Appendix 5.12

Wastewater

Appendix 5.12a

Wastewater Generation Memo

DEXTER WILSON ENGINEERING, INC.

DEXTER S. WILSON, P.E.
ANDREW M. OVEN, P.E.
NATALIE J. FRASCHETTI, P.E.
STEVEN J. HENDERSON, P.E.
FERNANDO FREGOSO, P.E.
KATHLEEN L. HEITT, P.E.

MEMORANDUM **721-460**

TO: **Alex Herrell, FivePoint**

FROM: **Natalie Fraschetti, P.E., Dexter Wilson Engineering, Inc.**

DATE: **September 30, 2022**

SUBJECT: **Santa Clarita Valley Sanitation District (SCVSD) Wastewater Generation Estimates for Entrada South and Valencia Commerce Center**

The Entrada South and Valencia Commerce Center project is within the sphere of influence of the Santa Clarita Valley Sanitation District. Most of the Valencia Commerce Center is within the boundary/service area and the remainder will require annexation, while all of the Entrada South portion of the project will need to be annexed into the Santa Clarita Valley Sanitation District (SCVSD) service area. Table 1 below presents the estimate of wastewater flows anticipated to be generated by the currently proposed project (Modified Project). Table 1 also provides a comparison of wastewater flows against the 2017 Approved Project.

The remainder of the technical memorandum following Table 1 provides the background information utilized to prepare Table 1.

2234 FARADAY AVENUE • CARLSBAD, CA 92008 • (760) 438-4422 • FAX (760) 438-0173

TABLE 1 PROJECT WASTEWATER GENERATION			
Land Use	**Dwelling Units/Square Footage**	**Daily Generation Rate [1]**	**Average Daily Flow (Gallons per day)**
Entrada South (2017 Approved Project)			
Residential	1,725 units	215 gal/DU [2]	372,125
Commercial	450,000 sf	276 gal/1,000 sf [3]	124,200
Subtotal			**496,325**
Entrada South (Modified Project)			
Residential	1,574 units	195 gal/DU	306,930
Commercial	730,000 sf	276 gal/1,000 sf [3]	324,043
Subtotal			**630,973**
Valencia Commerce Center (Approved Project and Modified Project)			
Light Industrial/Business Park	3,400,000 sf	286 gal/1,000 sf [4]	973,220
Subtotal			**973,320**
Total for the 2017 Approved Project			**1,469,545**
Total for the Modified Project			**1,604,193**
Difference			**134,648**

[1] Daily generation rates are derived from SCVSD adopted ordinance generation rates for the proposed land use.
[2] Average of residential wastewater generation rates based on proposed residential products and current SCVSD generation rates (260 gpd/DU for detached products and 195 gpd/EDU for attached products). Residential generation rates in the 2017 Approved Project versus Modified Project vary based on differing mix in residential product types.
[3] Average of commercial wastewater generation rates based on Proposed Project uses and current SCVSD generation rates (Retail at 325 gpd/1000 sf, Office at 300 gpd/1000 sf, and Hotel at 125 gpd/room). The Modified Project rate is applied to 2017 Approved Project for comparison purposes.
[4] Average of commercial wastewater generation rates based on Proposed Project uses and current SCVSD generation rates (Retail at 325 gpd/1000 sf, Office at 300 gpd/1000 sf, and Light Industrial at 200 gpd/1000 sf) The Modified Project rate is applied to 2017 Approved Project for comparison purposes.

ENTRADA SOUTH LAND USE

The proposed Entrada South project is a mix of residential and commercial development. Table 2 summarizes the mix of land uses within the project. The basis of the land use summary is the project's Exhibit A.

TABLE 2
ENTRADA SOUTH LAND USE

Land Use Type	Units/Square Footage
Residential – 1,574 Units	
Residential (Condo)	1,574 Units
Commercial – 730,000 sf	
Retail	105,425 sf
Office	459,575 sf
Hotel	500 Rooms (165,000 sf)
School	750 Students
Park/Rec Center	1,500 sf

VALENCIA COMMERCE CENTER LAND USE

The proposed Valencia Commerce Center project is a mix of commercial and light industrial development. Table 3 summarizes the mix of land uses within the project. The basis of the land use summary is the project's Exhibit A.

TABLE 3
VALENCIA COMMERCE CENTER LAND USE

Land Use Type	Square Footage
Commercial – 3,400,000 sf	
Retail	18,000 sf
Office	2,909,700 sf
Light Industrial	472,300 sf

WASTEWATER FLOW GENERATION RATES

Wastewater generation rates for this analysis are based on the regional wastewater treatment provider, SCVSD. Table 4 summarizes the wastewater generation rates utilized in this analysis as extracted from the SCVSD's Connection Fee Rate and Mean Loading Ordinance, a copy of which is provided in Attachment 3. In addition to the wastewater generation rate assumed for each land use type (in gallons per day), Table 4 also articulates which specific generation rate category from the SCVSD Ordinance is applied to each land use type within the two proposed projects.

