39A AND MH #41, THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE GAS AND WATER LINES CROSSING THE SEWER MAIN IN THE VICINITY OF MH #40. THE PROFILE OF THE SEWER MAIN BETWEEN THESE 2 MANHOLES MAY HAVE TO BE ADJUSTED BY THE ENGINEER IN ORDER TO PROVIDE ADEQUATE CLEARANCE.
2. THE SEWER PIPE SHALL BE INSTALLED BELOW THE WATER LINE. THE SEWER PIPE SHALL BE ENCASED WITH 18" ø TRUSS PIPE, GROUTED WITH DRILLER'S MUD, FOR 15 FEET ON EACH SIDE OF THE WATER PIPE. THERE SHALL BE 12" INCHES MINIMUM CLEARANCE BETWEEN THE WATER PIPE AND CASING.



PLAN SCALE
1" = 40'

BENCH MARK DATA
ELEV. 6427.96'
BOAT SPIKE IN 36" PINE 10'± RT. OF STA. 43+22, 18" ABOVE E.P.

NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

REV	DATE	BY	DESCRIPTION
1	10/77	JD	PLAN-"AS BUILT" ALIGNMENT PLOTTED STA. 37+00.00 TO STA. 46+00.00
2	11/77	JD	PROFILE-"AS BUILT" & SEWER MAIN & LOCATION OF M.H.'S #39A, #41, #42 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Richard S. Stites PROJECT MANAGER — R.E. NO. B605 — DATE 4-1-74

APPROVED Ashby McDowell — DATE 5-21-74

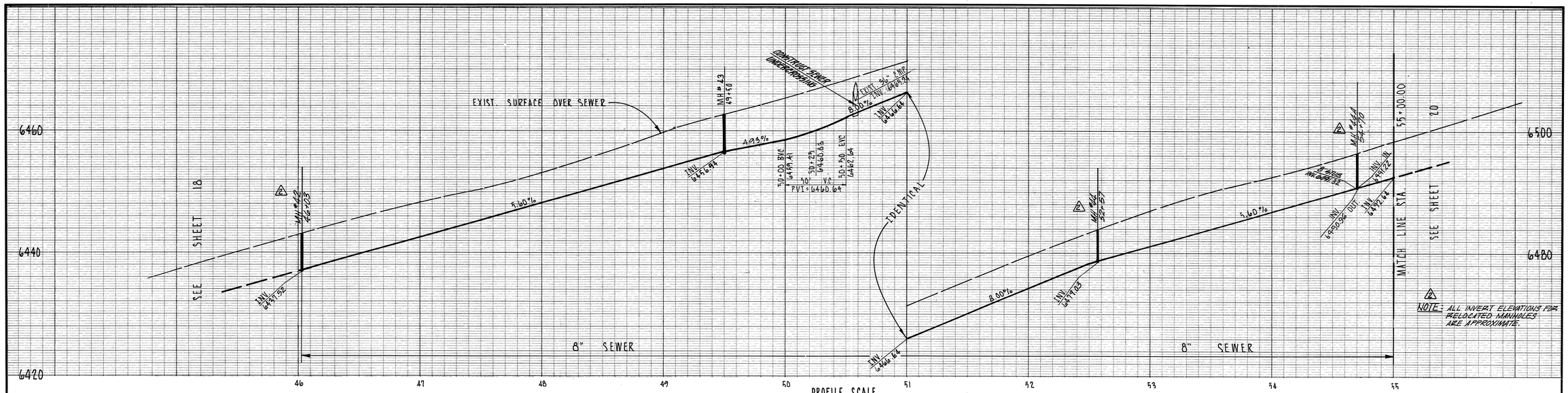
APPROVED A P Reed — DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

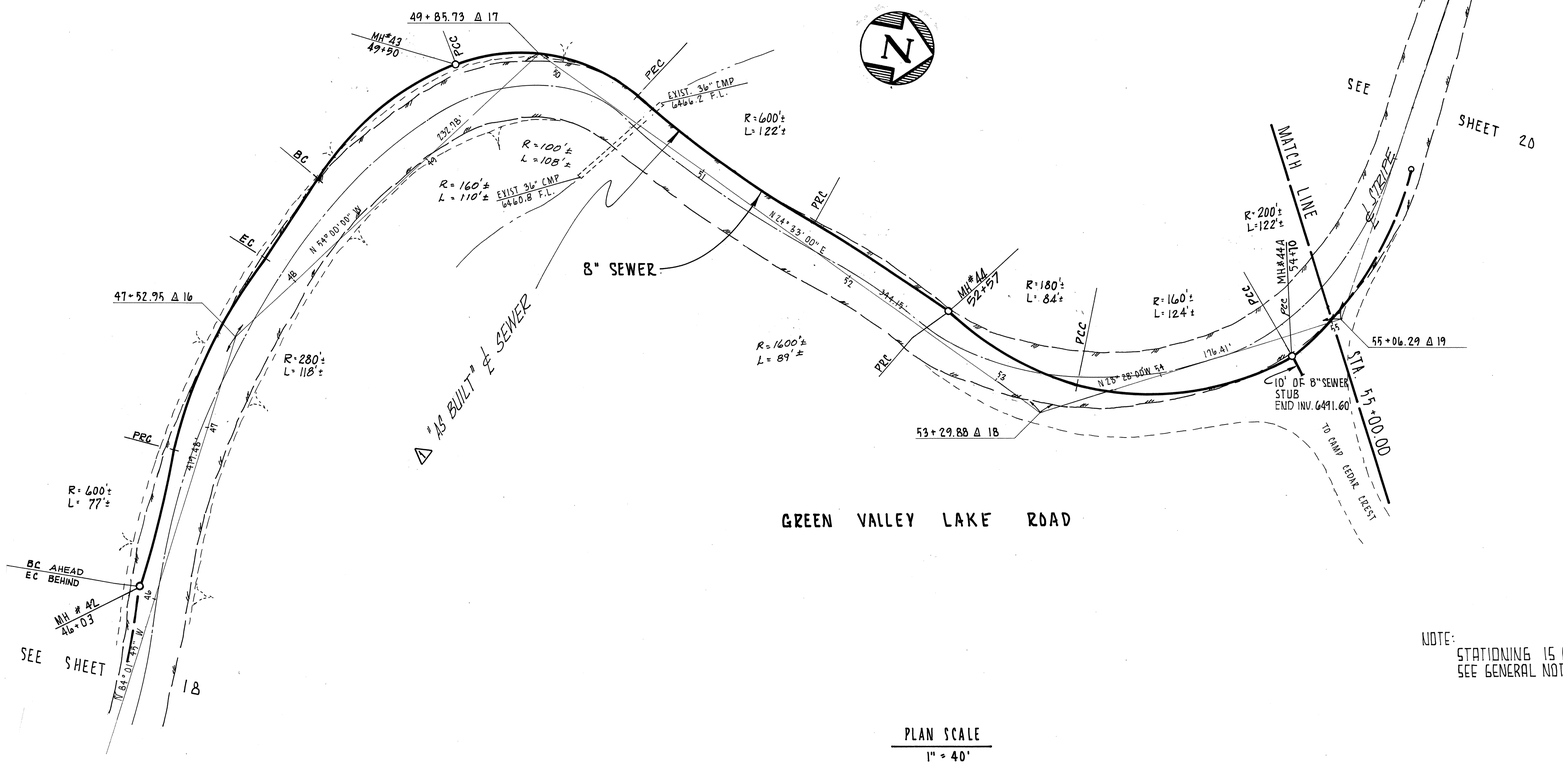
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 37+00 to STA. 46+00

SHEET 18 OF 48



NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.



BENCH MARK DATA

ELEV. 6491.07'
BOAT SPIKE IN 36" PINE 40' LEFT OF STA. 53+10

NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	11/77	JD	PLAN: "AS BUILT" ALIGNMENT PLOTTED STA. 46+03 TO STA. 55+00
2	11/77	JD	PROFILE: REVISED LOCATION OF MH # 45, 46, 44A & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

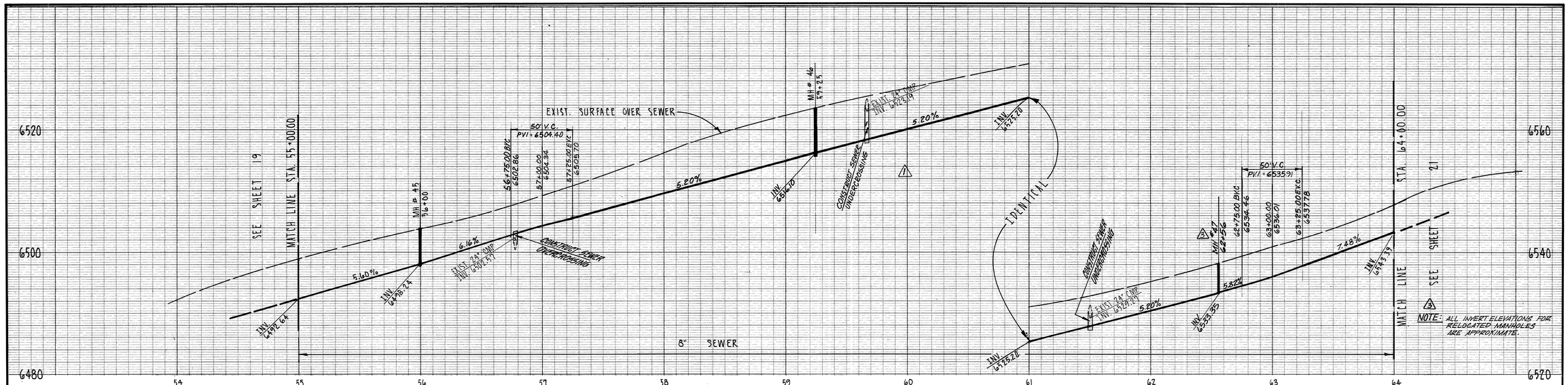
SUBMITTED Donald R. Allison (PROJECT ENGINEER) 19466 (R.E. NO.) 4-1-74 (DATE)
RECOMMENDED Richard S. Jitera (PROJECT MANAGER) 8605 (R.E. NO.) 4-1-74 (DATE)

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy McDonald DATE 5-21-74
APPROVED O.R. Reid DATE 5-21-74

INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 46+00 to STA. 55+00

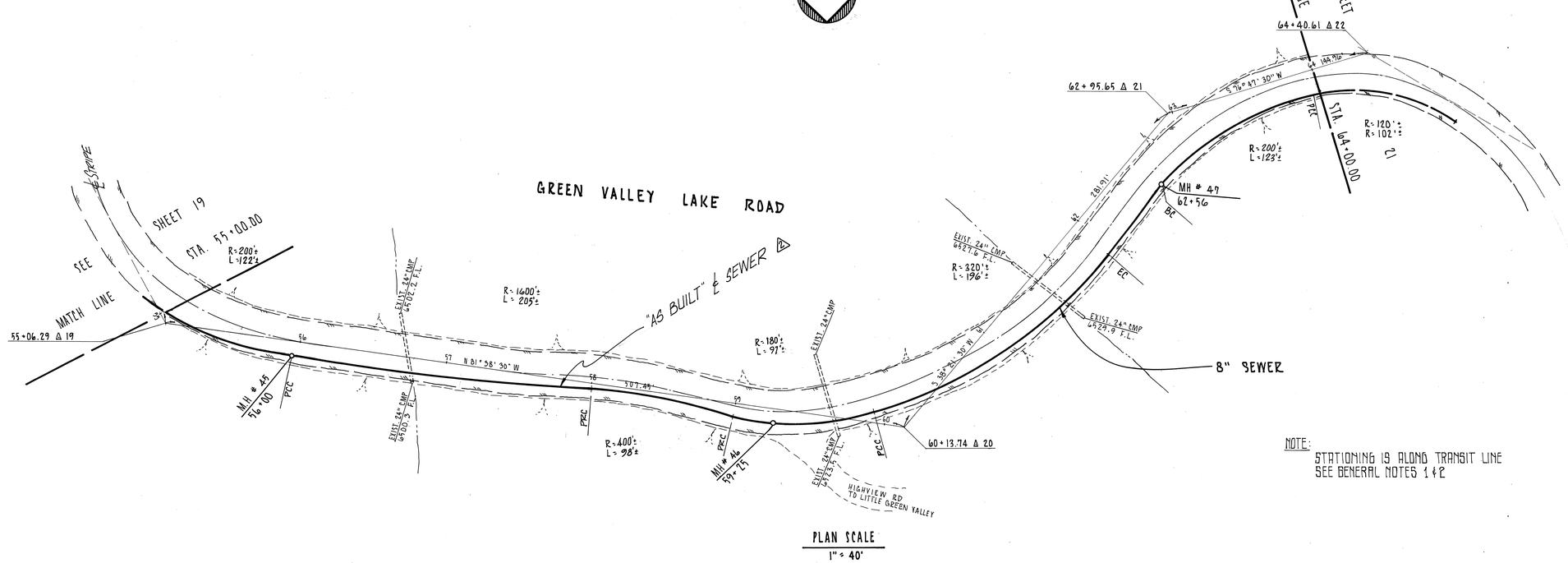
SHEET 19 OF 48



NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA
ELEV. 6546.33'
CONC. NAIL IN TOP OF BOULDER
13' LT. OF STA. 63+10, PAINTED ORANGE



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Revised Profile from sta. 56 to sta. 64
2	11/77	JL	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 55+00.00 TO STA. 64+00.00
3	11/77	JL	PROFILE - "AS BUILT" LOCATION OF MH #47 & ADDED NOTE

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19406 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Titus — PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

APPROVED Ashley McDowell — DATE 5-21-74

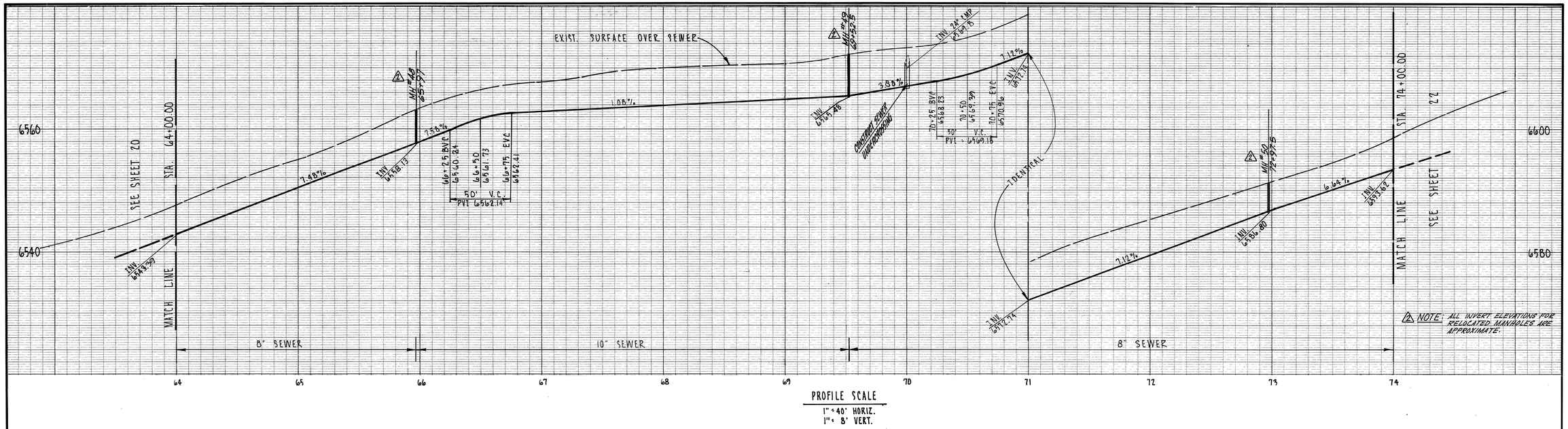
APPROVED A R Reid — DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

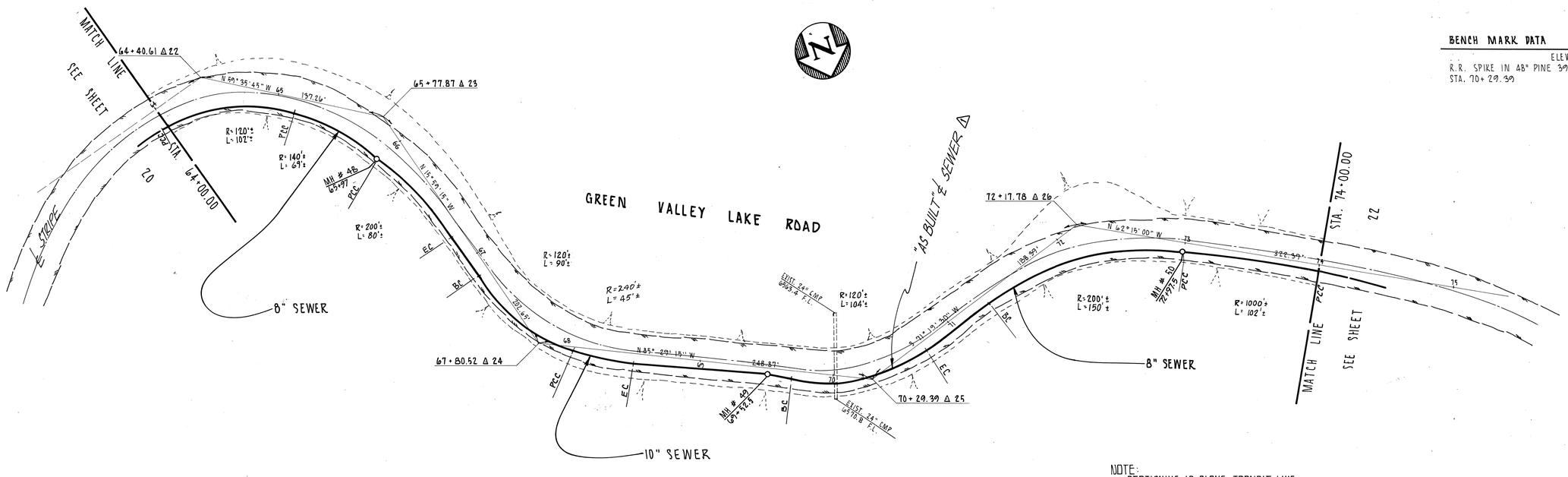
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 55+00 to STA. 64+00

SHEET 20 OF 48



NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.



BENCH MARK DATA

ELEV. 6573.99'
R.R. SPIKE IN 48" PINE 39'± RT.
STA. 70+29.39

NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	8/77	JJ	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA 64+00.00 TO STA. 74+00.00
2	9/77	JJ	PROFILE - "AS BUILT" LOCATION OF MH #45,49,60 & HARD NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — 10466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Stites PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

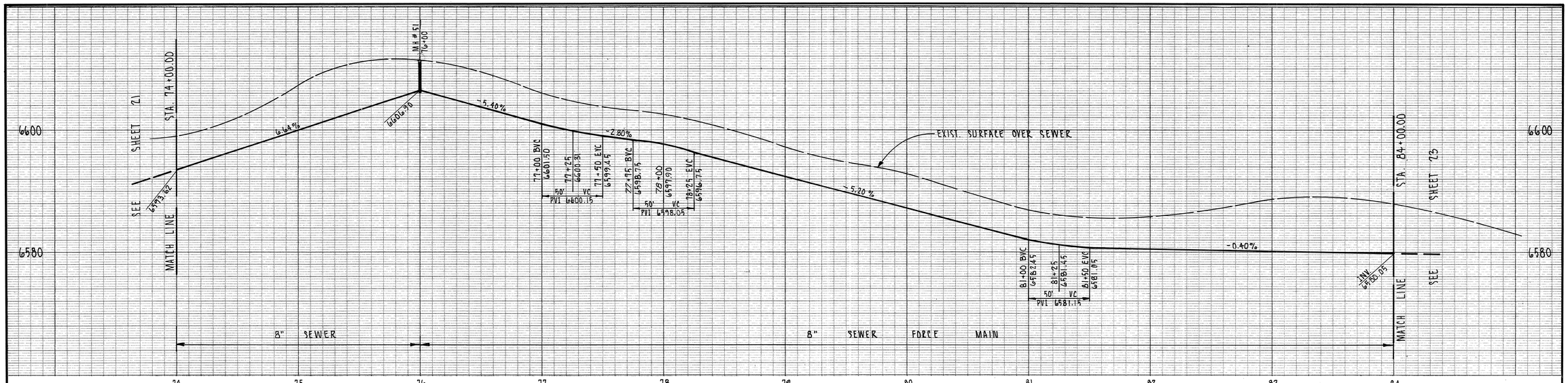
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Addy M. Powell — DATE 5-21-74

APPROVED R R Reed — DATE 5-21-74

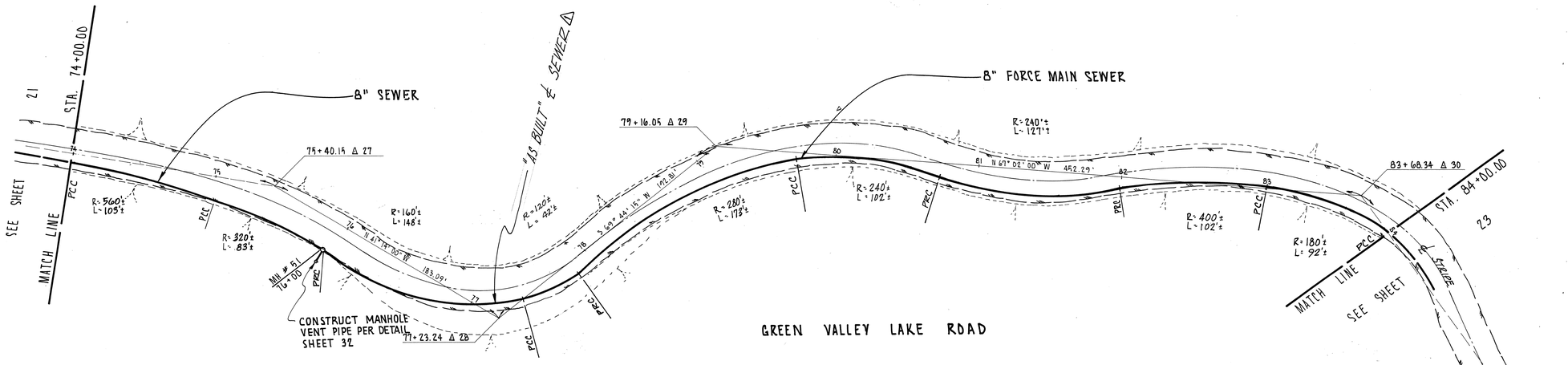
INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY-LAKE ROAD
STA. 64+00 to STA. 74+00

SHEET 21 OF 48



PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.