TABLE 4
WASTEWATER GENERATION RATES

Land Use Type	Assigned SCVSD Land Use Type	Wastewater Generation Rate
Residential		
Detached	Condominium	195 gpd/Unit
Attached	Condominium	195 gpd/Unit
Commercial		
Retail	Shopping Center	325 gpd/1,000 sf
Office	Professional Office	300 gpd/1,000 sf
Hotel	Hotel/Motel	125 gpd/Room
Light Industrial	Manufacturing	200 gpd/1,000 sf
Park/Rec Center	Office Building	200 gpd/1,000 sf
School	School	200 gpd/1,000 sf

Table 5 summarizes the wastewater anticipated to be generated by Entrada South based on the proposed land use for each planning area. Table 6 provides the same for Valencia Commerce Center, with the combined total for the project in Table 7.

TABLE 5 ENTRADA SOUTH WASTEWATER GENERATION DETAIL			
Land Use Type	**Units/Square Footage**	**Wastewater Generation Rate**	**Wastewater Generation, gpd**
Residential			
Residential (Condo)	1,574 Units	195 gpd/unit	306,930
Commercial			
Retail	105,425 sf	325 gpd/1,000 sf	34,263
Office	459,575 sf	300 gpd/1,000 sf	137,873
Hotel	500 Rooms (165,000 sf)	125 gpd/room	62,500
School	750 Students 10.3 ac	200 gpd/1,000 sf	89,107
Park/Rec Center	1,500 sf	200 gpd/1000 sf	300
Subtotal Commercial	730,000 sf	-	324,043
TOTAL	**-**	**-**	**630,973**
		Average gpd/1,000 sf →	276

TABLE 6 VALENCIA COMMERCE CENTER WASTEWATER GENERATION DETAIL			
Land Use Type	**Square Footage**	**Generation Rate**	**Wastewater Generation, gpd**
Retail	18,000 sf	325/1000 sf	5,850
Office	2,909,700 sf	300 gpd/100 sf	872,910
Light Industrial	472,300 sf	200/100 sf	94,460
TOTAL	**3,400,000 sf**	**-**	**973,220**
		Average gpd/1,000 sf →	286

TABLE 7 PROJECT WASTEWATER GENERATION			
Land Use	**Units/Square Footage**	**Daily Generation Rate**	**Average Daily Flow, gpd**
Entrada South			
Residential	1,574 units	195 gal/DU [1]	306,930
Commercial	730,000 sf [3]	276 gal/1,000 sf [1]	324,043
Total Entrada South			**630,973**
Valencia Commerce Center			
Light Industrial/Business Park	3,400,000 sf	286 gal/1,000 sf [2]	973,220
Total Valencia Commerce Center			**973,220**
TOTAL PROJECT			**1,604,193**

[1] Per Table 5.

[2] Per Table 6.

[3] Approximately 1,175,620 sf with the school parcel.

COMPARISON TO 2017 APPROVED PROJECT

For both Entrada South and Valencia Commerce Center, the currently proposed project is a modification to that previously approved in 2017; however, from a wastewater generation perspective, changes are only anticipated for Entrada South. Table 8 summarizes the approved land use and wastewater generation under the 2017 project with a comparison to the current project proposed.

TABLE 8 2017 APPROVED PROJECT AND WASTEWATER GENERATION			
Land Use	**Dwelling Units/Square Footage**	**Daily Generation Rate**	**Average Daily Flow, gpd**
Entrada South			
Residential	1,725 units	215 gal/Unit [1]	372,125
Commercial	450,000 sf	276 gal/1,000 sf [2]	124,200
Total Entrada South			**496,325**
Valencia Commerce Center			
Light Industrial/Business Park	3,400,000 sf	286 gal/1,000 sf [3]	973,220
Total Valencia Commerce Center			**973,220**
TOTAL 2017 Approved Project			**1,469,545**
TOTAL Modified Project			**1,604,193**
Difference (Modified – 2017 Approved)			**134,648**

[1] Based on an assumed 550 units of detached and 1,175 units of attached per FivePoint; where detached generates 260 gpd/unit and attached generates 195 gpd/unit.
[2] Per Table 5. The Modified Project rate is applied to 2017 Approved Project for comparison purposes.
[3] Per Table 6. The Modified Project rate is applied to 2017 Approved Project for comparison purposes.

NF:ah

ATTACHMENT 1

WILL SERVE LETTERS

LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

April 28, 2022

Ref. DOC 6498322

VIA EMAIL JMowrey@hunsaker.com

Ms. Jeannine Mowrey, Principal
Hunsaker & Associates
26074 Avenue Hall #23
Valencia, CA 91355

Dear Ms. Mowrey:

Will Serve Letter for VTTM 53295 Entrada South

The Santa Clarita Valley Sanitation District (District) received your will serve letter request for the subject project on March 25, 2022. We offer the following comments regarding sewerage service:

1. A portion of the project area is outside the jurisdictional boundaries of the District and will require annexation into the District before sewerage service can be provided to the proposed development. For a copy of the District's Annexation Information and Processing Fee sheets, go to www.lacsd.org, under Services, then Wastewater Program and Permits and select Annexation Program. For more specific information regarding the annexation procedure and fees, please contact Ms. Donna Curry at (562) 908-4288, extension 2708.

2. Due to the project's location, the flow originating from the proposed project would have to be transported to the District's trunk sewer by local sewer(s) that are not maintained by the District. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or District's trunk sewer. The nearest District's trunk sewer is the District 32 Main Trunk Sewer, located in The Old Road at Magic Mountain Parkway. The District's 30–inch diameter trunk sewer has a capacity of 16.1 million gallons per day (mgd) and conveyed a peak flow of 1.6 mgd when last measured in 2018.

3. The District operates two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The SCVJSS has a capacity of 28.1 mgd and currently processes an average flow of 19.6 mgd.

4. The expected average wastewater flow from the project site, described in the request as 1,574 condominium units; 730,000 square feet of non-residential mixed-use retail, office development, and hotel uses; a neighborhood park, and potential school site, is 630,973 gallons per day. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, under Services, then Wastewater Program and Permits, select Will Serve Program, and scroll down to click on the Table 1, Loadings for Each Class of Land Use link.

5. The District is empowered by the California Health and Safety Code to charge a fee to connect facilities (directly or indirectly) to the District's Sewerage System or to increase the strength or quantity of wastewater discharged from connected facilities. This connection fee is used by the District for its capital facilities. Payment of a connection fee may be required before this project is permitted to discharge to the District's Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, under Services, then Wastewater (Sewage) and select Rates & Fees. In determining the impact to the Sewerage System and applicable connection fees, the District will determine the user category (e.g. Condominium, Single Family home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, the developer should contact the District's Wastewater Fee Public Counter at (562) 908-4288, extension 2727.

6. In order for the District to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the District's wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of District's facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the District's treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise the developer that the District intends to provide this service up to the levels that are legally permitted and to inform the developer of the currently existing capacity and any proposed expansion of District's facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2743, or mandyhuffman@lacsd.org.

Very truly yours,

Mandy Huffman

Mandy Huffman
Environmental Planner
Facilities Planning Department

MNH:mnh

cc: D. Curry
A. Howard
A. Schmidt
Matt Carpenter, Matt.Carpenter@fivepoint.com

DOC 6527543.SCVD99

LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager
1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

April 28, 2022

Ref. DOC 6498319

VIA EMAIL JMowrey@hunsaker.com

Ms. Jeannine Mowrey, Principal
Hunsaker & Associates
26074 Avenue Hall #23
Valencia, CA 91355

Dear Ms. Mowrey:

Will Serve Letter for VTPM 18108

The Santa Clarita Valley Sanitation District (District) received your will serve letter request for the subject project on March 25, 2022. We offer the following comments regarding sewerage service:

1. A portion of the project area is outside the jurisdictional boundaries of the District and will require annexation into the District before sewerage service can be provided to the proposed development. For a copy of the District's Annexation Information and Processing Fee sheets, go to www.lacsd.org, under Services, then Wastewater Program and Permits and select Annexation Program. For more specific information regarding the annexation procedure and fees, please contact Ms. Donna Curry at (562) 908-4288, extension 2708.

2. A portion of the proposed project may require a Districts' permit for Industrial Wastewater Discharge. Project developers should contact the Districts' Industrial Waste Section at (562) 908-4288, extension 2900, in order to reach a determination on this matter. If this permit is necessary, project developers will be required to forward copies of final plans and supporting information for the proposed project to the Districts for review and approval before beginning project construction. For additional Industrial Wastewater Discharge Permit information, go to https://www.lacsd.org/services/wastewater-programs-permits/industrial-waste-pretreatment-program/industrial-wastewater-discharge-permits.