BENCH MARK DATA
ELEV. 6597.57'
BOAT SPIKE IN 24" PINE 32' LEFT OF STA. 80+00.00



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

REV	DATE	BY	DESCRIPTION
1	11/74	JP	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 74+00.00 TO STA. 84+00.00

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED P.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald K. Allison PROJECT ENGINEER — R.E. NO. 19466 — DATE 4-1-74

RECOMMENDED Richard S. Titus PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

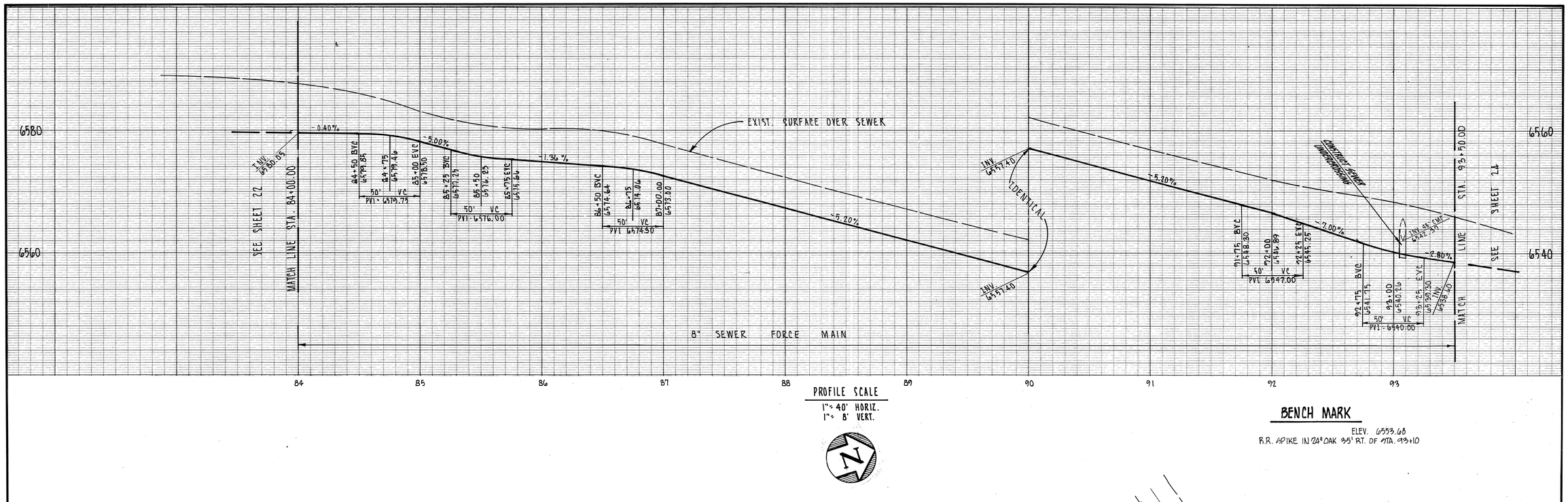
APPROVED Ashley M. Powell — DATE 5-21-74

APPROVED O R Reed — DATE 5-21-74

INTERCEPTOR

PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 74+00 to STA. 84+00

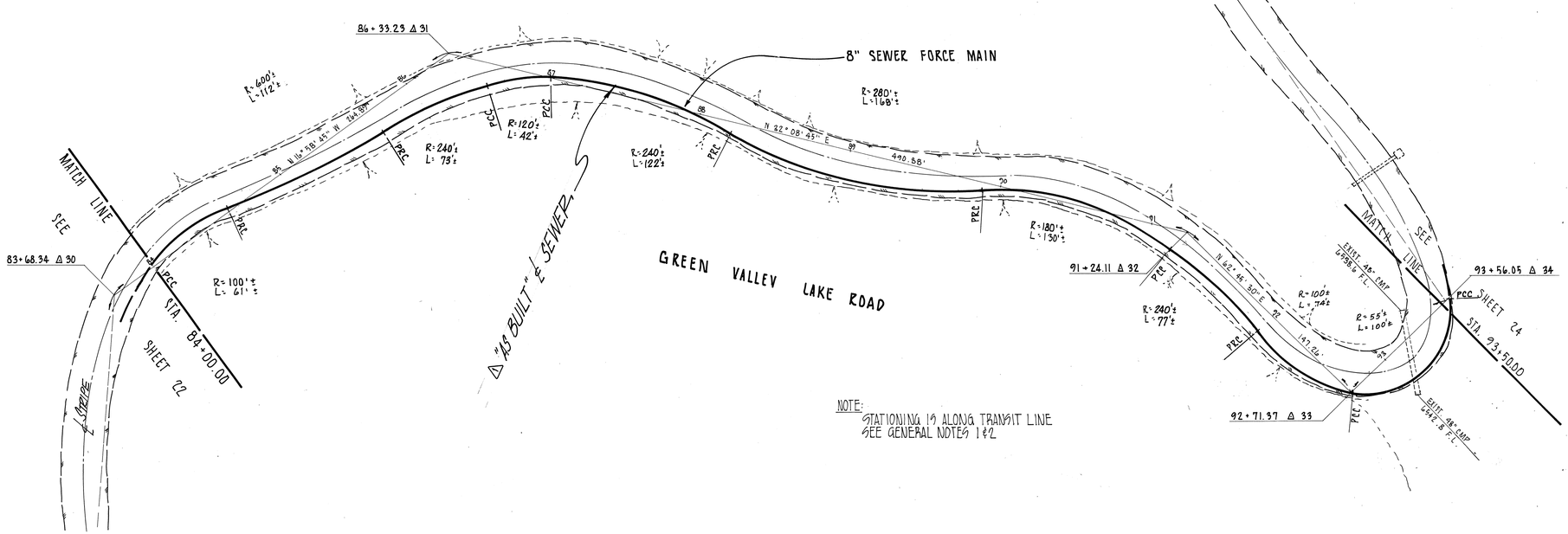
SHEET 22 OF 48



PROFILE SCALE
1"= 40' HORIZ.
1"= 8' VERT.

BENCH MARK

ELEV. 6553.68
B.R. APIKE IN 24" OAK 35' RT. OF STA. 93+10



NOTE:
STATIONING IS ALONG TRANSIT LINE
SEE GENERAL NOTES 1 & 2

PLAN SCALE
1"= 40'

REV	DATE	BY	DESCRIPTION
1	11/74	JH	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 84+00.00 TO STA. 93+50.00

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

vtn ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Titus PROJECT MANAGER — 8605 R.E. NO. — 4-1-74 DATE

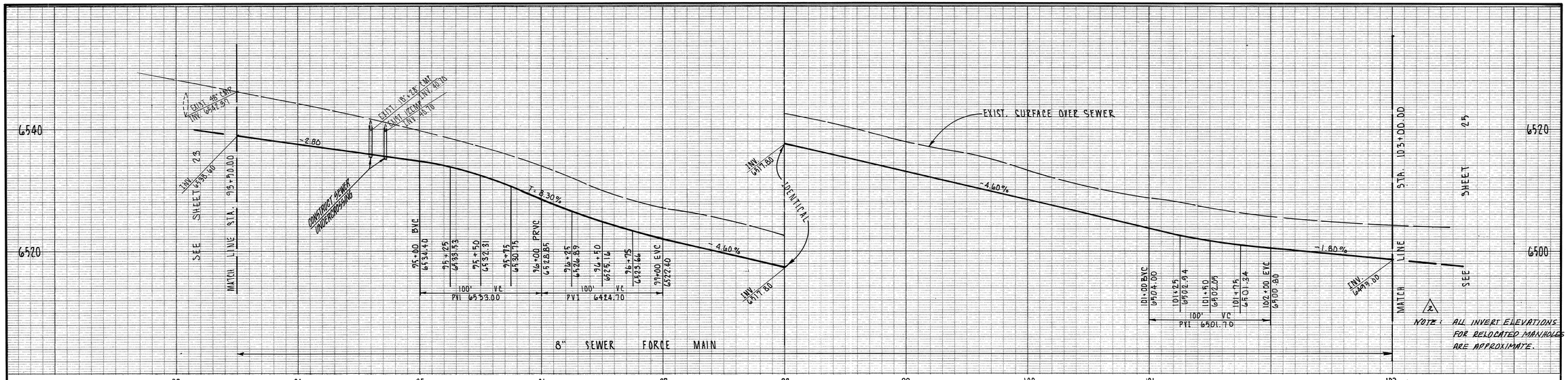
COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

APPROVED Cathy McDonell — DATE 5-21-74

APPROVED G R Reed — DATE 5-21-74

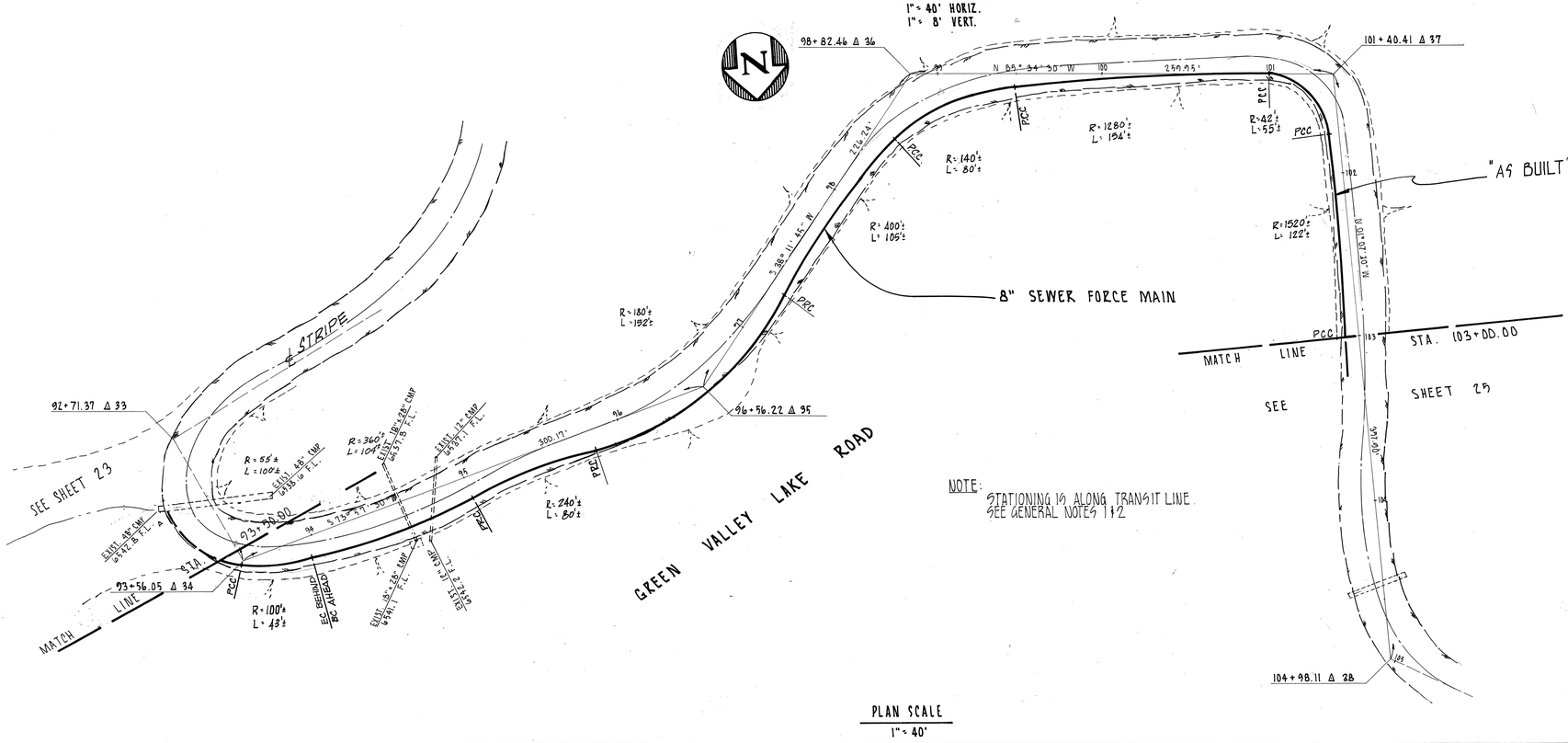
INTERCEPTOR
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 84+00 to STA. 93+00

SHEET 23 OF 48



NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE
1" = 40' HORIZ.
1" = 8' VERT.



NOTE: STATIONING IS ALONG TRANSIT LINE SEE GENERAL NOTES 1 & 2

PLAN SCALE
1" = 40'

BENCH MARK DATA

ELEV. 6553.68'
R.R. SPIKE IN 24" OAK 35' RT. OF STA. 93+10

ELEV. 6515.94'
BOAT SPIKE IN LEANING 18" OAK 40' LT. OF STA. 99+60, PAINTED ORANGE

REV	DATE	BY	DESCRIPTION
⚠1	11-77	JP	PLAN - "AS BUILT" ALIGNMENT PLOTTED STA. 93+50.00 TO STA. 103+00.00

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Donald R. Allison — PROJECT ENGINEER — 19466 R.E. NO. — 4-1-74 DATE

RECOMMENDED Richard S. Jutras — PROJECT MANAGER — B6051 R.E. NO. — 4-1-74 DATE

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

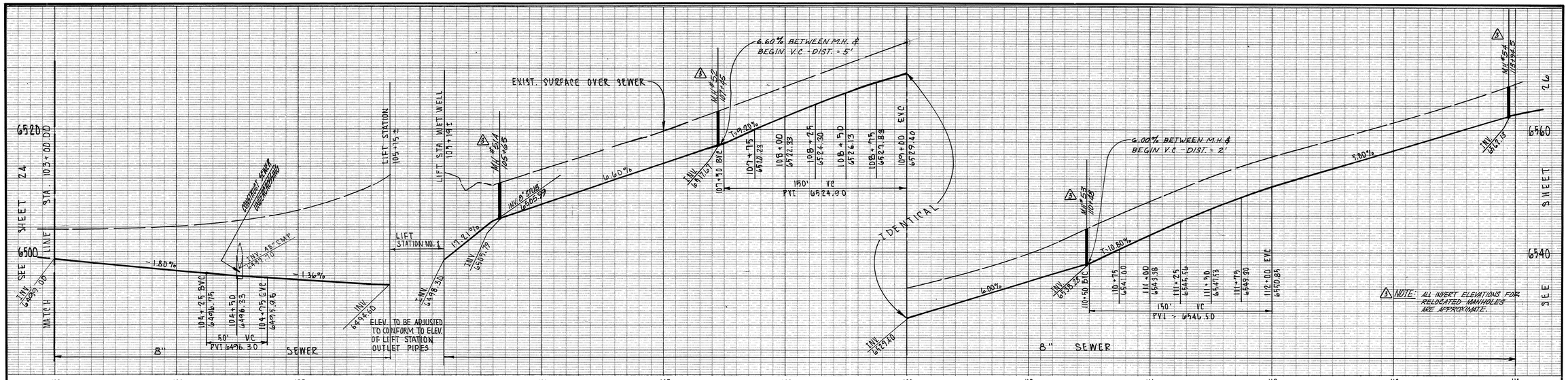
APPROVED Ashley W. Powell — DATE 5-21-74

APPROVED R R Reed — DATE 5-21-74

INTERCEPTOR

PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 93+00 to STA. 103+00

SHEET 24 OF 48



3 NOTE: ALL INVERT ELEVATIONS FOR RELOCATED MANHOLES ARE APPROXIMATE.

PROFILE SCALE

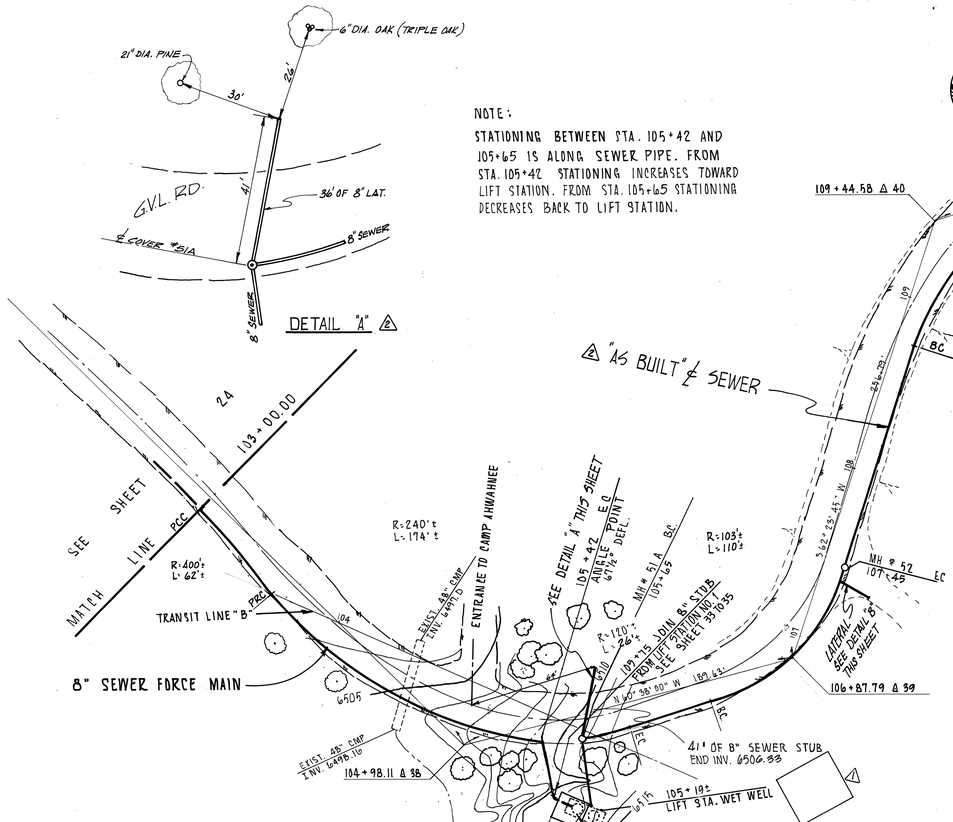
1" = 40' HORIZ.
1" = 8' VERT.

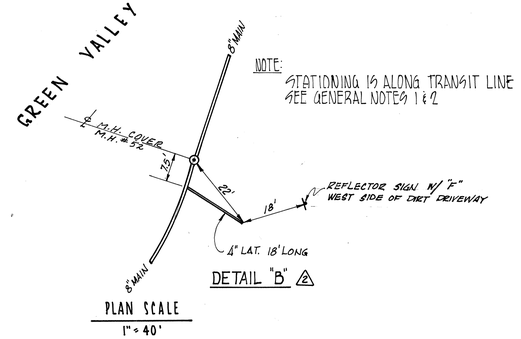
BENCH MARK

ELEV. 6576.95'
BOLT & PIKE IN P.P. # (NO NUMBERS) 25' LT. OF STA. 114+75

NOTE:

STATIONING BETWEEN STA. 105+42 AND 105+65 IS ALONG SEWER PIPE. FROM STA. 105+42 STATIONING INCREASES TOWARD LIFT STATION. FROM STA. 105+65 STATIONING DECREASES BACK TO LIFT STATION.





REV	DATE	BY	DESCRIPTION
1	8/76	H.N.	Added Lateral & Bldg.
2	12/77	J.D.	PLAN - "AS BUILT" ALIGNMENT PLOTTED, STA. 103+00.00 TO STA. 105+65.5 & DETAIL "A" ADDED.
3	12/77	J.D.	PROFILE - "AS BUILT" LOCATION OF M.H. # 53, 52, 58, 54 & ADDED NOTE.