3. Due to the project's location, the flow originating from the proposed project would have to be transported to the District's trunk sewer by local sewer(s) that are not maintained by the District. If no local sewer lines currently exist, it is the responsibility of the developer to convey any wastewater generated by the project to the nearest local sewer and/or District's trunk sewer. The following is a list of Districts' trunk sewer that serves the project area:

Name	Location	Size (dia.)*	Capacity (mgd)**	Peak Flow (mgd)	Last Measured
Castaic Trunk	Hasley Canyon Road at The Old Road	15	3.0	1.5	2018
Castaic Trunk	The Old Road at Biscailuz Drive	21	3.7	1.6	2018
Castaic Trunk	The Old Road at Turnberry Lane	24	5.5	1.0	2018
Castaic Trunk	The Old Road, south of Turnberry Lane	24	6.7	1.0	2018

*diameter in inches
**million gallons per day

4. The District operates two water reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, which provide wastewater treatment in the Santa Clarita Valley. These facilities are interconnected to form a regional treatment system known as the Santa Clarita Valley Joint Sewerage System (SCVJSS). The SCVJSS has a capacity of 28.1 mgd and currently processes an average flow of 19.6 mgd.

5. The expected average wastewater flow from the project site, described in the request as 18,000 square feet of retail use, 2,909,700 square feet of office use, and 472,300 square feet of industrial use, is 973,220 gallons per day. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, under Services, then Wastewater Program and Permits, select Will Serve Program, and scroll down to click on the Table 1, Loadings for Each Class of Land Use link.

6. The District is empowered by the California Health and Safety Code to charge a fee to connect facilities (directly or indirectly) to the District's Sewerage System or to increase the strength or quantity of wastewater discharged from connected facilities. This connection fee is used by the District for its capital facilities. Payment of a connection fee may be required before this project is permitted to discharge to the District's Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, under Services, then Wastewater (Sewage) and select Rates & Fees. In determining the impact to the Sewerage System and applicable connection fees, the District will determine the user category (e.g. Condominium, Single Family Home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, the developer should contact the District's Wastewater Fee Public Counter at (562) 908-4288, extension 2727. If an Industrial Wastewater Discharge Permit is required, connection fee charges will be determined by the Industrial Waste Section.

7. In order for the District to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the District's wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of District's facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the District's treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise the developer that the District intends to provide this service up to the levels that are legally permitted and to inform the developer of the currently existing capacity and any proposed expansion of District's facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2743, or mandyhuffman@lacsd.org.

Very truly yours,

Mandy Huffman

Mandy Huffman
Environmental Planner
Facilities Planning Department

MNH:mnh

cc: D. Curry
A. Howard
A. Schmidt
L. Smith
Matt Carpenter, Matt.Carpenter@fivepoint.com

DOC 6527542.SCVD99

Appendix 5.12b

Entrada South Sewer Area Study

Sewer Area Study
Proposed Conditions
for
VTTM 53295
Newhall Ranch – Entrada South
PC 12056AS
ESTU2022000057

County of Los Angeles

SEWER AREA STUDY
APPROVED

REVIEWED BY:__________ DATE 12/27/2022

APPROVED BY:__________ DATE 12/28/2022

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

THIS APPROVAL EXPIRES TWO YEARS FROM THE DATE OF APPROVAL

Hunsaker Project No: 0015-035-036
November 29, 2022

Prepared for:

FIVEPOINT
25124 Springfield Court Suite 300
Valencia, CA 91355

Prepared by:

Alireza Sazegari
Hunsaker and Associates, LA Inc.
26074 Avenue Hall, Suite 23
Valencia, CA 91355
Telephone: (661) 294-2211 Fax: (661) 294-9890
Under the direction of

REGISTERED PROFESSIONAL ENGINEER
JASON H. FUKUMITSU
No. 40695
CIVIL
STATE OF CALIFORNIA

Jason H. Fukumitsu RCE 40695 Exp. 03/31/2023

TABLE OF CONTENTS

1. INTRODUCTION

The purpose of this report is to provide sewer main sizing and sewer routing options for the proposed Entrada South (VTTM 53295) development.

The subject project is located in unincorporated Los Angeles County at the intersection of Magic Mountain Parkway and The Old Road.

The site is bounded by other planned developments including Mission Village (AVTTM 61105) to the west and Entrada North (VTTM 71377) to the north. Off-site sewer flows enter the site from Mission Village (AVTTM 61105). Flows from the site travel to PC 12220B and PC 12220E. From there the flow travels east along Magic Mountain Parkway then north along The Old Road to the Valencia Water Reclamation Plant.

2. PROJECT LAND USE AND TOPOGRAPHY

The proposed Entrada South (VTTM 53295) will include hotel, park, residential, mixed used, commercial, and recreational land uses. Only areas that would contribute towards sewage generation were included in the sewer area study analysis.

A breakdown of the various land use within the proposed development and its area can be found in Table 1 in Appendix A. Each land use type has a corresponding sewer generation coefficient which was used in the analysis. These coefficients can be found in Table 2.

Where information is available, the number of dwelling units is used to calculate the sewer flow. Otherwise, the acres zoned for a specific land use is used with the appropriate acre-based sewer generation factor.

3. METHODOLOGY

The project was divided into 5 tributary study areas, with most areas being further divided into sub-areas based on land use. Exhibit 2: Entrada South Sewer Tributary Area Exhibit in Appendix C shows these study areas. Each tributary area was delineated based on the proposed topography of the site and the proposed sewer drainage system.

Sewer generated discharges were computed as a product of the zoning coefficients and the land use data (acres or dwelling units). Land use data was compiled based on an area calculation of each tributary area and the dwelling units for applicable commercial and multi-family residential areas see Exhibit 3: Entrada-Cumulative VTTM 53295 GIS Land Use Map in Appendix C. Sewage generation factors were based on the Los Angeles Department of Public Works zoning coefficients for private contract sewer projects. Table 3 shows the calculations for the sewer discharges from each tributary area to be used in pipe sizing calculations.

Tabulated flows from each tributary area are combined and routed through the project site, see Exhibit 1: Entrada South Sewer Area Study Map in Appendix C. The pipe size is determined by design Q and design pipe slope. The design Q is calculated based upon the higher value of either zoning or occupancy. The design pipe slope is generally established to correspond to the minimum street grade in a given sewer reach. The capacity of the design pipe is calculated to ensure the pipe is sufficient to carry the design Q. A minimum pipe slope is determined by given pipe size and design Q while pipe is in half-full condition. By determining the design pipe slope and minimum pipe slope, this will allow for minor adjustments on the final engineering plan due to unforeseen conditions. The design sizes and slopes for individual sewer segments are shown in Table 4 of Appendix A. Exhibit 1 in Appendix C identifies the nodes and lot numbers listed in the sewer routing system referred to within Table 4.

4. SEWER TRIBUTARY AREAS

The Entrada South Sewer Area Study (VTTM 53295) has 5 tributary areas: A, B, C, D, and E. Subareas A-E will drain to The Old Road (32-p-0003) and travel north to the Valencia Wastewater Reclamation Plant.

Tributary Area A:

The subject area is located on the western side of the project. Flows from this area drain westerly into an existing sewer line-PC 12220B. Area A consists of multi-family, and open space lots. The existing pipe, PC 12220B, is designed for Mission Village (AVTTM 61105) and for Entrada South (VTTM 53295). There are entry points from Mission Village and Entrada's, as annotated on the Entrada South Sewer Area Study Map in Exhibit 1 of Appendix C. The capacity of this existing line was analyzed in Table 4 for Area A.

Tributary Area B:

The subject area is located northeast of Area A and south of Magic Mountain Parkway. Flows from this area drain easterly and northerly then enter an existing sewer line-PC 12220E. The capacity of this existing line was analyzed in Table 4 for Area B. Area B consists of multi-family, mixed use, commercial and recreational lots.

Tributary Area C:

The subject area is located on the northern side of the project-north of Magic Mountain Parkway. Flows from this area drain southerly into an existing sewer line-PC 12220E. The capacity of this existing line was analyzed in Table 4 for Area C. Area C consists of hotel and commercial lots.

Tributary Area D:

The subject area is located in the center of the project. Flows from this area drain easterly and northerly into an existing sewer line-PC 12220E. The capacity of this existing line was analyzed in Table 4 for Area D. Area D consists of park, recreational and multi-family lots.

Tributary Area E:

The subject area is located on the eastern side of the project-south of an existing gas station. This gas station is located at the southwestern corner of Magic Mountain Parkway and The Old Road. Flows from this area drain easterly into an existing sewer line-PC 11839. The capacity of this existing line was analyzed in Table 4 for Area E. Area E consists of commercial lot.

5. CONCLUSIONS AND RECOMMENDATIONS

Pipe sizing and slopes for individual sewer segments are listed in Table 4: Sewer Flow Calculation Summary in Appendix A. There is no impact to existing sewer lines and therefore no existing pipes need to be upsized. These sewer pipes were already sized to accommodate flow from Mission Village (AVTTM 61105). Table 4 shows that the capacities of PC 12220B and PC 12220E are able to receive the flow from Entrada South (VTTM 53295) and are sufficient.