SCALE: AS SHOWN

DESIGNED G.W. ATKINS
DRAWN M.R. GORES
CHECKED D.R. ALLISON

SUBMITTED Donald L. Allison PROJECT ENGINEER — R.E. NO. 10466 — DATE 4-1-74

RECOMMENDED Richard S. Titus PROJECT MANAGER — R.E. NO. 8605 — DATE 4-1-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

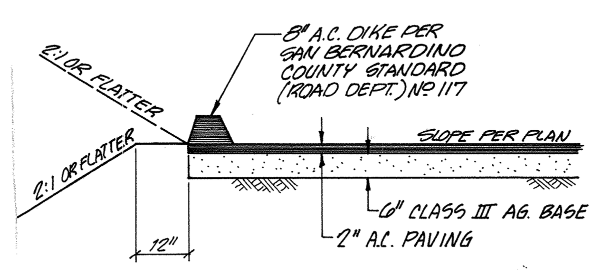
APPROVED Addy M. Powell — DATE 5-21-74

APPROVED R. R. Reid — DATE 5-21-74

INTERCEPTOR

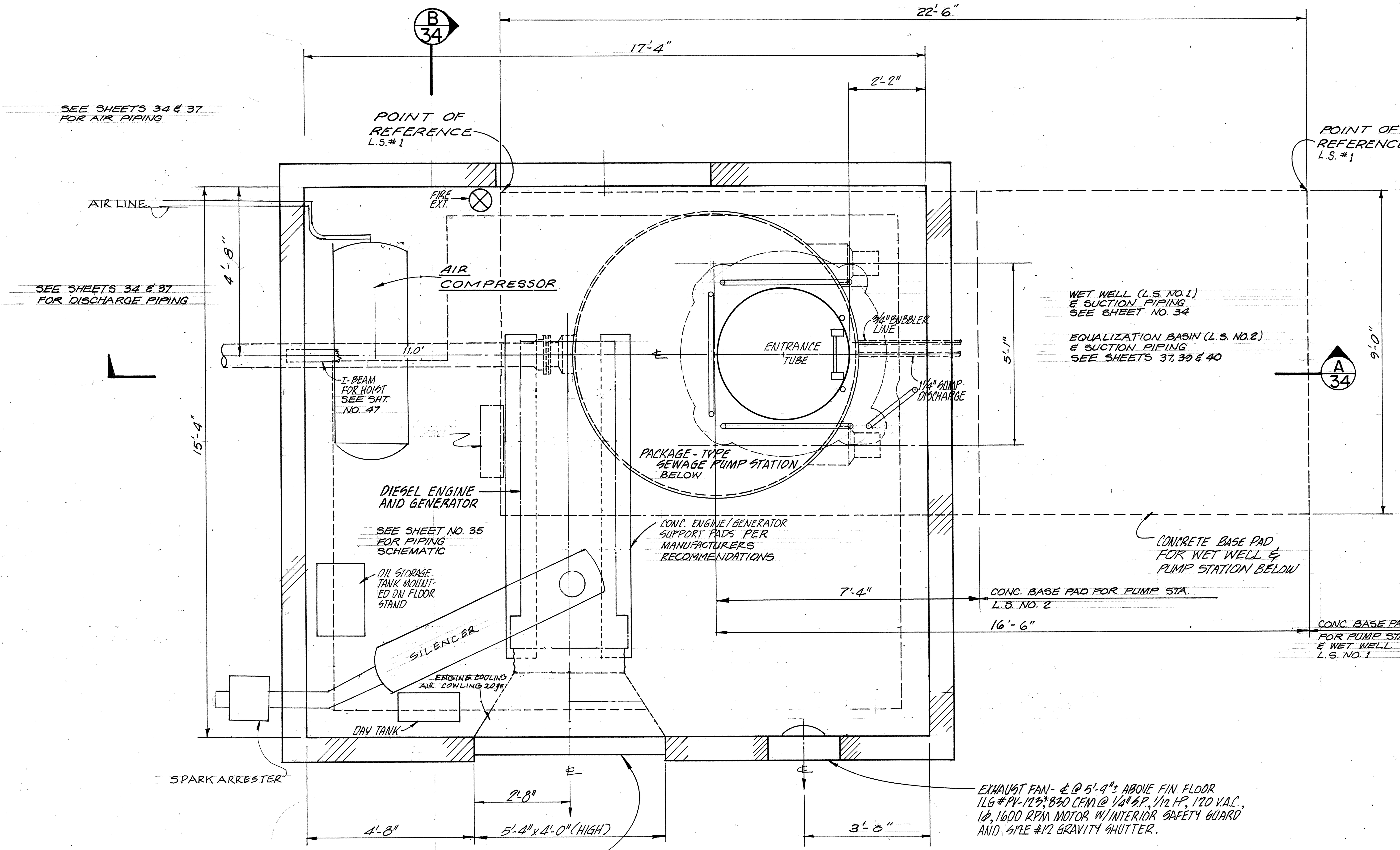
PLAN AND PROFILE
GREEN VALLEY LAKE ROAD
STA. 103+00 to STA. 114+00

SHEET 25 OF 48



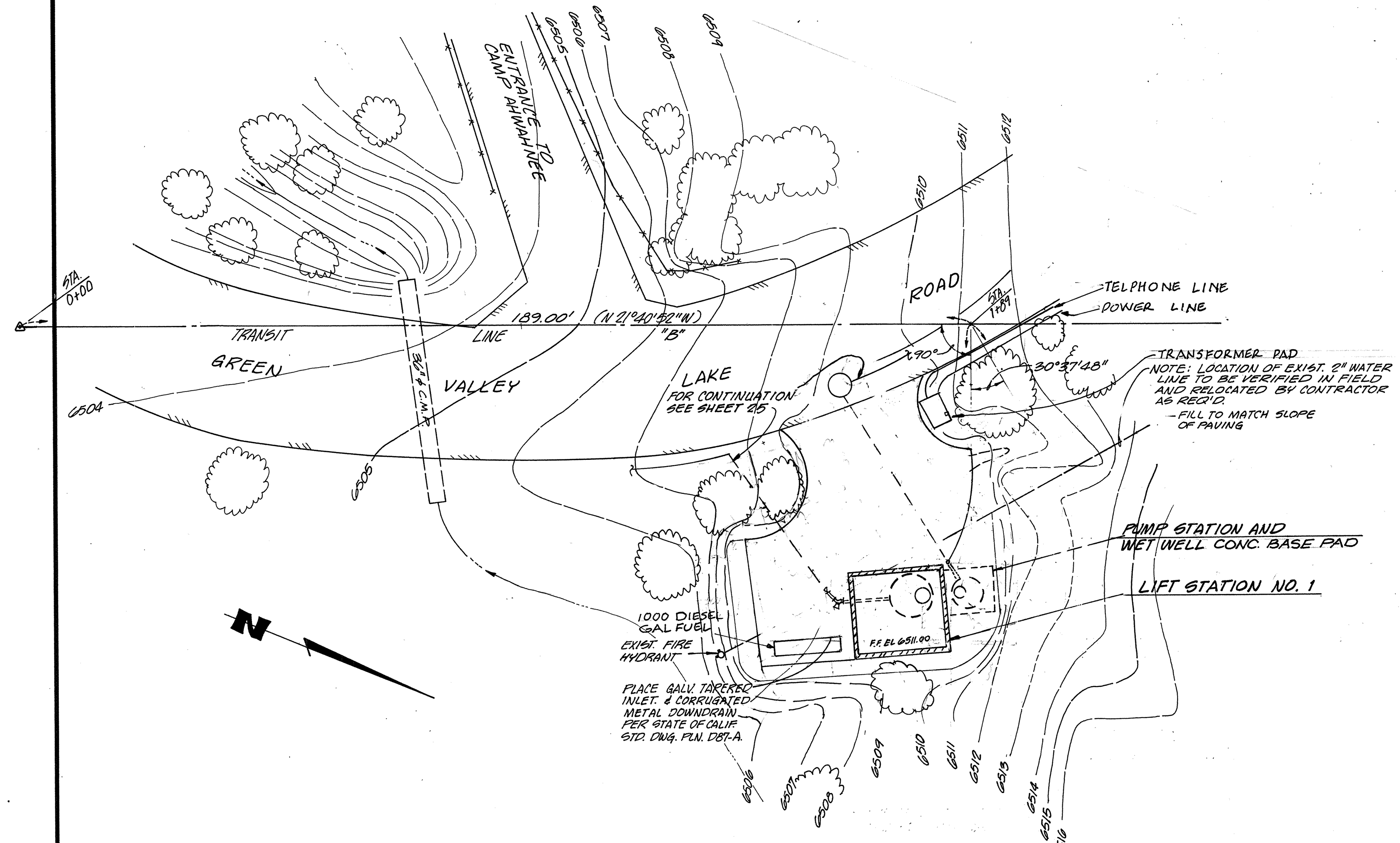
PAVING DETAIL

N.T.S.



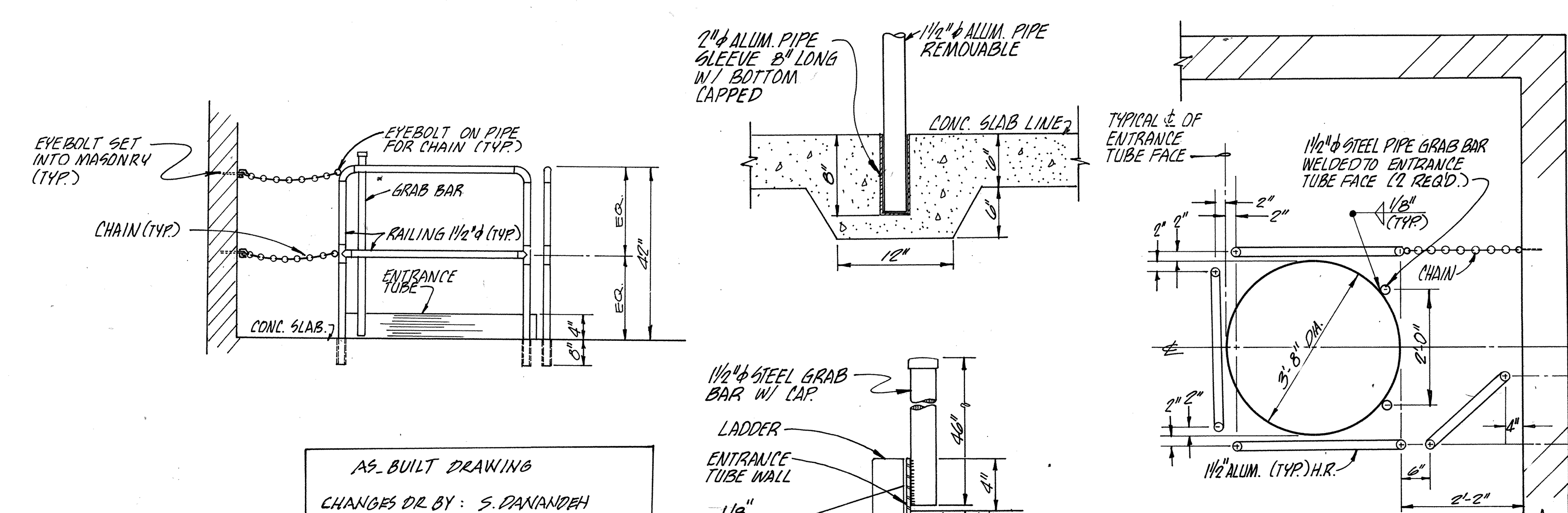
SETTING PLAN

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



SITE PLAN

SCALE 1"=20'



HANDRAIL DETAILS

N.T.S.

AS-BUILT DRAWING
CHANGES DR BY: S. DANANDEH
APPROVED
ENGINEER OF WORK

REV	DATE	BY	DESCRIPTION
△	9/3/76	G.C.C.	REVISED SETTING PLAN TO ACCOMODATE L.S. 1 & 2

SCALE: AS NOTED

DESIGNED R.C.G.
DRAWN C.L.
CHECKED R.C.G.

VTN ENGINEERS ARCHITECTS PLANNERS, SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Robert C. Gumerman, PROJECT ENGINEER, C-20805 R.E. NO., 4-1-74 DATE

RECOMMENDED Richard S. Titera, PROJECT MANAGER, C-8605 R.E. NO., 4-1-74 DATE

APPROVED Ashley M Powell DATE 5-21-74

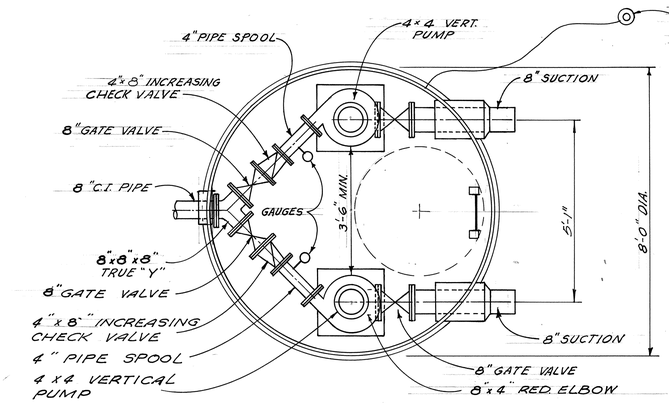
APPROVED A R Reid DATE 5-21-74

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

INTERCEPTOR

LIFT STATION NO. 1 SITE PLAN
LIFT STATION NO. 1&2 SETTING PLAN

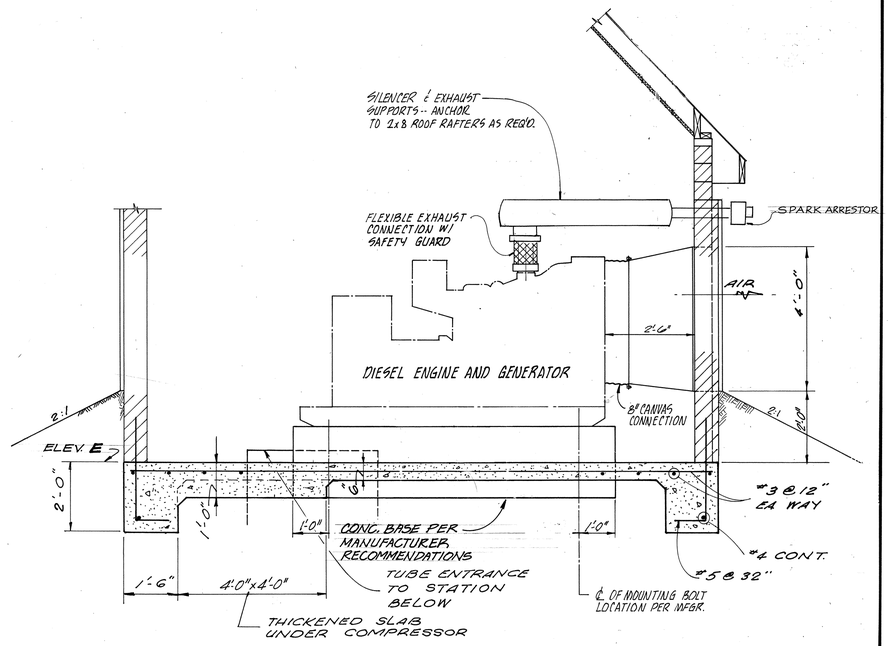
SHEET 33 OF 48



STATION PLAN

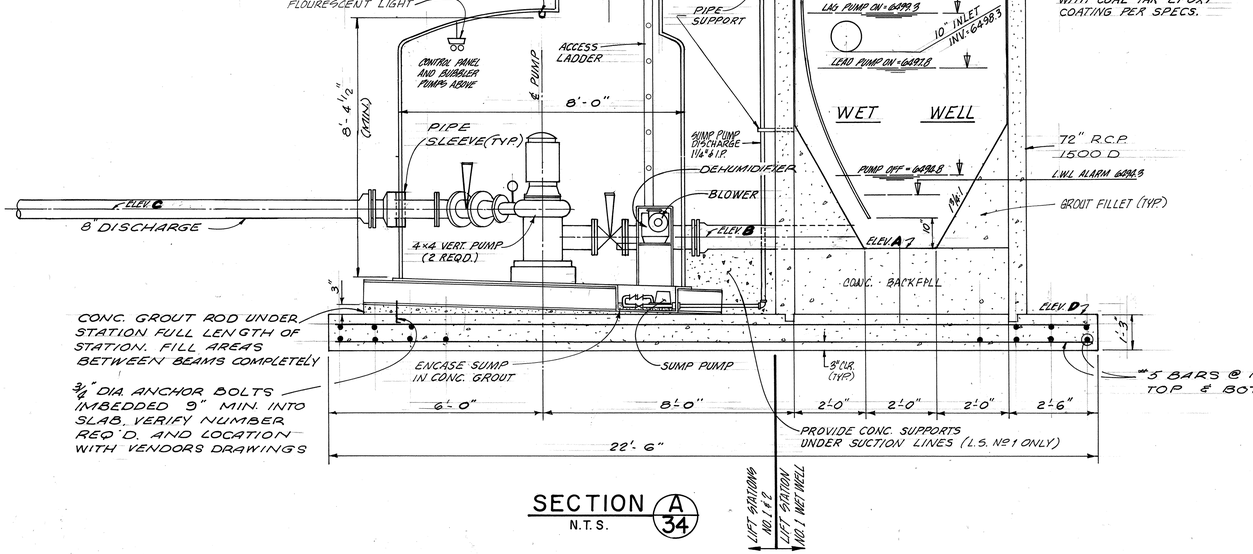
N.T.S.

LIFT STATION SCHEDULE			
ITEM	DESCRIPTION	L.S. NO. 1	L.S. NO. 2
	PUMPS - DISCHARGE Q	2 @ 960 GPM EA.	2 @ 200 GPM EA.
	TOTAL DYNAMIC HEAD	130 FT.	155 FT.
	MOTORS	2 @ 50 H.P. EA	2 @ 10 H.P. EA.
A	ELEV. @ SUCTION INVERT	6492.80	5930.93
B	ELEV. @ ℄ SUCTION	6499.13	5930.06
C	ELEV. @ ℄ DISCHARGE	6498.6±	5998.13
D	ELEV. @ TOP OF PAD	6491.33	5934.58
E	ELEV. @ FINISH FLOOR	6511.0	5991.0



SECTION (B 34)

1/2" = 1'-0"

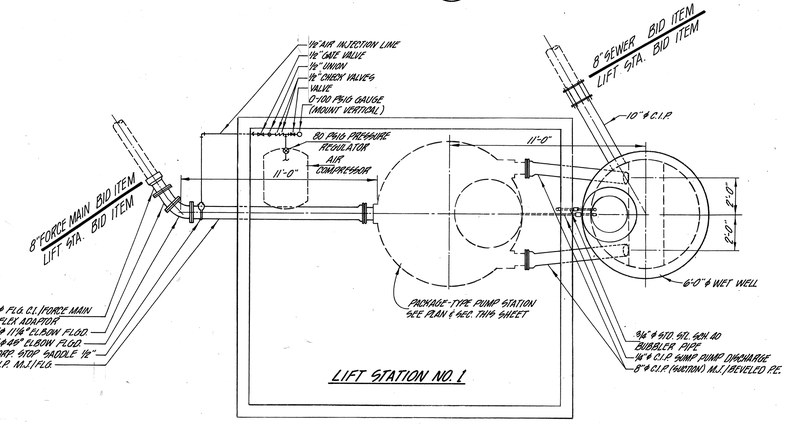


SECTION (A 34)

N.T.S.

SECTION (B 34)

1/2" = 1'-0"



PIPING PLAN

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

AS-BUILT DRAWING
CHANGES DR BY: S. DANANDEH
APPROVED :
ENGINEER OF WORKS

REV	DATE	BY	DESCRIPTION
1	9/76	G.D.C.	INCREASED WET WELL SIZE, REVISED SHEET TO ACCOMODATE LIFT STATIONS NO. 1 & 2

SCALE: AS NOTED

DESIGNED R.C.G.
DRAWN C.L.
CHECKED R.C.G.