6. REFERENCES

- Los Angeles County Design & Supporting Data Manual
  - Chapter 46: Private Contract Sewer General Notes
  - Chapter 47: Sewer Area Study
- SMD Maps: N-1256
- Rating Table for Sewer Pipe
- Existing Sewer Plans: PC 12220B, PC 12220E, PC 11839

APPENDIX A - TABLES

VTTM 53295: Entrada South, Sewer Area Study

Table 1: Land Use Statistics

Land Use	Area (ac)
Commercial/Business Park	49.52
Multi Family Condominum	136.26
Private Park	5.36
Recreation	3.24

VTTM 53295: Entrada South, Sewer Area Study

Table 2: Sewage Generation Coefficients

Land Use	Sewer Generation Coefficient By Zoning (cfs/ac)
Commercial	0.015
Park	0.001
Recreation	0.001*
Land Use	**Sewer Generation Coefficient By Zoning (cfs/du)**
Estate	0.0015
SFD/Multi-Family Condo.	0.012
Land Use	**Sewer Generation Coefficient By Occupancy (gal/1000sf.day)**
Commercial	100
Office Building	200
Parking Structure	25
3-Bedroom or more	300 (gal/unit)

*Park Coefficient is used for Recreation Outdoor Facility

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area A

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (du)				
A1	84-86, 88	PA-5a	MULTI-FAMILY	3.68	0.012		25	300	0.044	0.029	0.044
A2	81-83	PA-5a	MULTI-FAMILY	6.64	0.012		45	300	0.080	0.052	0.080
A3	61-70, 59	PA-10a & b	MULTI-FAMILY	12.65	0.012		115	300	0.152	0.133	0.152
A4	55-58	PA-4f	MULTI-FAMILY	5.06	0.012		89	300	0.061	0.103	0.103
A5	38-39	PA-4c	MULTI-FAMILY	2.41	0.012		48	300	0.029	0.056	0.056

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area B

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
B1 C	41	PA-4b	MU-COMMERCIAL	3.28	0.015	17,025		100	0.049	0.007	0.049
B1 R	41	PA-4b	MU-RESIDENTIAL	3.28	0.012		92	300	0.039	0.107	0.107
B2	51, 54	PA-4d	MULTI-FAMILY	4.03	0.012		84	300	0.048	0.097	0.097
B3	37, 40	PA-4a	MULTI-FAMILY	1.44	0.012		22	300	0.017	0.026	0.026
B4	44, 45	PA-4a	MULTI-FAMILY	2.33	0.012		30	300	0.028	0.035	0.035
B5	48-50 52-53	PA-4e	MULTI-FAMILY	6.92	0.012		105	300	0.083	0.122	0.122
B6	46-47	PA-4a	MULTI-FAMILY	3.23	0.012		42	300	0.039	0.049	0.049
B7	30		RECREATION	1.71	0.001				0.002		0.002

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5
[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area C

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day) (gal/room)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
C1	17-19	PA-1	COMMERCIAL	6.81	0.015	72,666		200	0.102	0.056	0.102
C2	20-23	PA-1	COMMERCIAL	12.73	0.015	222,234		200	0.191	0.172	0.191
C3 H	25-27	PA-2	MU-HOTEL	6.26	0.015		220	150	0.094	0.128	0.128
C3 C	9,10,11,12, 13,14	PA- 3	MU-COMMERCIAL	14.57	0.015	213,925		200	0.219	0.165	0.219

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area D

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
D1	89-91	PA-5b	MULTI-FAMILY	4.28	0.012		34	300	0.051	0.039	0.051
D2	111-112	PA-8b	MULTI-FAMILY	3.10	0.012		24	300	0.037	0.028	0.037
D3	115-118	PA-8c	MULTI-FAMILY	4.27	0.012		52	300	0.051	0.060	0.060
D4	92-94	PA-5c	MULTI-FAMILY	4.80	0.012		39	300	0.058	0.045	0.058
D5	129-131	PA-7c	MULTI-FAMILY	6.49	0.012		57	300	0.078	0.066	0.078
D6	113-114	PA-8a	MULTI-FAMILY	2.93	0.012		26	300	0.035	0.030	0.035
D7	97-102	PA-6a	MULTI-FAMILY	3.08	0.012		30	300	0.037	0.035	0.037
D8	103-104	PA-6b	MULTI-FAMILY	3.22	0.012		26	300	0.039	0.030	0.039
D9	119-120	PA-8d	MULTI-FAMILY	3.31	0.012		26	300	0.040	0.030	0.040
D10 P	161	PARK	PARK/REC	5.36	0.001				0.005		0.005
D10 R	135	RECREATION	PARK/REC	1.53	0.001				0.002		0.002
D11	123-128	PA-7a & 7b	MULTI-FAMILY	10.37	0.012		89	300	0.124	0.103	0.124
D12	141-143,146-148	PA-9a & 9b	MULTI-FAMILY	7.92	0.012		116	300	0.095	0.135	0.135
D13	144-145, 149-151	PA-9c & 9d	MULTI-FAMILY	10.47	0.012		110	300	0.126	0.128	0.128
D14	175-180	PA-13b &13c	MULTI-FAMILY	8.47	0.012		104	300	0.102	0.121	0.121
D15	171-173	PA-13a	MULTI-FAMILY	4.88	0.012		68	300	0.059	0.079	0.079
D16	185-187	PA-12a & 12b	MULTI-FAMILY	7.00	0.012		76	300	0.084	0.088	0.088

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area E

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	Q BY ZONING (cfs/ac)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
E1	194	PA-14	COMMERCIAL	2.69	0.015	39,150		200	0.040	0.030	0.040
E2	Exist Lot	-	COMMERCIAL	2.18	0.015				0.033		0.033

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 4: VTTM 53295: Entrada South, Sewer Area Study
Sewer Flow Calculation Summary

AREA A

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
A2	81-83					0.080							
		WESTRIDGE PKWY	#41-#42	8	3.00%		0.080	0.013	0.959		8%	0.4000%	Gravity VCP
		MV (PC 12220D)				1.029							
		COMMERCE CTR DR	#42-#43	12	1.20%		1.109	0.013	1.866		59%	0.4800%	Gravity VCP
A1	84-86, 88					0.044							
		"A" STREET	#45-#46	8	2.50%		0.044	0.013	0.876		5%	0.4000%	Gravity VCP
		"D" STREET	#46-#47	8	4.00%		0.044	0.013	1.108		4%	0.4000%	Gravity VCP
A3	61-70, 59					0.152							
		PRIVATE DRIVE	#47-#48	8	2.00%		0.196	0.013	0.783		25%	0.4000%	Gravity VCP
A4	55-58					0.103							
		PRIVATE DRIVE	#48-#49	8	2.00%		0.299	0.013	0.783		38%	0.4000%	Gravity VCP
A5	38-39					0.056							
		COMMERCE CTR DR	#49-#50	8	2.00%		0.355	0.013	0.783		45%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#50-#43	8	1.00%		0.355	0.013	0.553		64%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#43-#44	12	4.40%		1.464	0.013	3.577		41%	0.7600%	Gravity VCP
		COMMERCE CTR DR	#44-#40	15	1.16%		1.464	0.013	3.391		43%	0.0800%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$
Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA B

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
B1 C + B1 R	41					0.156							
		PRIVATE DRIVE	#60-#61	8	1.720%		0.156	0.013	0.726		21%	0.400%	Gravity VCP
B2	51, 54					0.097							
		PRIVATE DRIVE	#61-#63	8	1.720%		0.253	0.013	0.726		35%	0.400%	Gravity VCP
B3	37, 40					0.026							
		PRIVATE DRIVE	#62-#63	8	1.720%		0.026	0.013	0.726		4%	0.400%	Gravity VCP
		PRIVATE DRIVE	#63-#64	8	1.720%		0.279	0.013	0.726		38%	0.400%	
B4	44, 45					0.035							
		PRIVATE DRIVE	#64-#65	8	1.720%		0.314	0.013	0.726		43%	0.400%	Gravity VCP
B5	48-50 52-53					0.122							
B6	46-47					0.049							
		PRIVATE DRIVE	#65-#66	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
		PRIVATE DRIVE	#66-#69	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
B7	30					0.002							
		B STREET	#67-#69	8	2.930%		0.002	0.013	0.948		0%	0.400%	Gravity VCP
		B STREET	#69-#70	8	2.930%		0.486	0.013	0.948		51%	0.840%	Gravity VCP
		M.M.P	#70-#82	8	2.000%		0.486	0.013	0.783		62%	0.840%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA C

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
C1	17-19					0.102							
		PRIVATE DRIVE	#80-#81	8	1.210%		0.102	0.013	0.609		17%	0.400%	Gravity VCP
C2	20-23					0.191							
		PRIVATE DRIVE	#81-#82	8	0.720%		0.293	0.013	0.469		63%	0.400%	Gravity VCP
		M.M.P	#82-#83	24	1.220%		2.243	0.013		23.032	10%	0.100%	Gravity VCP
C3C + C3H	9,10,11,12,13,					0.346							
		M.M.P	#83-#22	24	1.220%		2.589	0.013		23.032	11%	0.100%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA D