VTN ENGINEERS ARCHITECTS PLANNERS , SAN BERNARDINO, CALIFORNIA 92401 PHONE (714) 889-4431

SUBMITTED Robert C. Germanman PROJECT ENGINEER C-20805 R.E. NO. 4-1-74 DATE

RECOMMENDED Roland S. Titus PROJECT MANAGER C-8605 R.E. NO. 4-1-74 DATE

COUNTY SERVICE AREA NO. 79 — GREEN VALLEY LAKE

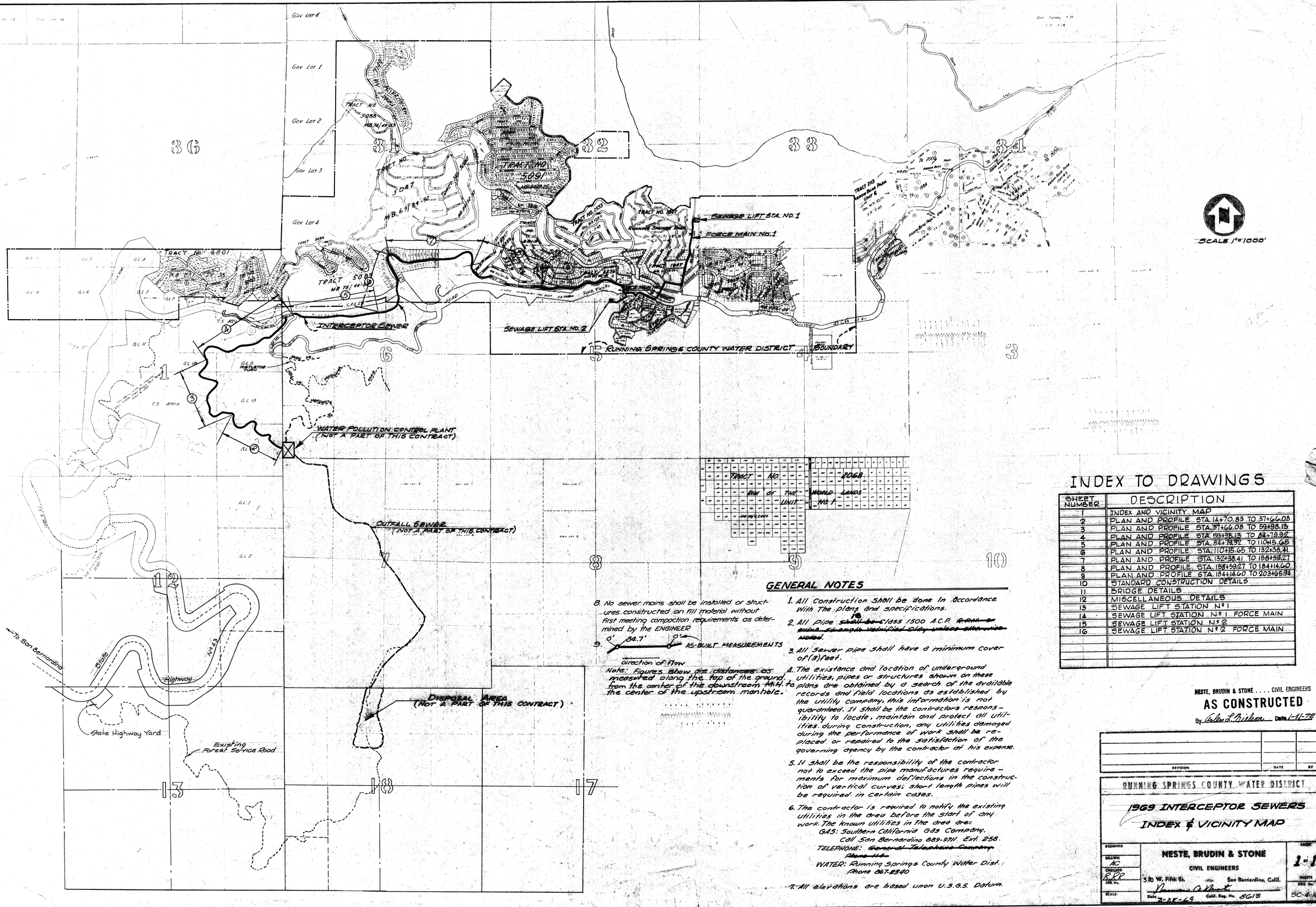
APPROVED Bobby M. Powell DATE 5-21-74

APPROVED C.R. Reid DATE 5-21-74

INTERCEPTOR

LIFT STATION NO. 1 & 2 STATION PLAN AND ELEVATIONS
LIFT STATION NO. 1 WET WELL AND PIPING PLAN

SHEET 34 OF 48



GENERAL NOTES

1. All Construction shall be done in accordance With The plans and specifications.
2. All pipe ~~shall be~~ Class 1500 A.C.P. ~~R-SDR or equal Strength Vitrified Clay unless otherwise noted.~~
3. All sewer pipe shall have a minimum cover of (3) feet.
4. The existance and location of underground utilities, pipes or structures shown on these plans are obtained by a search of the available records and field locations as established by the utility company. this information is not guaranteed. It shall be the contractors responsibility to locate, maintain and protect all utilities during construction, any utilities damaged during the performance of work shall be replaced or repaired to the satisfaction of the governing agency by the contractor at his expense.
5. It shall be the responsibility of the contractor not to exceed the pipe manufactures requirements for maximum deflections in the construction of vertical curves; short length pipes will be required in certain cases.
6. The contractor is required to notify the existing utilities in the area before the start of any work. The known utilities in the area are:
   GAS: Southern California Gas Company.
   Call San Bernardino 889-9711 Ext. 258.
   TELEPHONE: ~~General Telephone Company Phone No.~~
   WATER: Running Springs County Water Dist. Phone 867-2340
7. All elevations are based upon U.S.G.S. Datum.
8. No sewer mains shall be installed or structures constructed on fill material without first meeting compaction requirements as determined by the ENGINEER
9. 0' 84.7' 0' AS-BUILT MEASUREMENTS
   Direction of Flow
   Note: Figures shown are distances as measured along the top of the ground from the center of the downstream MH. to the center of the upstream manhole.

INDEX TO DRAWINGS

SHEET NUMBER	DESCRIPTION
1	INDEX AND VICINITY MAP
2	PLAN AND PROFILE STA. 14+70.83 TO 37+66.08
3	PLAN AND PROFILE STA. 37+66.08 TO 59+98.13
4	PLAN AND PROFILE STA. 59+98.13 TO 84+79.92
5	PLAN AND PROFILE STA. 84+79.92 TO 110+15.65
6	PLAN AND PROFILE STA. 110+15.65 TO 132+38.41
7	PLAN AND PROFILE STA. 132+38.41 TO 158+59.27
8	PLAN AND PROFILE STA. 158+59.27 TO 184+14.60
9	PLAN AND PROFILE STA. 184+14.60 TO 203+05.94
10	STANDARD CONSTRUCTION DETAILS
11	BRIDGE DETAILS
12	MISCELLANEOUS DETAILS
13	SEWAGE LIFT STATION Nº 1
14	SEWAGE LIFT STATION Nº 1 FORCE MAIN
15	SEWAGE LIFT STATION Nº 2
16	SEWAGE LIFT STATION Nº 2 FORCE MAIN

NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Calen L. Brisbin Date 1-11-72

REVISION	DATE	BY

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS

INDEX & VICINITY MAP

DESIGNED
DRAWN AC
CHECKED RRP
JOB No.
SCALE:

NESTE, BRUDIN & STONE
CIVIL ENGINEERS
330 W. Fifth St. San Bernardino, Calif.
Date 2-28-69 Calif. Reg. No. 8618

SHEET 1-16
SHEETS
DRG. No. SC-4-181

NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Arlen L. Nilson Date 1-11-72

Revision	Date	By
△ Add Bench Mark	7-9-69	G.E.C.

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS

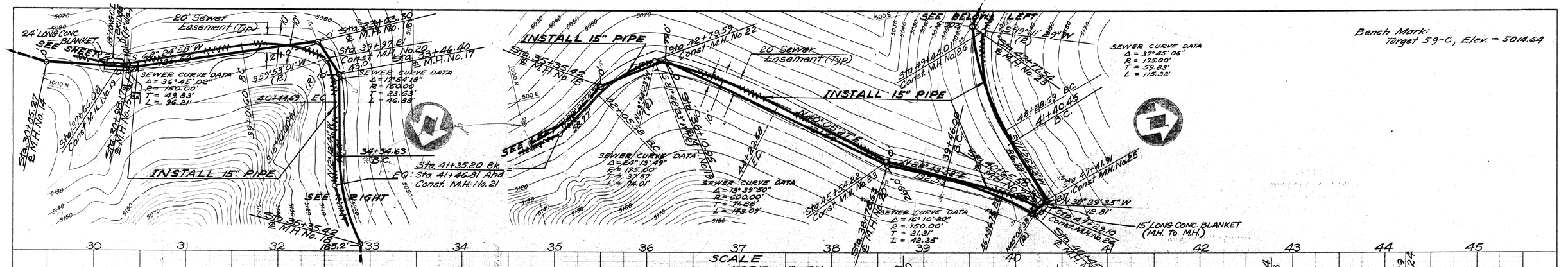
STA. 10+00 TO STA. 30+98.17

Designed ALN
Drawn CARRYER
Checked R.R.R.
Job No. 59-50.06
Scale As Shown

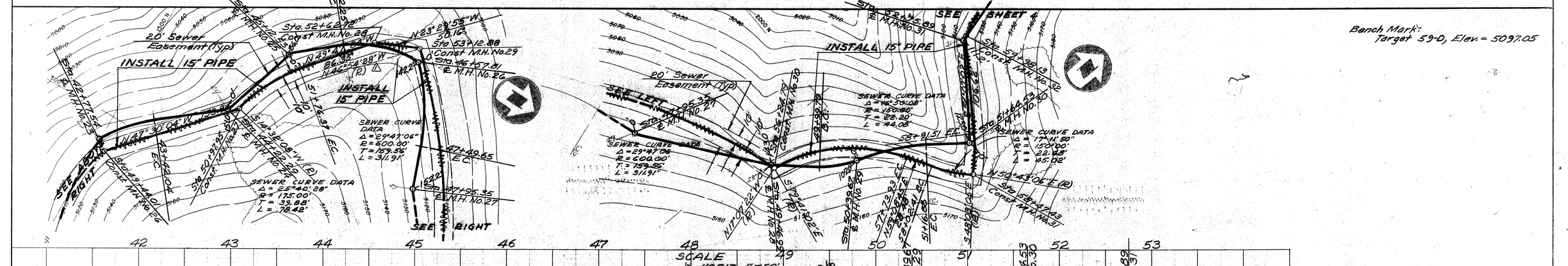
NESTE, BRUDIN & STONE
CIVIL ENGINEERS
350 West Fifth Street San Bernardino, Calif.
Date 2-28-69 Calif. Reg. No. RCE 8613

Sheet 2 of 16 Sheets
DRG. NO. SC-4-181

Bench Mark:
Target 59-C, Elev. = 5014.64



Bench Mark:
Target 59-D, Elev. = 5097.05



NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Arden L. Nielsen Date 1-11-72

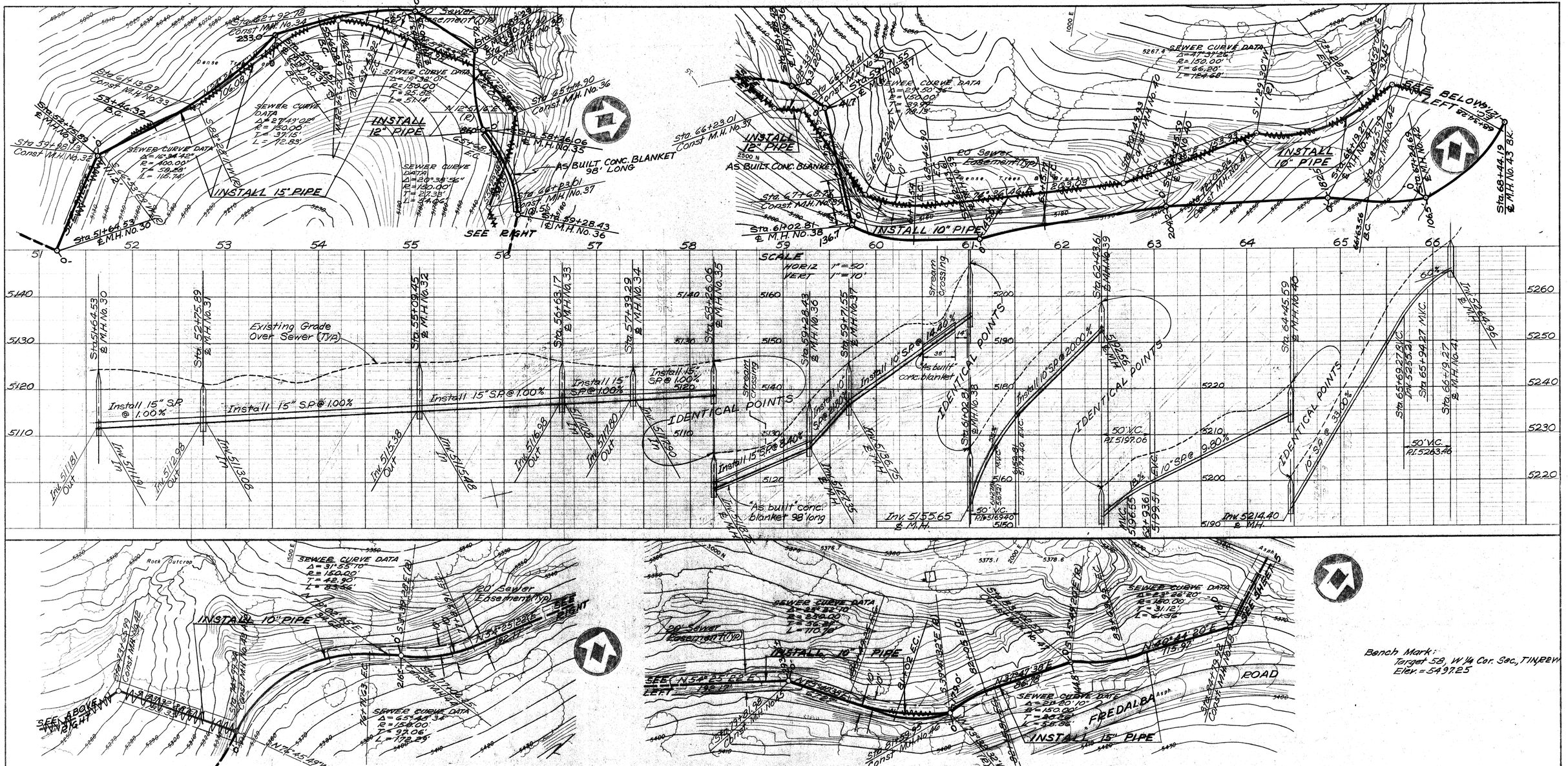
Revision	Date	By
Δ Add Bench Mark	7-9-69	G.E.C.
Δ Changed Rod Bearing M.H. 29	6-28-69	A.L.N.

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS

STA. 30+98.17 To STA. 52+75.89

Designed ALN	NESTE, BRUDIN & STONE	Sheet 3 of 16
Drawn CAREYER	CIVIL ENGINEERS	Sheets
Checked R.R.R.	350 West Fifth Street San Bernardino, Calif.	
Job No. 59-50.06	Date 2-27-69 Calif. Reg. No. RCE 8613	DRG. NO. SC-4-181
Scale As Shown		



NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Calvin L. Nielsen Date 1-11-72

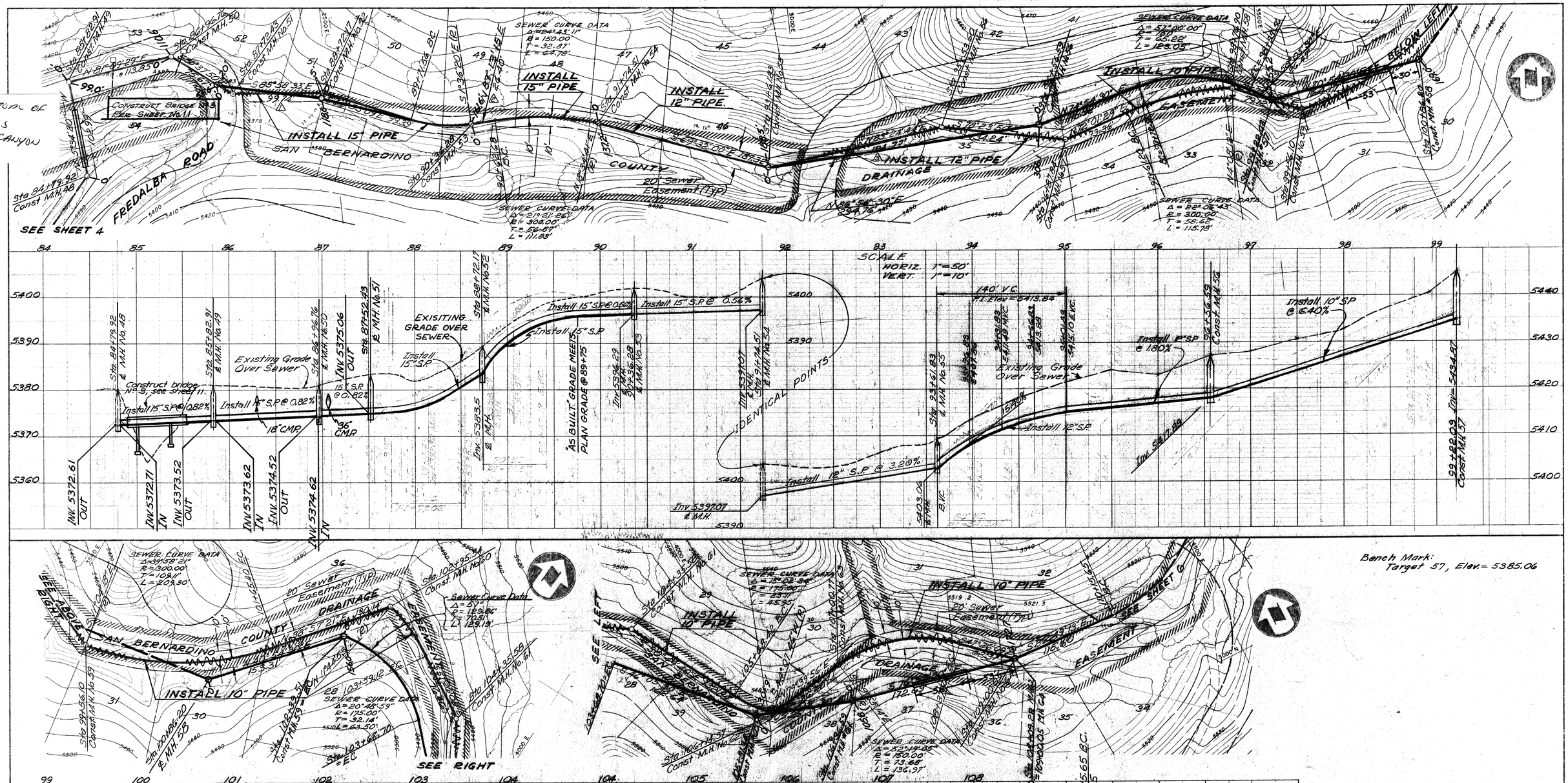
⚠ Add Bench Mark		7-9-69	G.E.C.
Revision		Date	By

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS

STA. 51+64.53 TO STA. 84+79.92

Designed	ALN	NESTE, BRUDIN & STONE	Sheet 4 of 16
Drawn	CABEYER	CIVIL ENGINEERS	Sheets
Checked	R.R.R.	350 West Fifth Street San Bernardino, Calif.	DRG. NO.
Job No.	59-50.06		SC-4-181
Scale	As Shown	Date 2-24-69 Calif. Reg. No. RCE 8613	



NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Arlen L. Neste Date 6-11-72

Revision	Date	By
Add Bench Mark	7-9-69	G.E.C.
Changed Distance M.H. 55 to 56	6-28-69	A.L.N.
Changed Bearing M.H. 53 to B.C.	6-28-69	A.L.N.
Changed Bearing M.H. 51-52	6-28-69	A.L.N.

RUNNING SPRINGS COUNTY WATER DISTRICT

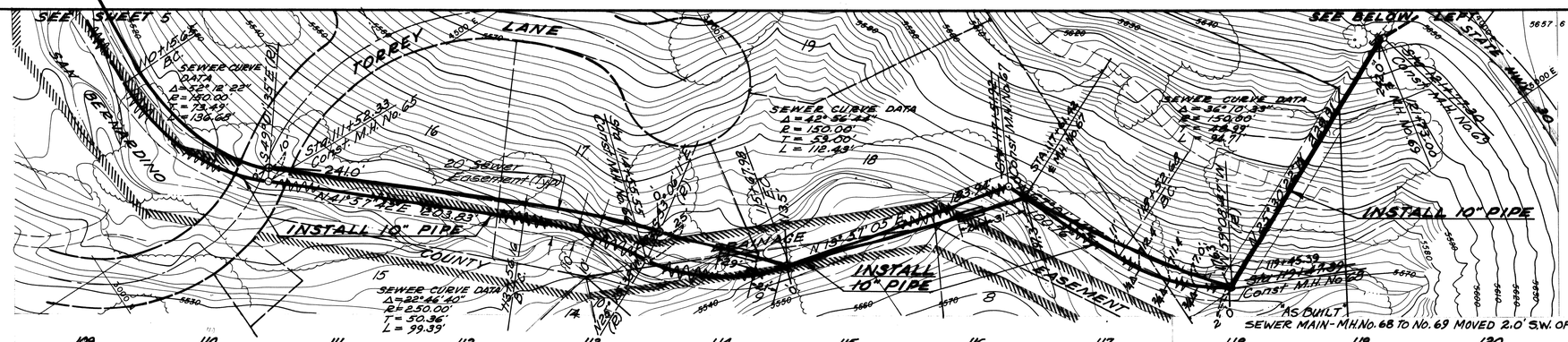
1969 INTERCEPTOR SEWERS

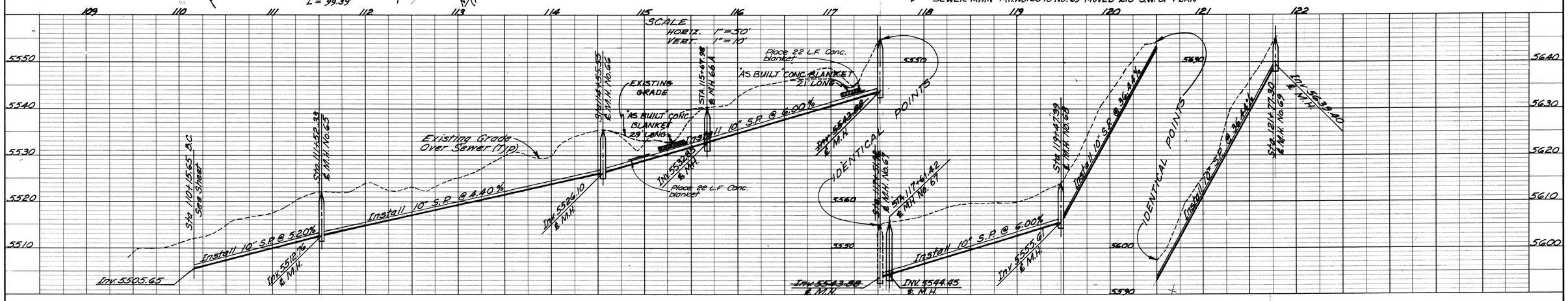
STA. 84+79.92 To STA. 108+09.28 Bk.
109+00.05 Ahd.

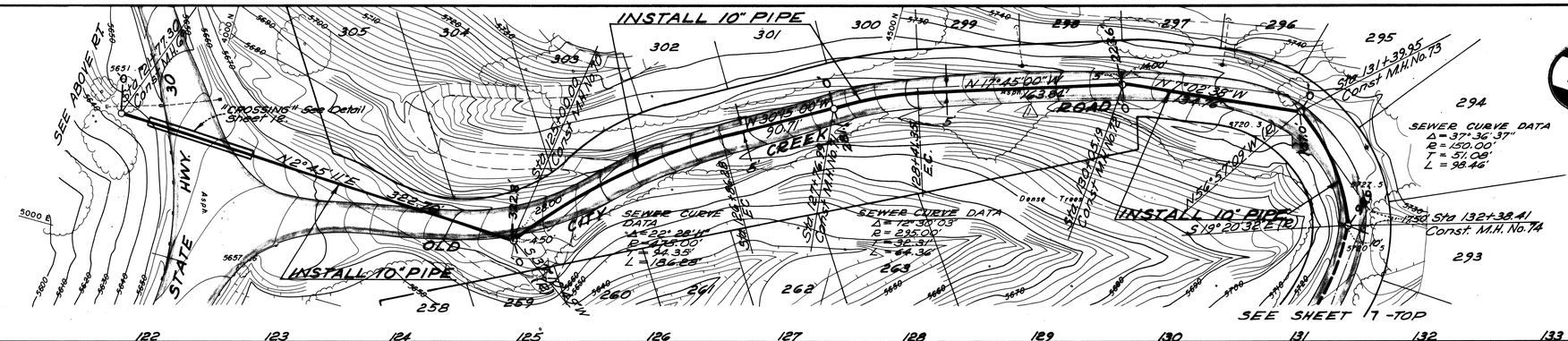
Designed	ALN
Drawn	CARRYER
Checked	R.R.R.
Job No	59-50.06
Scale	As Shown

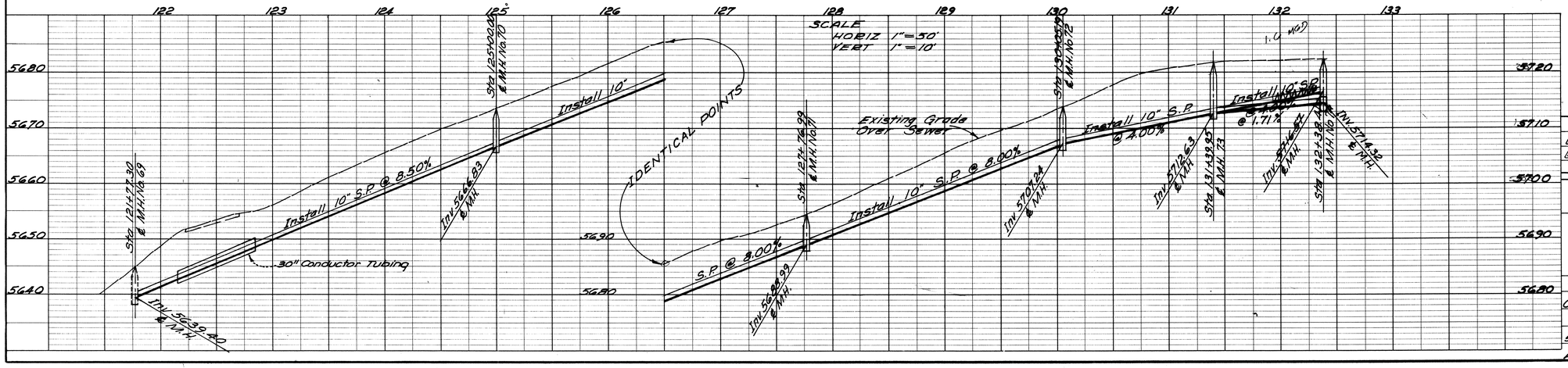
NESTE, BRUDIN & STONE
CIVIL ENGINEERS
350 West Fifth Street San Bernardino, Calif
Date 2-28-67 Calif. Reg. No. RCE 8613

Sheet 5 of 16 Sheets
DRG. NO. SC-4-131









NESTE, BRUDIN & STONE .... CIVIL ENGINEERS

AS CONSTRUCTED

By Calvin L. Tidlow Date 1-11-72

Revision	Date	By
⚠ Add Bench Mark	7-9-69	
⚠ Changed Distance M.H. 71-72	6-28-69	A.L.N.

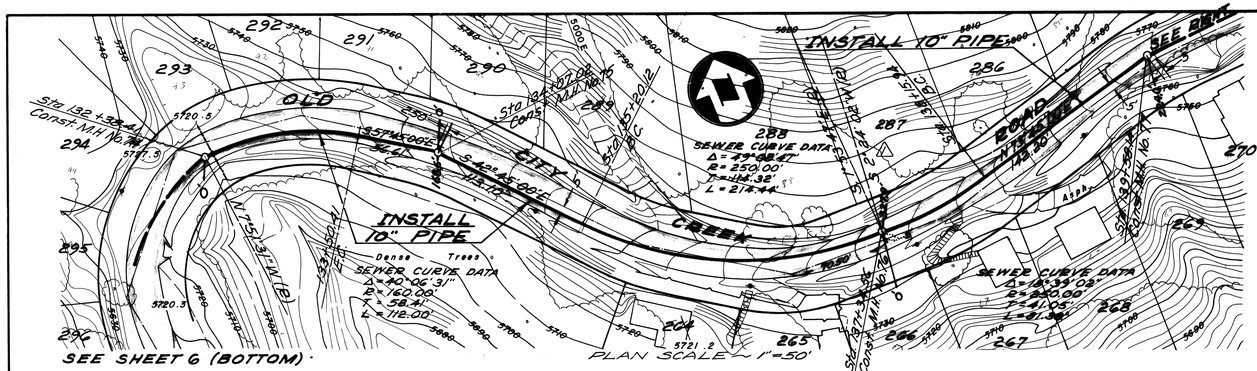
RUNNING SPRINGS COUNTY WATER DISTRICT

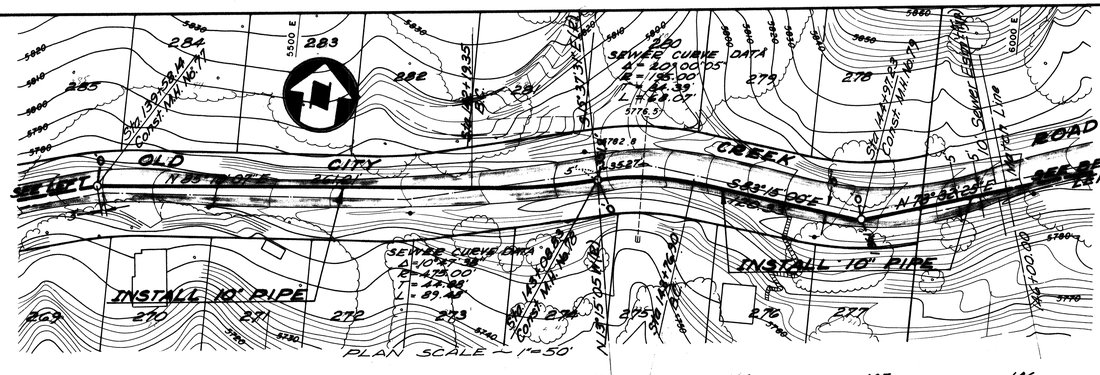
1969 INTERCEPTOR SEWERS
OLD CITY CREEK ROAD
STA. 110+15.65 To STA. 132+38.41

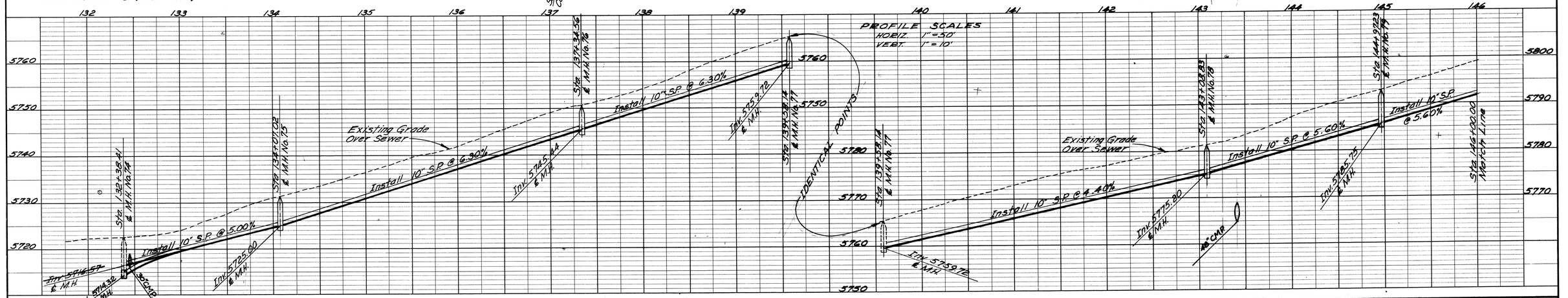
Designed	ALN
Drawn	CAREYEE
Checked	R.E.B.
Job No.	59-50.06
Scale	As Shown

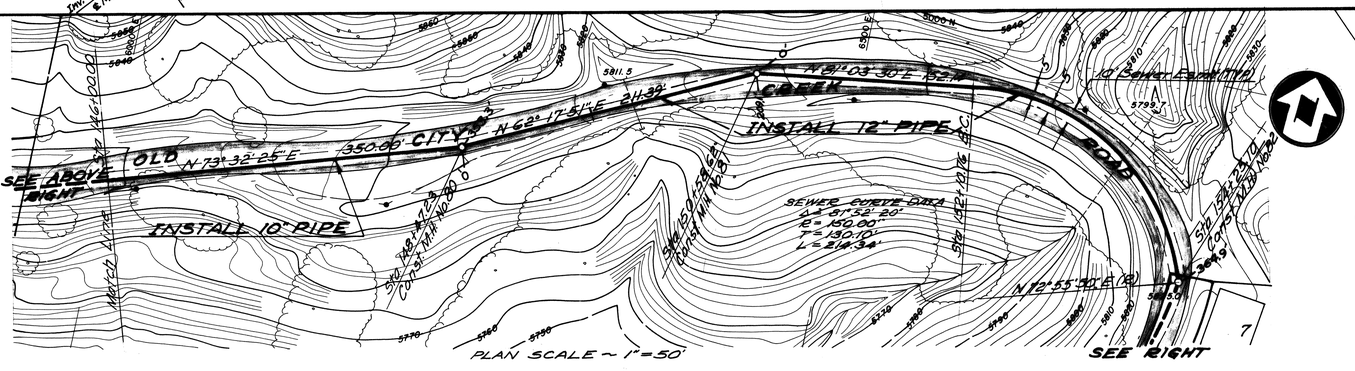
NESTE, BRUDIN & STONE
CIVIL ENGINEERS
350 West Fifth Street San Bernardino, Calif.
Date 2-28-69 Calif. Reg. No. R.C.E. 26613

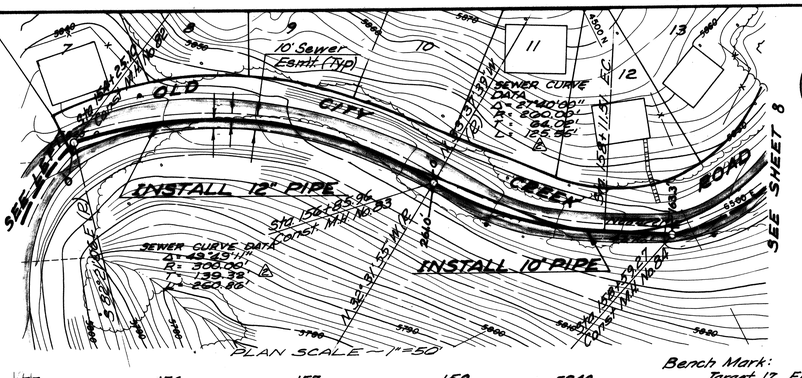
Sheet 6 of 16 Sheets
DRG. NO. SC-4-181

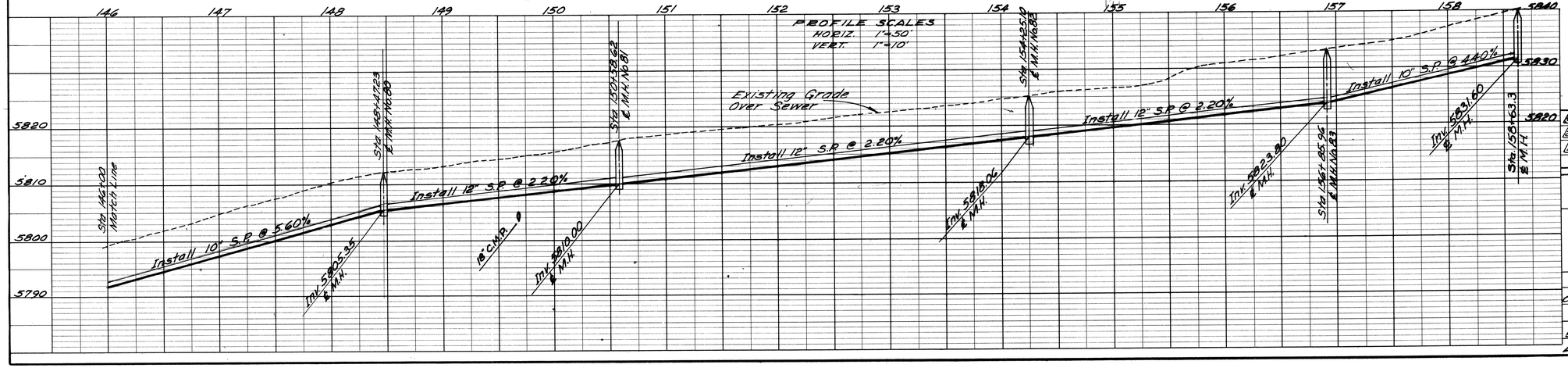












Bench Mark:
Target 17, Elev. = 5667.7
Target 19, Elev. = 5790.8
Target 20 Elev. = 5843.01

NESTE, BRUDIN & STONE . . . . CIVIL ENGINEERS

AS CONSTRUCTED

By Calvin L. Nielsen Date 1-11-72

Revision	Date	By
⚠ Add Bench Mark	7-9-69	G.E.C.
⚠ Added curve data	6-28-69	A.L.N.
⚠ Corrected Rad. Bearing MH 76	6-28-69	A.L.N.

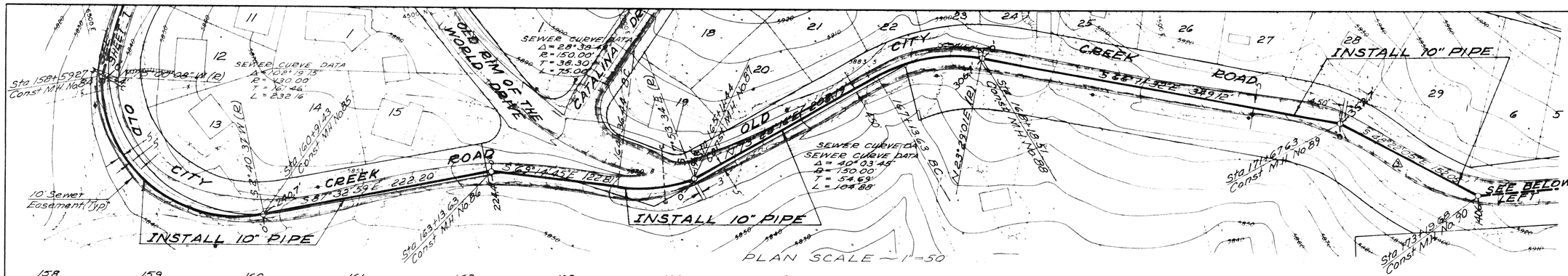
RUNNING SPRINGS COUNTY WATER DISTRICT

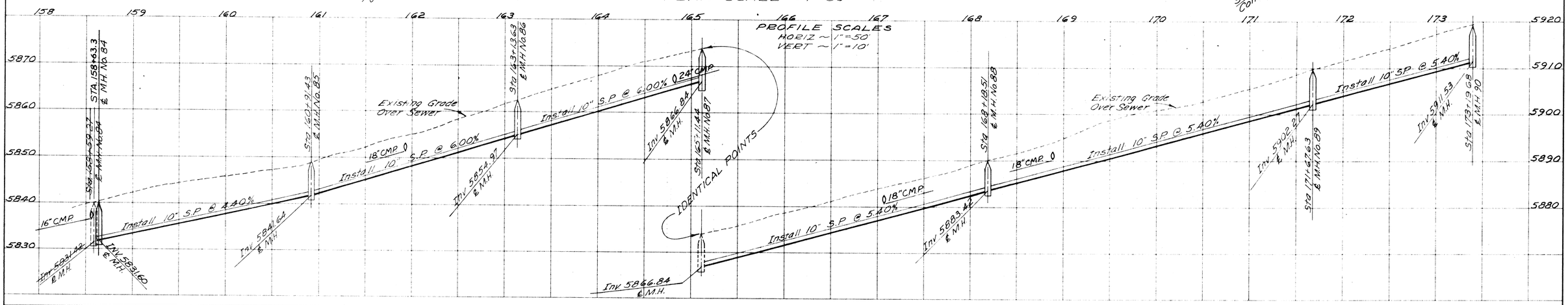
1969 INTERCEPTOR SEWERS
OLD CITY CREEK ROAD
STA. 132+38.41 To STA. 158+63.3

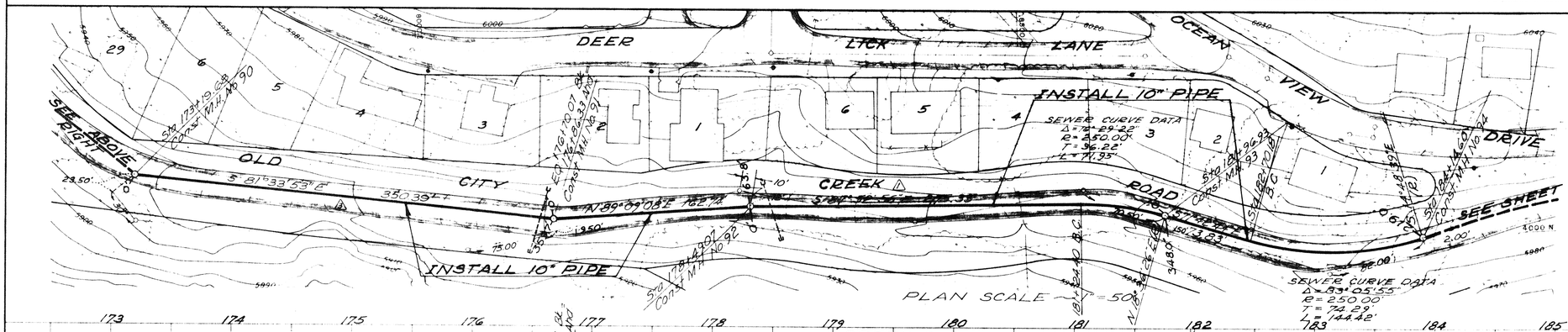
Designed	A.L.N.
Drawn	CABBEYEE
Checked	K.W.P.
Job No.	69-50.06
Scale	AS Shown

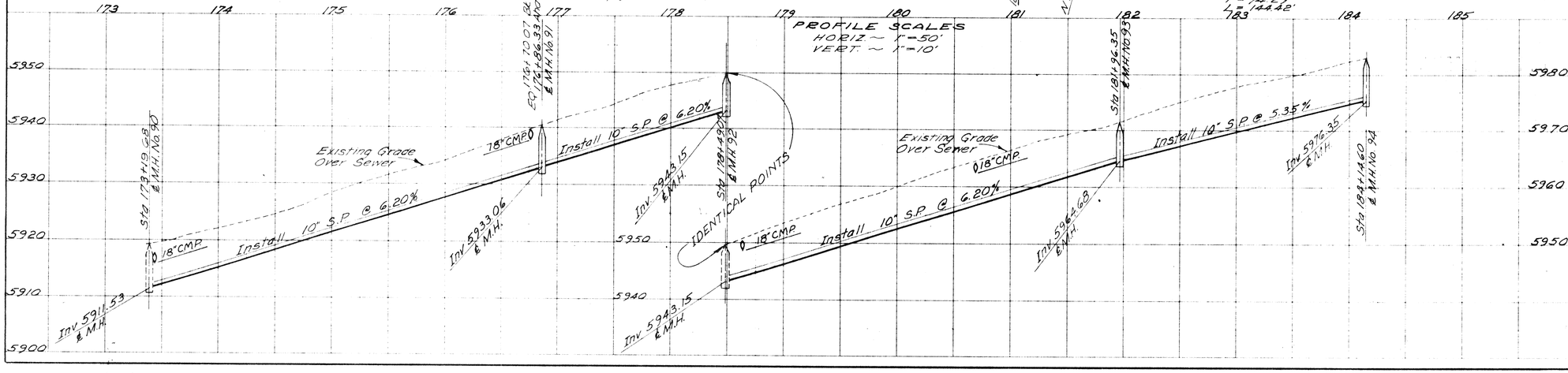
NESTE, BRUDIN & STONE
CIVIL ENGINEERS
350 West Fifth Street San Bernardino, Calif.
Date 2-28-69 Calif. Reg. No. RCE 8613

Sheet 7 of 16 Sheets
DRG. NO. SC-4-181









Bench Mark
Target 21, Elev. 5874.7
Target 22, Elev. 5977.20

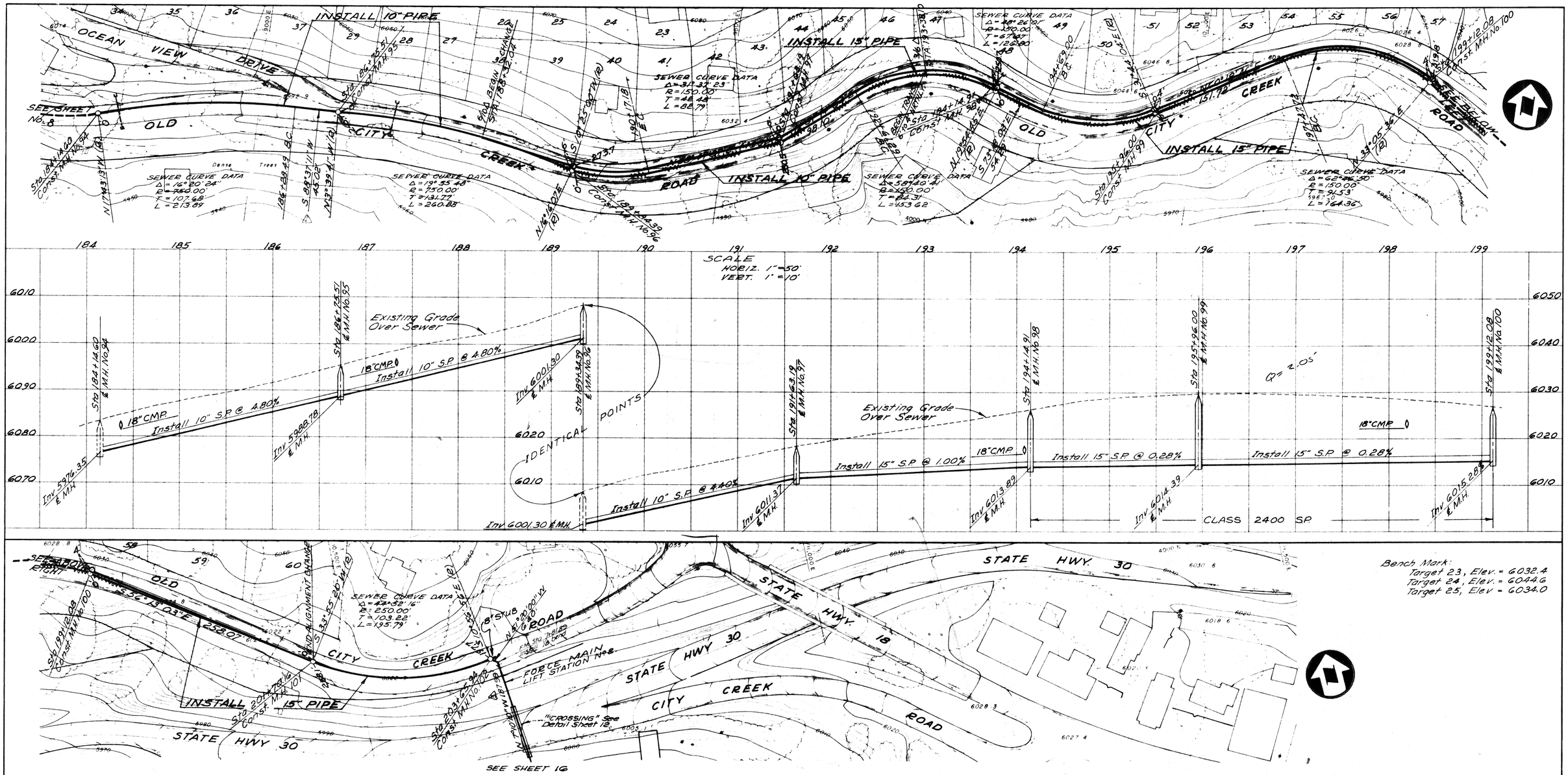
Calvin L. Nielsen 1-11-72

Δ Corrected Alignment	7-23-69	A.L.N.
Δ Add Bench Mark	7-9-69	G.E.C.
Δ Corrected Bearing	6-28-69	A.L.N.
Revision	Date	By

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS
OLD CITY CREEK ROAD
STA 158+59.27 TO STA. 184+14.60

Drawn: A.L.N.	NESTE, BRUDIN & STONE	Sheet 8 of 16
Traced: CARREYER	CIVIL ENGINEERS	
Checked: K.F.K.	San Bernardino, Calif.	Sheets
Job No. 59-3006	Donna C. Neste Cert. Reg. No. RCE 8613	Dwg. No. SC-4-181
Date: As Shown	Date: 2-27-69	



Nestle Brudin & Stone

Arlen L. Nielson 1-11-72

3	Corrected Distance	7-23-69	ALN
2	Add Bench Mark	7-9-69	GEC
1	Corrected Bearing M.H. 95	6-28-69	ALN
	Revision	Date	By

RUNNING SPRINGS COUNTY WATER DISTRICT

1969 INTERCEPTOR SEWERS
OLD CITY CREEK ROAD
STA. 184+14.60 TO STA. 203+65.94

Drawn ALN	NESTE, BRUDIN & STONE	Sheet 9 of 16 Sheets
Checked CARRYER	CIVIL ENGINEERS	
Job 59-50.06	301 West 6th Street San Bernardino, Calif.	DRG NO. SC-4-181
Date AS SHOWN	Calif. Reg. No. RCE 8613 Date 2-8-69	

APPENDIX B

County of San Bernadino Standards for Sanitary Sewer (2012) Division C

COUNTY OF SAN BERNARDINO
SPECIAL DISTRICTS DEPARTMENT

STANDARDS FOR SANITARY SEWER

DIVISION "C"
DESIGN CRITERIA AND PLAN PREPARATION

DIVISION "D"
GENERAL CONDITIONS
TECHNICAL SPECIFICATIONS

DIVISION "E"
STANDARD DRAWINGS

November 13, 2012

COUNTY OF SAN BERNARDINO
SPECIAL DISTRICTS DEPARTMENT

STANDARDS FOR SANITARY SEWERS

BOARD OF SUPERVISORS

Gary Ovitt, Chairman
Brad Mitzelfelt
Josie Gonzales
Neil Derry
Paul Biane

_____
Board of Supervisors

SPECIAL DISTRICTS DEPARTMENT

Review by Special Districts Department of the Environmental Improvement Agency, County of San Bernardino

_____
Special Districts Department

Approved as to form this _____ day of _____, 2009

County Counsel _____
Deputy County Counsel

August 13, 2012

COUNTY OF SAN BERNARDINO
SPECIAL DISTRICTS DEPARTMENT

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DESIGN CRITERIA AND
PLAN PREPARATION SEWERS

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1.3	Over Sizing Required by District -	C-3
1.4	Manholes and Cleanouts - -	C-3
1.5	Sewage Lift Stations - -	C-4
1.6	Plan Preparation - - -	C-5
1.7	Technical Specifications - -	C-5
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COUNTY OF SAN BERNARDINO
SPECIAL DISTRICTS DEPARTMENT

DESIGN CRITERIA AND PLAN PREPARATION
SEWERS

The following requirements pertain to the design and preparation of plans for construction of the various components to the sewerage system.

1.1 GENERAL

1.1.01 Scope. - All sewers, sewage lift stations, treatment facilities and appurtenances to be owned, maintained and/or operated by the District shall be designed according to the criteria set forth in this section. **The same criteria shall hold for systems served but not owned, maintained and/or operated by the District insofar as said criteria may affect the efficiency of the District's system**. All additions to the District's system shall be plan checked and inspected by the District.

1.1.02 Design Competence. - All District facilities shall be designed by professional engineers according to accepted practice in the sewerage field. The design engineer shall arrange for a pre-design meeting with the District Engineer to review the proposed project.

1.1.03 Sewage Lift Stations and Inverted Siphons. - Every effort should be made, within economic reason, to avoid sewage lift stations, inverted siphons and exposed piping, Their use will be allowed only upon approval by the District.

1.1.04 Legal Access. - Each lot to be served by sewer shall abut a public street or sewer, shall abut a public street or recorded easement containing a sewer, or be provided with permanent legal access to such a sewer. The easement shall be clear of permanent structures, such as building eaves, roof lines, and large trees. Temporary construction easements of adequate size shall also be provided. The location of the street, easement, or legal access shall permit gravity flow from the lot to the sewer main. Deviations from any of the criteria adopted herein may be permitted upon written request to and approval by the District.

1.2 SEWERS AND APPURTENANCES.

1.2.01 Flows. - The flow used for the design capacity for sewers and sewage lift stations shall be the "computed peak flow," which shall be determined on the basis of projected land use and average daily flow per capita for the various geographical areas as follows:

Mountain Areas	80 gpcd
Valley and Desert Areas	100 gpcd

Sewer flows shall be computed from projected land use and population density over the area tributary to the sewer reach under consideration. The following peaking factors shall be applied to the sewer flows as determined above:

Average Flow (mgd)	Peak Factor
0.0 - 0.01	4.0
0.05	3.4
0.10	3.2
0.20	3.0
0.30	2.8
0.50	2.7
0.8	2.6
1.0	2.5
1.5	2.4
2.5	2.3
4.0	2.2
6.0	2.1
10	2.0
15	1.9
30	1.8

Design flows from commercial, industrial, hotels, motels, campgrounds, etc., shall be determined in consultation with the District.

1.2.02 Formula. - Capacity of all sewers shall be determined by the use of the "Mannings" formula:

$$Q = A \frac{1{,}486}{n} r^{2/3} s^{1/2}$$

where: Q = flow capacity - cfs
n = coefficient of roughness 0.013
r = hydraulic radius
s = slope
A = cross sectional area

1.2.03 Roughness Coefficient. - The Roughness coefficient used in design shall be n = .013 for all sewers. If any manufacturer claims that the "n" factor of his pipe should be less, he must submit documented evidence to substantiate his claims. The reliability of such evidence shall be determined by the District.

1.2.04 Pipe Size. - All gravity feed sewer pipe up to and including eight (8) inch diameter shall be sized to carry the peak flow when fifty percent (50%) full. This requirement shall apply regardless of the cross section shape of the sewer. All larger sewer pipe, except those designed as laterals, shall be sized to carry the peak flow when seventy-five (75%) full. This requirement shall apply regardless of the cross-section of the sewer. No sewer main with an internal diameter less than eight (8) inches shall be installed without prior written approval of the District.

1.2.05 Sewer Slopes and Velocities. - The minimum allowable slope is that which will give a velocity of not less than two (2) feet per second when the sewer is flowing fifty percent (50%) full. The purpose of this requirement is to prevent sewage sedimentation and subsequent generation of corrosive gases. The velocity shall be determined by means of the "Mannings Formula."

$$V = \frac{1,486}{n} \; r^{2/3} \; s^{1/2}$$

In sewers of uniform size passing through manholes without a major change in direction or slope, there shall be no arbitrary drop between inlet and outlet. In sewers which change slope but do not change direction or size, the slopes of the incoming sewers shall be carried through to the outlet of the manhole. Where diameters change, and in junctions involving major direction or slope changes, the various elevations shall be chosen to match water surfaces under average flow conditions at ultimate development of the tributary area (not under maximum flow conditions).

1.2.06 Minimum Slopes. - The minimum slopes to be used with various pipe sizes are listed herein and shall be used when necessary to prevent long reaches of deep sewer mains. The design engineer shall strive for minimum slopes of 0.008 to 0.01 feet per foot in order to maintain a cleaning velocity.

Diameter inches	Minimum Slope Ft./Ft.
6	0.0060
8	0.0040
10	0.0029
12	0.0022
15	0.0016
18	0.0012
21	0.0010
24	0.0008

1.2 .07 Exceptions to Minimum Slopes. - Where topography limits or prevents the use of minimum slopes as described herein, the District may require an engineer's report. This report shall describe the alternatives and their economies. The report shall also include an evaluation of prospective maintenance and sewer gas problems. Greater minimum slope than those specified in Section 1.2.06 hereof may be required where the presence of hydrogen sulfide may be detrimental to and affect the life of the sewer pipe being used.

1.2.08 Slopes in Force Mains. - In force mains a continuous uphill slope shall be provided from the sources to the outlet. Combination air and vacuum valves shall be provided where high points cannot be avoided.

1.2.09 Location. - All sewer mains shall be located in public streets or recorded easements such that each lot within a development can be served by gravity flow, and the services shall be extended according the Standard Drawings No. E-9 and E-10.

1.2.10 Curved Sewers, - Curvilinear vertical and horizontal alignment on sewer mains for new developments shall be avoided unless approved by the District review. If curvilinear sewers are permitted the following conditions must be met:

(a) No more than one (1) horizontal circular curve and one (1) vertical curve shall be permitted between any two (2) manholes. The curve may be a combination horizontal and vertical, but in no instance may there be more than one (1) vertical and one (1) horizontal curve between two (2) manholes.

(b) At least one (1) end of the curve shall terminate in a manhole.

(c) No sewer on a curvilinear alignment shall be less than eight (8) inch diameter.

(d) The radius of curvature is not less than one hundred and twenty-five (125) feet. A shorter radius of curvature may be used upon approval of the District, where shorter than normal depth pipe is used.

(e) The deflection of joints shall not exceed that recommended by the pipe manufacturer.

1.2.11 Sewer Under Structures. - No main sewer shall be located beneath a structure except as approved in writing by the District

1.2.12 Structural Integrity. - Provisions shall be made in all cases to preserve the structural integrity of the pipes, conduits, or structures affected.

1.2.13 Depth of Sewer. - Permission from the District must be obtained if the following minimum depths may not be met. In general, the load on the pipe must be considered and adequate precautions taken to protect it either by means of encasement, supports, or added strength.

Minimum cover of pipe for various locations:

In public streets in pavement: 5 feet (service to properties permitting)
In public street parkways: 5 feet where possible
Lateral sewer (at curb or edge of pavement): 4 feet

In recorded easements, not subject to vehicular traffic...3 feet

Stream crossing: Standard drawings: No. E-13.

1.2.14 Sewer laterals. - A sewer lateral serving a single Family dwelling or equivalent shall be at least four inches in diameter, if the length of the lateral is one hundred feet or longer, a minimum of six inch diameter will be required. Sewer laterals shall conform to Section 3.15 of the Technical Specifications and Standard Drawings: E-9 Thu. E- 13 and Section 3.15 of the Technical Specifications. Sewer laterals in waterways, easements, and deep cuts should have the house service brought to a minimum depth of five (5) feet.

1.2.15 Special Sewer Design Conditions. _ When it is necessary to construct sewers and appurtenances in areas where a potential erosion hazard exists, individual design considerations shall be given to provide additional protection to the sewer facilities to prevent their damage. Special design considerations can be applicable to stream and canyon crossings, parallel construction to stream beds, construction on steep slopes requiring special anchorage, and shallow sewer construction in roadways. Concrete encasements, cutoff walls (Standard Drawing No. E-20), special backfill materials (soil cement), and special erosion - control facilities may be required.

1.2.16 Clearance From Other Utilities. - Special care shall be exercised in locating sewer lines near other utilities, especially water lines. Sewer lines shall, wherever possible, be located three (3) feet below water lines and where parallel installations occur, a ten (10) foot horizontal separation shall be maintained. Separations and special construction shall conform to Standard Drawing No. E-1.

1.2.17 Use of Asbestos- Cement Sewer Pipes. Due to the carcinogenic properties of asbestos fibers. Asbestos Cement pipe shall not be used in sanitary sewer systems.

1.3 OVERSIZING REQUIRED BY DISTRICT.

The District may find that the capacity of certain new sewers and pump stations within an area under development should be increased to accommodate existing or future additional development. In such a case, the quantity of additional flow shall be determined by the District's Engineer. The flow resulting from the addition of the developer's and the District Engineer's "Computer peak flow" shall be used as the basis of design. The District shall pay for any resulting increase in size or depth according to Section 1.9.07 of the District's Ordinance.

1.4 MANHOLES AND CLEANOUTS.

1.4.0 Manhole Location and Spacing. - Manholes shall be located at all junctions, all changes in direction (except curved sewers), and all changes in pipe size. Where the distance between manholes required for the foregoing reasons exceeds three hundred (300) feet. Good judgment should be used in placing intermediate man hole at points of probable sewer intersections, at beginning or end of curves, or lacking other reasons, at approximately equal intervals. In general, the space between Manholes is a maximum of three hundred (300) feet... In areas where slopes equal or exceed twenty five percent (25%) manhole spacing shall not exceed one hundred (100) feet. Good judgment should be used in the location of manholes along water courses. Manholes should not be placed directly in the water courses. Manholes can be either coated concrete or polymer based structures and shall conform to Standard Drawing No. E-2 thru E-6.

1.4.02 Shallow Manholes. - Manholes three (3) feet or less in depth above the shelf shall be of special design.

1.4.03 Cleanouts. - Dead-end sewers not over one hundred and seventy-five (175) feet in length shall terminate in standard manholes or cleanouts. Cleanouts shall be brought to ground surface in a long radius or two (2) forty-five degree (45) angles with a full sewer diameter opening. Cast iron frame and cover shall be provided. Dead ends over one hundred and seventy-five (175) feet shall terminate in standard manholes unless future extension of said dead end will include a manhole within three hundred and fifty (350) feet, in which case a temporary cleanout is permitted. Cleanouts shall conform to Standard Drawing No. E-14 and E-15 and Section 4.0 of the
Technical Specifications.

1.4.03.1 Abandoning Existing Sewer Stub– Existing sewer stubs to be abandoned shall be approved by District Engineer.

1.4.03.2 Grease Interceptor- A Grease interceptor shall be required for any business having the potential of producing grease. Size of the interceptor will be approved by the District Engineer.

1.4.03.3 Oil/Sand Interceptor- An oil/sand interceptor shall be installed for any business having the potential of producing oil and sand waste. Size of interceptor shall be approved by the District Engineer.

1.4.04 **Drop Manholes.** - Whenever possible, sewers shall be brought into manholes without a drop. Where the invert of an incoming sewer is above the top of an outlet sewer, a drop manhole will be required and shall conform to Standard Drawing No. E-4 and Section 4.0 of the Technical Specifications.

1.4.05 **Manhole Trap**. - A special type manhole trap may be required to provide a means to prevent debris from clogging the sewer. The manhole trap shall conform to Section 4.0 of the Technical Specifications.

1.4.06 **Frame and Covers.** - All manholes and cleanouts, except the manhole trap in 1.4.05, shall have cast iron frames and covers. All frame and covers shall be provided with stainless steel fasteners recessed into the cover for locking the cover in place. The tap shall be drilled through the frame for easy cleaning. In no case shall the diameter of a manhole be less than twenty four (24) inches, inside diameter.

1.5 SEWAGE LIFT STATIONS.

1.5.01 **General.** - Sewage lift stations shall only be utilized where it is impossible to provide gravity flow to interceptor sewers, or other portions of the collection system. The use of sewage lift stations to provide service to ten (10) or fewer lots or parcels of land will not be permitted. The use of underground, factory built units is desired; below ground use of reinforced concrete construction is discouraged; and masonry block structures are not permitted. Sewage lift stations shall be located in areas accessible to both men and equipment and upon land to which legal access is provided and for which a permanent easement or title is recorded. Where structures above ground are required, the structure shall be compatible with the surroundings, an alternate flow path shall be provided for wet well maintenance.

1.5.02 **Capacity.** - Capacity of the pumps shall be sufficient to handle ultimate peak flows from the tributary area with the largest pump out of service. If areas outside the proposed development may best be sewered to a sewage lift station, the District reserves the right to order oversizing of such facilities and provide reimbursement to the developer for the cost increment of the additional construction. The wet well storage shall be sized to be compatible with pump capacity and to eliminate frequent pump cycling.

1.5.03 **Standby Power.** - A standby generator shall be provided where, in the opinion of the District, potential hazard to the health and safety of the people in the immediate area, due to overflow, is imminent or the normal energy source is subject to outages. Capacity of the generator shall be sufficient to handle peak flows.

1.5.04 **Pumps and Motors.** - At least two (2) pumps or sewage ejectors shall be provided at each lift station. Pump or discharge shall be no less than four (4) inches in diameter; the pump shall be so placed that under normal operating conditions it will operate under a positive head at the suction inlet. The speed of pumps and motors shall be no greater than seventeen hundred and sixty (1,760) rpm, and the pump shaft shall not be supported by the motor shaft.

A separate sump pump shall be provided in the lift station structure to remove leakage or drainage, with the discharge into the wet well above the high water level.

The sewage ejector station shall have two (2) sewage pots, two (2) receiver type compressors and one (1) air storage tank.

1.5.05 **Structure.** - The wet well or manhole shall be completely separated from the main sewage lift station structure. The sewage lift station structure shall be designed by qualified engineers. Provisions within this structure shall be made to facilitate removing of pumps, motors and other equipment. Suitable stairways or ladders shall be provided for convenient access and all requirements of the State Division of Industrial Safety shall be complied with in the manufacturing of the unit, provisions for access, and for the protection of persons and property from mechanical or electrical equipment.

1.5.06 **Electrical Equipment.**

(a) All electrical starters, switches, lights, motors, fixtures, controllers and instruments shall be enclosed and constructed in accordance with the National Board of Fire Underwriter's Specifications to meet the hazardous conditions anticipated. The Health and Safety Code of the State of California shall also be met.

(b) All starters shall be of the magnetic type and shall be provided with hand, off or, automatic (HOA) selector switches.

(c) The motor starters shall be operated automatically from a wet well liquid level control. Controls of the sonic level type are required.

(d) Standby equipment shall be started automatically upon power failure.

1.5.07 Miscellaneous Requirements.

(a) Adequate ventilation shall be provided for all pump stations. Where the pump pit is below the ground surface, mechanical ventilation is required to effectively ventilate the dry well and also the wet well if screens or mechanical equipment requiring maintenance or inspection are located in the wet well. The ventilation equipment should have a minimum capacity of six (6) turnovers per hour under continuous operation. With intermittent operation, a two (2) minute turnover should be provided. Equipment shall start automatically with door opening.

(b) Gate valves shall be placed on suction and discharge lines of each pump. A lever and weight operated swing check valve shall be placed on each discharge line between the gate valve and the pump.

(c) An air compressor, to inject air into the force main, may be required by the District, depending upon an analysis of possible sulfide conditions.

(d) Steel fabricated, factory units shall be provided with some means of cathodic protection.

(e) A high water alarm circuit shall be provided to permit transmission of high water level indication over leased telephone lines. The circuits shall be complete to and including terminal point for leased lines at station. A local alarm light and or horn may be required by the District.

(f) An electric dehumidifier shall be provided, which is to operate on a refrigeration cycle and is automatically controlled by and adjustable humidistat, and has a thermostatically controlled heater to complement the dehumidifier.

1.6 PLAN PREPARATION.

Plans prepared for additions to the District's sewerage system and submitted to the District for approval shall be in substantial form and contain the information as herein set forth.

1.6.01 - Drawings shall be ink on mylar, sheet size shall be 36-inch by 24-inch with standard District title block. FINAL drawings shall be placed in AutoCAD electronic format, copied and given to the District for archiving.

1.6.02 - The General Notes shall appear once on the first plan and profile sheet. All required certifications and approvals also appear on the first sheet.

1.6.03 - Each sheet shall have a title block in the lower right hand corner.

1.6.04 - Each sheet shall have a "North" arrow, where applicable.

1.6.05 - A key map having a scale of 1 inch = 500 feet or larger shall be shown on the first sheet of each set of drawings. Said key map shall show all sewers, their sizes, manholes and appurtenances in their scaled relation to one another. All roads shall be shown.

1.6.06 - Plan and profile sheets shall have a scale of 1 inch = 40 feet horizontal and 1 inch = 4 feet vertical. Or 1 inch = 50 feet horizontal and 1 inch = 5 feet vertical. Double plan and profile sheets may be used.

1.6 07 - At least one (1) bench mark shall be shown and/or described on each sheet.

1.6.08 - The profile shall show the size of pipe; the type of pipe; the pipe strength; manhole center location by station; invert; elevation of sewer pipe at manhole center; the existing ground elevation and proposed finished ground elevation; the grade of pipes in percent; the depth, size, nature and location of all other utilities which cross over or under the sewer; location and nature of special construction such as the encasement of bored casings; and any other information pertinent and necessary to the proper construction and recordation of the sewers.

1.6.09 - The plans shall show the tract and lot numbers of all property adjacent to the sewer to be constructed.

1.6.10 - The plans shall show all right of way lines, the distance form the centerline of all roads, rights of way and easements to the center of the sewer.

1.6.11 - The plans shall show exact location of proposed house connections.

1.6.12 - The plans shall show exact location of all structures within twenty (20) feet of the sewer centerline and shall show all water wells within fifty (50) feet of the sewer centerline.

1.7 TECHNICAL SPECIFICATIONS.

The District's Technical Specifications shall be utilized in the design of sewer facilities. Technical Specifications are in Division "D" of the District's adopted policies.

1.8 STANDARD DRAWINGS.

The District's Standard Drawings shall be utilized in the design of sewer facilities. Standard Drawings are shown in Division "E" of the District's adopted policies.

APPENDIX C

2022 California Plumbing Code Appendix H

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APPENDIX H

PRIVATE SEWAGE DISPOSAL SYSTEMS

The provisions contained in this appendix are not mandatory unless specifically adopted by a state agency, or referenced in the adopting ordinance.

H 101.0 General.

H 101.1 Applicability. This appendix provides general guidelines for the materials, design, and installation of private sewage disposal systems.

H 101.2 General Requirements. Where permitted by Section 713.0, the building sewer shall be permitted to be connected to a private sewage disposal system in accordance with the provisions of this appendix. The type of system shall be determined on the basis of location, soil porosity, and groundwater level, and shall be designed to receive all sewage from the property. The system, except as otherwise approved, shall consist of a septic tank with effluent discharging into a subsurface disposal field, into one or more seepage pits, or into a combination of subsurface disposal field and seepage pits. The Authority Having Jurisdiction shall be permitted to grant exceptions to the provisions of this appendix for permitted structures that have been destroyed due to fire or natural disaster, and that cannot be reconstructed in compliance with these provisions provided that such exceptions are the minimum necessary.

H 101.3 Quantity and Quality. Where the quantity or quality of the sewage is such that the above system cannot be expected to function satisfactorily for commercial, agricultural, and industrial plumbing systems; for installations where appreciable amounts of industrial or indigestible wastes are produced; for occupancies producing abnormal quantities of sewage or liquid waste; or where grease interceptors are required by other parts of this code, the method of sewage treatment and disposal shall be first approved by the Authority Having Jurisdiction. Special sewage disposal systems for minor, limited, or temporary uses shall be first approved by the Authority Having Jurisdiction.

H 101.4 Septic Tank and Disposal Field Systems. Disposal systems shall be designed to utilize the most porous or absorptive portions of the soil formation. Where the groundwater level extends to within 12 feet (3658 mm) or less of the ground surface or where the upper soil is porous, and the underlying stratum is rock or impervious soil, a septic tank and disposal field system shall be installed.

H 101.5 Flood Hazard Areas. Disposal systems shall be located outside of flood hazard areas.

Exception: Where suitable sites outside of flood hazard areas are not available, disposal systems shall be permitted to be located in flood hazard areas on sites where the effects of inundation under conditions of the design flood are minimized.

H 101.6 Design. Private sewage disposal systems shall be so designed that additional seepage pits or subsurface drain fields, equivalent to not less than 100 percent of the required original system, shall be permitted to be installed where the original system cannot absorb all the sewage. No division of the lot or erection of structures on the lot shall be made where such division or structure impairs the usefulness of the 100 percent expansion area.

H 101.7 Capacity. No property shall be improved more than its capacity to absorb sewage effluent properly by the means provided in this code.

Exception: The Authority Having Jurisdiction shall be permitted to, at its discretion, approve an alternate system.

H 101.8 Location. No private sewage disposal system, or part thereof, shall be located in any lot other than the lot that is the site of the building or structure served by such private sewage disposal system, nor shall any private sewage disposal system or part thereof be located at any point having less than the minimum distances indicated in Table H 101.8.

Nothing contained in this code shall be construed to prohibit the use of all or part of an abutting lot to provide additional space for a private sewage disposal system or part thereof where proper cause, transfer of ownership, or change of boundary not in violation of other requirements has been first established to the satisfaction of the Authority Having Jurisdiction. The instrument recording such action shall constitute an agreement with the Authority Having Jurisdiction, which shall clearly state and show that the areas so joined or used shall be maintained as a unit during the time they are so used. Such agreement shall be recorded in the office of the County Recorder as part of the conditions of ownership of said properties and shall be binding on heirs, successors, and assigns to such properties. A copy of the instrument recording such proceedings shall be filed with the Authority Having Jurisdiction.

H 101.9 Building Permit. Where there is insufficient lot area or improper soil conditions for sewage disposal for the building or land use proposed, and the Authority Having Jurisdiction so finds, no building permit shall be issued, and no private sewage disposal shall be permitted. Where space or soil conditions are critical, no building permit shall be issued until engineering data, and test reports satisfactory to the Authority Having Jurisdiction have been submitted and approved.

H 101.10 Additional Requirements. Nothing contained in this appendix shall be construed to prevent the Authority Having Jurisdiction from requiring compliance with additional requirements than those contained herein, where such additional requirements are essential to maintaining a safe and sanitary condition.

H 101.11 Alternate Systems. Alternate systems shall be permitted to be used by special permission of the Authority Having Jurisdiction after being satisfied with their adequacy. This authorization is based on extensive field and test data from conditions similar to those at the proposed site or requires such additional data as necessary to assure that the alternate system will produce continuous and long-range results at the proposed site, not less than equivalent to systems which are specifically authorized.

Where demonstration systems are to be considered for installation, conditions for installation, maintenance, and monitoring at each such site shall first be established by the Authority Having Jurisdiction.

Approved aerobic systems shall be permitted to be substituted for conventional septic tanks provided the Authority Having Jurisdiction is satisfied that such systems will produce results not less than equivalent to septic tanks, whether their aeration systems are operating or not.

TABLE H 101.8
LOCATION OF SEWAGE DISPOSAL SYSTEM

MINIMUM HORIZONTAL DISTANCE	BUILDING SEWER	SEPTIC TANK	DISPOSAL FIELD	SEEPAGE PIT OR CESSPOOL
Building or structures[1]	2 feet	5 feet	8 feet	8 feet
Property line adjoining private property	Clear[2]	5 feet	5 feet	8 feet
Water supply wells	50 feet[3]	50 feet	100 feet	150 feet
Streams and other bodies of water	50 feet	50 feet	100 feet[7]	150 feet[7]
Trees	–	10 feet	–	10 feet
Seepage pits or cesspools[8]	–	5 feet	5 feet	12 feet
Disposal field[8]	–	5 feet	4 feet[4]	5 feet
On-site domestic water service line	1 foot[5]	5 feet	5 feet	5 feet
Distribution box	–	–	5 feet	5 feet
Pressure public water main	10 feet[6]	10 feet	10 feet	10 feet

For SI units: 1 foot = 304.8 mm

Notes:

1. Including porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.
2. See Section 312.3.
3. Drainage piping shall clear domestic water supply wells by not less than 50 feet (15 240 mm). This distance shall be permitted to be reduced to not less than 25 feet (7620 mm) where the drainage piping is constructed of materials approved for use within a building.
4. Plus 2 feet (610 mm) for each additional 1 foot (305 mm) of depth more than 1 foot (305 mm) below the bottom of the drain line. (See Section H 601.0)
5. See Section 720.0.
6. For parallel construction – For crossings, approval by the Health Department shall be required.
7. These minimum clear horizontal distances shall also apply to disposal fields, seepage pits, and the mean high-tide line.
8. Where disposal fields, seepage pits, or both are installed in sloping ground, the minimum horizontal distance between any part of the leaching system and ground surface shall be 15 feet (4572 mm).

H 201.0 Capacity of Septic Tanks.

H 201.1 General. The liquid capacity of septic tanks shall comply with Table H 201.1(1) and Table H 201.1(4) as determined by the number of bedrooms or apartment units in dwelling occupancies and the estimated waste/sewage design flow rate or the number of plumbing fixture units as determined from Table 702.1 of this code, whichever is greater in other building occupancies. The capacity of any one septic tank and its drainage system shall be limited to the soil structure classification in Table H 201.1(2), and as specified in Table H 201.1(3).

TABLE H 201.1(1)
CAPACITY OF SEPTIC TANKS[1, 2, 3, 4]

SINGLE-FAMILY DWELLINGS - NUMBER OF BEDROOMS	MULTIPLE DWELLING UNITS OR APARTMENTS - ONE BEDROOM EACH	OTHER USES: MAXIMUM FIXTURE UNITS SERVED PER TABLE 702.1	MINIMUM SEPTIC TANK CAPACITY (gallons)
1 or 2	–	15	750
3	–	20	1000
4	2 units	25	1200
5 or 6	3	33	1500
–	4	45	2000
–	5	55	2250
–	6	60	2500
–	7	70	2750
–	8	80	3000
–	9	90	3250
–	10	100	3500

For SI units: 1 gallon = 3.785 L

Notes:

1. Extra bedroom, 150 gallons (568 L) each.
2. Extra dwelling units over 10: 250 gallons (946 L) each.
3. Extra fixture units over 100: 25 gallons (94.6 L) per fixture unit.
4. Septic tank sizes in this table include sludge storage capacity and the connection of domestic food waste disposers without further volume increase.

TABLE H 201.1(2)
DESIGN CRITERIA OF FIVE TYPICAL SOILS

TYPE OF SOIL	REQUIRED SQUARE FEET OF LEACHING AREA PER 100 GALLONS	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FEET OF LEACHING AREA FOR A 24 HOUR PERIOD
Coarse sand or gravel	20	5.0
Fine sand	25	4.0
Sandy loam or sandy clay	40	2.5
Clay with considerable sand or gravel	90	1.1
Clay with small amount of sand or gravel	120	0.8

For SI units: 1 square foot = 0.0929 m^2, 1 gallon = 3.785 L, 1 gallon per square foot = 40.7 L/m^2

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TABLE H 201.1(3)
LEACHING AREA SIZE BASED ON SEPTIC TANK CAPACITY

REQUIRED SQUARE FEET OF LEACHING AREA PER 100 GALLONS SEPTIC TANK CAPACITY (square feet per 100 gallons)	MAXIMUM SEPTIC TANK SIZE ALLOWABLE (gallons)
20–25	7500
40	5000
90	3500
120	3000

For SI units: 1 square foot per 100 gallons = 0.000245 m²/L, 1 gallon = 3.785 L

TABLE H 201.1(4)
ESTIMATED WASTE/SEWAGE FLOW RATES[1, 2, 3]

TYPE OF OCCUPANCY	GALLONS PER DAY
Airports (per employee)	15
Airports (per passenger)	5
Auto washers – check with equipment manufacturer	–
Bowling alleys – with snack bar only (per lane)	75
Campground – with central comfort station (per person)	35
Campground – with flush toilets - no showers (per person)	25
Camps (day) – no meals served (per person)	15
Camps (summer and seasonal camps) – (per person)	50
Churches – sanctuary (per seat)	5
Churches – with kitchen waste (per seat)	7
Dance halls – (per person)	5
Factories – no showers (per employee)	25
Factories – with showers (per employee)	35
Factories – with cafeteria (per employee)	5
Hospitals – (per bed)	250
Hospitals – kitchen waste only (per bed)	25
Hospitals – laundry waste only (per bed)	40
Hotels – no kitchen waste (per bed)	60
Institutions – resident (per person)	75
Nursing home – (per person)	125
Rest home – (per person)	125
Laundries – self-service with minimum 10 hours per day (per wash cycle)	50
Laundries – commercial check with manufacturer's specification	–
Motel (per bed space)	50
Motel – with kitchen (per bed space)	60
Offices – (per employee)	20
Parks – mobile homes (per space)	250
Parks (picnic) – with toilets only (per parking space)	20
Parks (recreational vehicles) – without water hook-up (per space)	75
Parks (recreational vehicles) – with water and sewer hook-up (per space)	100
Restaurants – cafeteria (per employee)	20
Restaurants – with toilet waste (per customer)	7
Restaurants – with kitchen waste (per meal)	6
Restaurants – with kitchen waste disposable service (per meal)	2
Restaurants – with garbage disposal (per meal)	1
Restaurants – with cocktail lounge (per customer)	2
Schools staff and office (per person)	20
Schools – elementary (per student)	15
Schools – intermediate and high (per student)	20
Schools – with gym and showers (per student)	5

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TABLE H 201.1(4) (continued)
ESTIMATED WASTE/SEWAGE FLOW RATES[1, 2, 3]

TYPE OF OCCUPANCY	GALLONS PER DAY
Schools – with cafeteria (per student)	3
Schools (boarding) – total waste (per person)	100
Service station – with toilets for 1st bay	1000
Service station – with toilets for each additional bay	500
Stores – (per employee)	20
Stores – with public restrooms (per 10 square feet of floor space)	1
Swimming pools – public (per person)	10
Theaters – auditoriums (per seat)	5
Theaters – with drive-in (per space)	10

For SI units: 1 square foot = 0.0929 m², 1 gallon per day = 3.785 L/day

Notes:

1 Sewage disposal systems sized using the estimated waste/sewage flow rates shall be calculated as follows:
- (a) Waste/sewage flow, up to 1500 gallons per day (5678 L/day)
  Flow x 1.5 = septic tank size
- (b) Waste/sewage flow, over 1500 gallons per day (5678 L/day)
  Flow x 0.75 + 1125 = septic tank size
- (c) Secondary system shall be sized for total flow per 24 hours.

2 See Section H 201.1.

3 Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations. The designer should evaluate each situation and, where figures in this table need modification; they should be made with the concurrence of the Authority Having Jurisdiction.

H 301.0 Area of Disposal Fields and Seepage Pits.

H 301.1 General. The minimum effective absorption area in disposal fields in square feet (m^2), and in seepage pits in square feet (m^2) of sidewall, shall be predicated on the required septic tank capacity of gallons (liters), estimated waste/sewage flow rate, or whichever is greater, and shall be in accordance with Table H 201.1(2) as determined by the type of soil found in the excavation, and shall be as follows:

(1) Where disposal fields are installed, not less than 150 square feet (13.9 m^2) of trench bottom shall be provided for each system exclusive of any hard pan, rock, clay, or other impervious formations. Sidewall area more than the required 12 inches (305 mm) and not exceeding 36 inches (914 mm) below the leach line shall be permitted to be added to the trench bottom area where computing absorption areas.

(2) Where leaching beds are permitted instead of trenches, the area of each such bed shall be not less than 50 percent greater than the tabular requirements for trenches. Perimeter sidewall area more than the required 12 inches (305 mm) and not exceeding 36 inches (914 mm) below the leach line shall be permitted to be added to the trench bottom area where computing absorption areas.

(3) No excavation for a leach line or leach bed shall be located within 5 feet (1524 mm) of the water table nor to a depth where sewage is capable of contaminating the underground water stratum that is usable for domestic purposes.

Exception: In areas where the records or data indicate that the groundwaters are grossly degraded, the 5 foot (1524 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction. The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

(4) The minimum effective absorption area in any seepage pit shall be calculated as the excavated sidewall area below the inlet exclusive of any hardpan, rock, clay, or other impervious formations. The minimum required area of porous formation shall be provided in one or more seepage pits. No excavation shall extend within 10 feet (3048 mm) of the water table nor to a depth where sewage is capable of contaminating underground water stratum that is usable for domestic purposes.

Exception: In areas where the records or data indicate that the groundwaters are grossly degraded, the 10 foot (3048 mm) separation requirement shall be permitted to be reduced by the Authority Having Jurisdiction.

The applicant shall supply evidence of groundwater depth to the satisfaction of the Authority Having Jurisdiction.

(5) Leaching chambers that comply with IAPMO PS 63 and bundled expanded polystyrene synthetic aggregate units that comply with IAPMO IGC 276 shall be sized using the required area calculated using Table H 201.1(2) with a 0.70 multiplier.

H 401.0 Percolation Test.

H 401.1 Pit Sizes. Where practicable, disposal field and seepage pit sizes shall be computed from Table H 201.1(2). Seepage pit sizes shall be computed by percolation tests unless use of Table H 201.1(2) is approved by the Authority Having Jurisdiction.

H 401.2 Absorption Qualities. The absorption qualities of seepage pits and questionable soils other than those listed in Table H 201.1(2), the proposed site, shall be subjected to percolation tests acceptable to the Authority Having Jurisdiction.

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H 401.3 Absorption Rates. Where a percolation test is required, no private disposal system shall be permitted to serve a building where that test shows the absorption capacity of the soil is less than 0.83 gallons per square foot (gal/ft^2) (33.8 L/m^2) or more than 5.12 gal/ft^2 (208.6 L/m^2) of leaching area per 24 hours. Where the percolation test shows an absorption rate greater than 5.12 gal/ft^2 (208.6 L/m^2) per 24 hours, a private disposal system shall be permitted where the site does not overlie groundwaters protected for drinking water supplies, a minimum thickness of 2 feet (610 mm) of the native soil below the entire proposed system is replaced by loamy sand, and the system design is based on percolation tests made in the loamy sand.

H 501.0 Septic Tank Construction.

H 501.1 Plans. Plans for septic tanks shall be submitted to the Authority Having Jurisdiction for approval. Such plans shall show dimensions, reinforcing, structural calculations, and such other pertinent data as required.

H 501.2 Design. Septic tank design shall be such as to produce a clarified effluent consistent with accepted standards and shall provide adequate space for sludge and scum accumulations.

H 501.3 Construction. Septic tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

H 501.4 Compartments. Septic tanks shall have not less than two compartments unless otherwise approved by the Authority Having Jurisdiction. The inlet compartment of any septic tank shall be not less than two-thirds of the total capacity of the tank, nor less than 500 gallons (1892 L) liquid capacity, and shall be not less than 3 feet (914 mm) in width and 5 feet (1524 mm) in length. Liquid depth shall be not less than 2½ feet (762 mm) nor more than 6 feet (1829 mm). The secondary compartment of a septic tank shall have a capacity of not less than 250 gallons (946 L) and a capacity not exceeding one-third of the total capacity of such tank. In septic tanks having a 1500 gallon (5678 L) capacity, the secondary compartment shall be not less than 5 feet (1524 mm) in length.

H 501.5 Access. Access to each septic tank shall be provided by not less than two manholes 20 inches (508 mm) in minimum dimension or by an equivalent removable cover slab. One access manhole shall be located over the inlet, and one access manhole shall be located over the outlet. Where a first compartment exceeds 12 feet (3658 mm) in length, an additional manhole shall be provided over the baffle wall.

H 501.6 Pipe Opening Sizes. The inlet and outlet pipe openings shall not be larger in size than the connecting sewer pipe. The vertical leg of round inlet and outlet fittings shall not be less in size than the connecting sewer pipe nor less than 4 inches (100 mm) in diameter. A baffle-type fitting shall have the equivalent cross-sectional area of the connecting sewer pipe and not less than a 4 inch (102 mm) horizontal dimension where measured at the inlet and outlet pipe inverts.

H 501.7 Pipe Extension. The inlet and outlet pipe or baffle shall extend 4 inches (102 mm) above and not less than 12 inches (305 mm) below the water surface. The invert of the inlet pipe shall be at a level not less than 2 inches (51 mm) above the invert of the outlet pipe.

H 501.8 Free Vent Area. Inlet and outlet pipe fittings or baffles and compartment partitions shall have a free vent area equal to the required cross-sectional area of the house sewer or private sewer discharging therein to provide free ventilation above the water surface from the disposal field or seepage pit through the septic tank, house sewer, and stack to the outer air.

H 501.9 Sidewalls. The sidewalls shall extend not less than 9 inches (229 mm) above the liquid depth. The cover of the septic tank shall be not less than 2 inches (51 mm) above the back vent openings.

H 501.10 Partitions and Baffles. Partitions or baffles between compartments shall be of solid, durable material and shall extend not less than 4 inches (102 mm) above the liquid level. The transfer port between compartments shall be a minimum size equivalent to the tank inlet, but in no case less than 4 inches (102 mm) in size, shall be installed in the inlet compartment side of the baffle so that the entry into the port is placed 65 percent to 75 percent in the depth of the liquid. Wooden baffles are prohibited.

H 501.11 Structural Design. The structural design of septic tanks shall comply with the following requirements:

(1) Each such tank shall be structurally designed to withstand all anticipated earth or other loads. Septic tank covers shall be capable of supporting an earth load of not less than 500 pounds per square foot (lb/ft^2) (2441 kg/m^2) where the maximum coverage does not exceed 3 feet (914 mm).

(2) In flood hazard areas, tanks shall be anchored to counter buoyant forces during conditions of the design flood. The vent termination and service manhole of the tank shall be not less than 2 feet (610 mm) above the design flood elevation or fitted with covers designed to prevent the inflow of floodwater or the outflow of the contents of the tanks during conditions of the design flood.

H 501.12 Manholes. Septic tanks installed under concrete or blacktop paving shall have the required manholes accessible by extending the manhole openings to grade in a manner acceptable to the Authority Having Jurisdiction.

H 501.13 Materials. The materials used for constructing a septic tank shall be in accordance with the following:

(1) Materials used in constructing a concrete septic tank shall be in accordance with applicable standards in Chapter 17.

(2) The minimum wall thickness of a steel septic tank shall be number 12 U.S. gauge (0.109 of an inch) (2.77 mm), and each such tank shall be protected from corrosion both externally and internally by an approved bituminous coating or by other acceptable means.

(3) Septic tanks constructed of alternate materials shall be permitted to be approved by the Authority Having Jurisdiction where in accordance with approved applicable standards. Wooden septic tanks shall be prohibited.

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APPENDIX H

H 501.14 Prefabricated Septic Tanks. Prefabricated septic tanks shall comply with the following requirements:

(1) Manufactured or prefabricated septic tanks shall comply with approved applicable standards and be approved by the Authority Having Jurisdiction. Prefabricated bituminous coated septic tanks shall comply with UL 70.

(2) Independent laboratory tests and engineering calculations certifying the tank capacity and structural stability shall be provided as required by the Authority Having Jurisdiction.

H 601.0 Disposal Fields.

H 601.1 Distribution Lines. Distribution lines shall be constructed of clay tile laid with open joints, perforated clay pipe, perforated bituminous fiber pipe, perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that approved openings are available for distribution of the effluent into the trench area.

H 601.2 Filter Material. Before placing filter material or drain lines in a prepared excavation, smeared or compacted surfaces shall be removed from trenches by raking to a depth of 1 inch (25.4 mm) and the loose material removed. Clean stone, gravel, slag, or similar filter material acceptable to the Authority Having Jurisdiction, varying in size from ¾ of an inch to 2½ inches (19.1 mm to 64 mm), shall be placed in the trench to the depth and grade required by this section. Drain pipe shall be placed on filter material in an approved manner. The drain lines shall then be covered with filter material to the minimum depth required by this section, and this material covered with untreated building paper, straw, or similar porous material to prevent the closure of voids with earth backfill. No earth backfill shall be placed over the filter material cover until after inspection and acceptance.

Exception: Listed or approved plastic leaching chambers and bundled expanded polystyrene synthetic aggregate units shall be permitted to be used in lieu of pipe and filter material. Chamber and bundled expanded polystyrene synthetic aggregate unit installations shall follow the rules for disposal fields, where applicable, and shall be in accordance with the manufacturer's instructions.

H 601.3 Grade Board. A grade board staked in the trench to the depth of filter material shall be utilized where the distribution line is constructed with drain tile or a flexible pipe material that will not maintain alignment without continuous support.

H 601.4 Seepage Pits. Where seepage pits are used in combination with disposal fields, the filter material in the trenches shall terminate not less than 5 feet (1524 mm) from the pit excavation, and the line extending from such points to the seepage pit shall be approved pipe with watertight joints.

H 601.5 Distribution Boxes. Where two or more drain lines are installed, an approved distribution box of sufficient size to receive lateral lines shall be installed at the head of each disposal field. The invert of outlets shall be level, and the invert of the inlet shall be not less than 1 inch (25.4 mm) above the outlets. Distribution boxes shall be designed to ensure equal flow and shall be installed on a level concrete slab in natural or compacted soil.

H 601.6 Laterals. Laterals from a distribution box to the disposal field shall be approved pipe with watertight joints. Multiple disposal field laterals, where practicable, shall be of uniform length.

H 601.7 Connections. Connections between a septic tank and a distribution box shall be laid with approved pipe with watertight joints on natural ground or compacted fill.

H 601.8 Dosing Tanks. Where the quantity of sewage exceeds the amount that is permitted to be disposed of in 500 lineal feet (152.4 m) of leach line, a dosing tank shall be used. Dosing tanks shall be equipped with an automatic siphon or pump that discharges the tank once every 3 or 4 hours. The tank shall have a capacity equal to 60 to 75 percent of the interior capacity of the pipe to be dosed at one time. Where the total length of pipe exceeds 1000 lineal feet (305 m), the dosing tank shall be provided with two siphons or pumps dosing alternately and each serving one-half of the leach field.

H 601.9 Construction. Disposal fields shall be constructed in accordance with Table H 601.9.

Minimum spacing between trenches or leaching beds shall be not less than 4 feet (1219 mm) plus 2 feet (610 mm) for each additional foot (305 mm) of depth more than 1 foot (305 mm) below the bottom of the drain line. Distribution drain lines in leaching beds shall be not more than 6 feet (1829 mm) apart on centers, and no part of the perimeter of the leaching bed shall exceed 3 feet (914 mm) from a distribution drain line. Disposal fields, trenches, and leaching beds shall not be paved over or covered by concrete or a material that is capable of reducing or inhibiting a possible evaporation of sewer effluent.

H 601.10 Joints. Where necessary on sloping ground to prevent excessive line slope, leach lines or leach beds shall be stepped. The lines between each horizontal section shall be made with watertight joints and shall be designed, so each horizontal leaching trench or bed shall be utilized to the maximum capacity before the effluent shall pass to the next lower leach line or bed. The lines between each horizontal leaching section shall be made with approved watertight joints and installed on the natural or unfilled ground.

TABLE H 601.9
GENERAL DISPOSAL FIELD REQUIREMENTS

ELEMENT	MINIMUM	MAXIMUM
Number of drain lines per field	1	-
Length of each line	-	100 feet
Bottom width of trench	18 inches	36 inches
Spacing of lines, center-to-center	6 feet	-
Depth of earth cover of lines (preferred 18 inches)	12 inches	-
Grade of lines	level	3 inches per 100 feet
Filter material under drain lines	12 inches	-
Filter material over drain lines	2 inches	-

For SI units: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 83.3 mm/m

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H 701.0 Seepage Pits.

H 701.1 Capacity. The capacity of seepage pits shall be based on the quantity of liquid waste discharging thereinto and on the character and porosity of the surrounding soil, and shall be in accordance with Section H 301.0 of this appendix.

H 701.2 Multiple Installations. Multiple seepage pit installations shall be served through an approved distribution box or be connected in series using a watertight connection laid on undistributed or compacted soil. The outlet from the pit shall have an approved vented leg fitting extending not less than 12 inches (305 mm) below the inlet fitting.

H 701.3 Construction. A seepage pit shall be circular in shape and shall have an excavated diameter of not less than 4 feet (1219 mm). Each such pit shall be lined with approved-type whole new hard-burned clay brick, concrete brick, concrete circular-type cesspool blocks, or other approved materials. Approval shall be obtained before construction for any pit having an excavated diameter greater than 6 feet (1829 mm).

H 701.4 Lining. The lining in a seepage pit shall be laid on a firm foundation. Lining materials shall be placed tight together and laid with joints staggered. Except in the case of approved-type precast concrete circular sections, no brick or block shall be greater in height than its width and shall be laid flat to form not less than a 4 inch (102 mm) wall. Brick or block greater than 12 inches (305 mm) in length shall have chamfered matching ends and be scored to provide for seepage. Excavation voids behind the brick, block, or concrete liner shall have not less than 6 inches (152 mm) of clean ¾ of an inch (19.1 mm) gravel or rock.

H 701.5 Brick and Block. Brick or block used in seepage pit construction shall have a compressive strength of not less than 2500 pounds per square inch (lb/in^2) (1 757 674 kg/m^2).

H 701.6 Sidewall. A seepage pit shall have a minimum sidewall (not including the arch) of 10 feet (3048 mm) below the inlet.

H 701.7 Arch and Dome. The arch or dome of a seepage pit shall be permitted to be constructed in one of three ways:

(1) Approved-type hard-burned clay brick or solid concrete brick or block laid in cement mortar.

(2) Approved brick or block laid dry. In both of the above methods, an approved cement mortar covering of not less than 2 inches (51 mm) in thickness shall be applied, said covering to extend not less than 6 inches (152 mm) beyond the sidewalls of the pit.

(3) Approved-type one or two-piece reinforced concrete slabs of not less than 2500 lb/in^2 (1 757 674 kg/m^2) minimum compressive strength, not less than 5 inches (127 mm) thick, and designed to support an earth load of not less than 400 pounds per square foot (lb/ft^2) (1953 kg/m^2). Each such cover shall be provided with a 9 inch (229 mm) minimum inspection hole with plug or cover and shall be coated on the underside with an approved bituminous or other nonpermeable protective compound.

H 701.8 Location. The top of the arch or cover shall be not less than 18 inches (457 mm) but not exceed 4 feet (1219 mm) below the surface of the ground.

H 701.9 Inlet Fitting. An approved vented inlet fitting shall be provided in the seepage pit so arranged as to prevent the inflow from damaging the sidewall.

Exception: Where using a one- or two-piece concrete slab cover inlet, fitting shall be permitted to be a one-fourth bend fitting discharging through an opening in the top of the slab cover. On multiple seepage pit installations, the outlet fittings shall comply with Section H 701.2 of this appendix.

H 801.0 Cesspools.

H 801.1 Limitations. A cesspool shall be considered as a temporary expedient pending the construction of a public sewer; as an overflow facility where installed in conjunction with an existing cesspool; or as a means of sewage disposal for limited, minor, or temporary uses, where first approved by the Authority Having Jurisdiction.

H 801.2 Septic Tanks. Where it is established that a public sewer system will be available in less than 2 years, and soil and groundwater conditions are favorable to cesspool disposal, cesspools without septic tanks shall be permitted to be installed for single-family dwellings or for other limited uses where first approved by the Authority Having Jurisdiction.

H 801.3 Construction. Each cesspool, where permitted, shall be in accordance with the construction requirements set forth in Section H 701.0 of this appendix for seepage pits and shall have a sidewall (not including arch) of not less than 20 feet (6096 mm) below the inlet, provided, however, that where a strata of gravel or equally pervious material of 4 feet (1219 mm) in thickness is found, the depth of such sidewall shall not exceed 10 feet (3048 mm) below the inlet.

H 801.4 Existing Installations. Where overflow cesspools or seepage pits are added to existing installations, the effluent shall leave the existing pit through an approved vented leg extending not less than 12 inches (305 mm) downward into such existing pit and having its outlet flow line not less than 6 inches (152 mm) below the inlet. The pipe between pits shall be laid with approved watertight joints.

H 901.0 Commercial or Industrial Special Liquid-Waste Disposal.

H 901.1 Interceptor. Where liquid wastes contain excessive amounts of grease, garbage, flammable wastes, sand, or other ingredients that affect the operation of a private sewage disposal system, an interceptor for such wastes shall be installed.

H 901.2 Installation. Installation of such interceptors shall comply with Section 1009.0 of this code, and their location shall comply with Table H 101.8 of this appendix.

H 901.3 Sampling Box. A sampling box shall be installed where required by the Authority Having Jurisdiction.

H 901.4 Design and Structural Requirement. Interceptors shall be of approved design and be not less than two compartments. Structural requirements shall comply with Section H 501.0 of this appendix.

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APPENDIX H

H 901.5 Location. Interceptors shall be located as close to the source as possible and be accessible for servicing. Necessary manholes for servicing shall be at grade level and be gastight.

H 901.6 Waste Discharge. Waste discharge from interceptors shall be permitted to be connected to a septic tank or other primary system or be disposed into a separate disposal system.

H 901.7 Design Criteria. A formula shall be permitted to be adapted to other types of occupancies with similar wastes. (See Chart H 901.7)

H 1001.0 Inspection and Testing.

H 1001.1 Inspection. Inspection requirements shall comply with the following:

(1) Applicable provisions of Section 105.0 of this code and this appendix shall be required. Plans shall be required in accordance with Section 103.3 of this code.

(2) System components shall be properly identified as to manufacturer. Septic tanks or other primary systems shall have the rated capacity permanently marked on the unit.

(3) Septic tanks or other primary systems shall be installed on dry, level, well-compacted soil.

(4) Where design is predicated on soil tests, the system shall be installed at the same location and depth as the tested area.

H 1001.2 Testing. Testing requirements shall comply with the following:

(1) Septic tanks or other primary components shall be filled with water to flow line before requesting an inspection. Seams or joints shall be left exposed (except the bottom), and the tank shall remain watertight.

(2) A flow test shall be performed through the system to the point of effluent disposal. All lines and components shall be watertight. Capacities required air space, and fittings shall comply with the provisions outlined in this appendix.

H 1101.0 Abandoned Sewers and Sewage Disposal Facilities.

H 1101.1 Plugged and Capped. An abandoned building (house) sewer, or part thereof, shall be plugged or capped in an approved manner within 5 feet (1524 mm) of the property line.

H 1101.2 Fill Material. A cesspool, a septic tank, or a seepage pit that has been abandoned or has been discontinued otherwise from further use, or to which no waste or soil pipe from a plumbing fixture is connected, shall have the sewage removed therefrom and be completely filled with the earth, sand, gravel, concrete, or other approved material.

H 1101.3 Filling Requirements. The top cover or arch over the cesspool, septic tank, or seepage pit shall be removed before filling, and the filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection has been called and the cesspool, septic tank, or seepage pit has been inspected. After such inspection, the cesspool, septic tank, or seepage pit shall be filled to the level of the top of the ground.

H 1101.4 Owner. No person owning or controlling a cesspool, septic tank, or seepage pit on the premises of such person or in that portion of any public street, alley, or other

CHART H 901.7
RECOMMENDED DESIGN CRITERIA

GREASE AND GARBAGE, COMMERCIAL KITCHENS											
Number of meals per peak hour	x	Waste flow rate[1]	x	Retention time[2]	x	Storage factor[3]	=	Interceptor size (liquid capacity)			
SAND-SILT OIL, AUTO WASHERS											
Number of vehicles per hour	x	Waste flow rate[1]	x	Retention time[2]	x	Storage factor[3]	=	Interceptor size (liquid capacity)			
SILT-LINT GREASE, LAUNDRIES, LAUNDROMATS											
Number of machines	x	2 cycles per hour	x	Waste flow rate[1]	x	Retention time[2]	=	Storage factor[3]	=	Intereeptor size (liquid capacity)	

Notes:

1 For waste flow rate see Table H 201.1(4).

2 Retention Times:
- (a) Kitchen (commercial) – with dishwasher, garbage disposal, or both = 2.5 hours
- (b) Kitchen (single service) – with garbage disposal = 1.5 hours
- (c) Auto Washers (sand-silt oil) = 2.0 hours
- (d) Laundries/Laundromats = 2.0 hours

3 Storage Factors:
- (a) Kitchen (commercial) – with 8 hours operation = 1
- (b) Kitchen (commercial) – with 16 hours operation = 2
- (c) Kitchen (commercial) – with 24 hours operation = 3
- (d) Kitchen (single service) = 1.5
- (e) Auto Washers (sand-silt oil) – with self service = 1.5
- (e) Auto Washers (sand-silt oil) – with employee operated = 2
- (d) Laundries/Laundromats – with rock filter = 1.5 hours

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public property abutting such premises shall fail, refuse, or neglect to be in accordance with the provisions of this section or upon receipt of notice so to be in accordance with the Authority Having Jurisdiction.

H 1101.5 Permittee. Where disposal facilities are abandoned consequent to connecting any premises with the public sewer, the permittee making the connection shall fill all abandoned facilities in accordance with the Authority Having Jurisdiction within 30 days from the time of connecting to the public sewer.

H 1201.0 Drawings and Specifications.

H 1201.1 General. The Authority Having Jurisdiction, Health Officer, or other department having jurisdiction shall be permitted to require the following information before a permit is issued for a private sewage disposal system or at a time during the construction thereof:

(1) Plot plan drawn to scale, completely dimensioned, showing direction and approximate slope of surface, location of present or proposed retaining walls, drainage channels, water supply lines or wells, paved areas and structures on the plot, number of bedrooms or plumbing fixtures in each structure, and location of the private sewage disposal system with relation to lot lines and structures.

(2) Details of construction necessary to ensure compliance with the requirements of this appendix together with a full description of the complete installation including quality, kind, and grade of materials, equipment, construction, workmanship, and methods of assembly and installation.

(3) A log of soil formations and groundwater levels as determined by test holes dug in close proximity to a proposed seepage pit or disposal field, together with a statement of water absorption characteristics of the soil at the proposed site, as determined by approved percolation tests.

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