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
D1	89-91					0.051							
		"F" STREET	#1-#2	8	6.000%		0.051	0.013	1.357		4%	0.400%	Gravity VCP
D2	111-112					0.037							
		"F" STREET	#2-#3	8	5.200%		0.089	0.013	1.263		7%	0.400%	Gravity VCP
D3	115-118					0.060							
		"F" STREET	#3-#4	8	6.000%		0.149	0.013	1.357		11%	0.400%	Gravity VCP
D4	92-94					0.058							
		"F" STREET	#4-#5	8	3.600%		0.207	0.013	1.051		20%	0.400%	Gravity VCP
D5	129-131					0.078							
		"G" STREET	#5-#10	8	2.000%		0.284	0.013	0.783		36%	0.400%	Gravity VCP
D6	113-114					0.035							
		"E" STREET	#6-#7	8	5.300%		0.035	0.013	1.275		3%	0.400%	Gravity VCP
D7	97-102					0.037							
		"E" STREET	#7-#8	8	5.200%		0.072	0.013	1.263		6%	0.400%	Gravity VCP
D8	103-104					0.039							
		"G" STREET	#8-#9	8	1.000%		0.111	0.013	0.553		20%	0.400%	Gravity VCP
D9	119-120					0.040							
		"G" STREET	#9-#10	8	1.000%		0.150	0.013	0.553		27%	0.400%	Gravity VCP
		"C" STREET"	#10-#11	8	3.000%		0.435	0.013	0.959		45%	0.680%	Gravity VCP
D10P + D10R	161					0.007							
		"C" STREET"	#11-#12	8	2.800%		0.442	0.013	0.927		48%	0.680%	Gravity VCP
D11	123-128					0.124							
		"C" STREET"	#12-#13	8	1.770%		0.566	0.013	0.736		77%	1.120%	Gravity VCP
D12	141-143, 146-148					0.135							
		"A" STREET	#14-#15	8	0.820%		0.135	0.013	0.501		27%	0.400%	Gravity VCP
D13	144-145, 149-151					0.128							
		"A" STREET	#15-#13	8	2.500%		0.262	0.013	0.876		30%	0.400%	Gravity VCP
		"A" STREET	#13-#18	8	3.300%		0.828	0.013	1.006		82%		Gravity VCP
D14	175-180					0.121							
			#16-#17	8	0.770%		0.121	0.013	0.485		25%	0.400%	Gravity VCP
D15	171-173					0.079							
		"A" STREET	#17-#18	8	1.100%		0.200	0.013	0.580		34%	0.400%	Gravity VCP
		"A" STREET	#18-#20	8	7.500%		1.028	0.013	1.517		68%	3.640%	Gravity VCP
D16	185-187					0.088							
		"H" STREET	#19-#20	8	2.000%		0.088	0.013	0.783		11%	0.400%	Gravity VCP
		"A" STREET	#20-#21	8	5.000%		1.116	0.013	1.239		90%	4.320%	Gravity VCP
		"A" STREET	#21-#22	12	6.000%		1.116	0.013	4.177		27%	0.440%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA E

Tributary Area	LOT Number	Street	Segment	Existing Pipe Size (in)	Exist Pipe Slope[1]	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
E1	194					0.040							
		THE OLD ROAD	E1-#90	8	2.000%		0.040	0.013	0.783		5%	0.400%	Gravity VCP
		THE OLD ROAD	#90-#91	8	1.400%		0.040	0.013	0.655		6%	0.400%	Gravity VCP
E2	Exist Lot					0.033							
		THE OLD ROAD	#91-MH #231	8	1.160%		0.073	0.013	0.596		12%	0.400%	Gravity VCP
		THE OLD ROAD	MH#231-MH#138	8	2.160%		0.073	0.013	0.814		9%	0.400%	Gravity VCP
Existing	Existing					6.190							
		THE OLD ROAD	MH#138-MH#137	15	3.000%		6.263	0.013		10.090	62%	1.200%	Gravity VCP
		THE OLD ROAD	MH#137-Trunk	15	9.960%		6.263	0.013		18.400	34%	1.200%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$
Q_{kutter}=A*C* $(R*S)^{1/2}$

1. Los Angeles County Department of Public Works Area Study Zoning Coefficients

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow
Apartment Buildings:		
Bachelor or Single dwelling units	Apt	150 gal/D.U.
1 bedroom dwelling units	Apt	200 gal/D.U.
2 bedroom dwelling units	Apt	250 gal/D.U.
3 bedroom or more dwelling units	Apt	300 gal/D.U.
Auditoriums, churches, etc.	Aud	5 gal/seat
Automobile parking	P	25 gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20 gal/seat
Commercial Shops & Stores	CS	100 gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500 gal/bed
Hospitals (convalescent)	HC	85 gal/bed
Hotels	H	150 gal/room
Medical Buildings	MB	300 gal/1000 sq ft gross floor area
Motels	MB	150 gal/unit
Office Buildings	Off	200 gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50 gal/seat
Schools:		
Elementary or Jr. High	S	10 gal/student
High Schools	HS	15 gal/student
Universities or Colleges	U	20 gal/student
College Dormitories	CD	85 gal/student

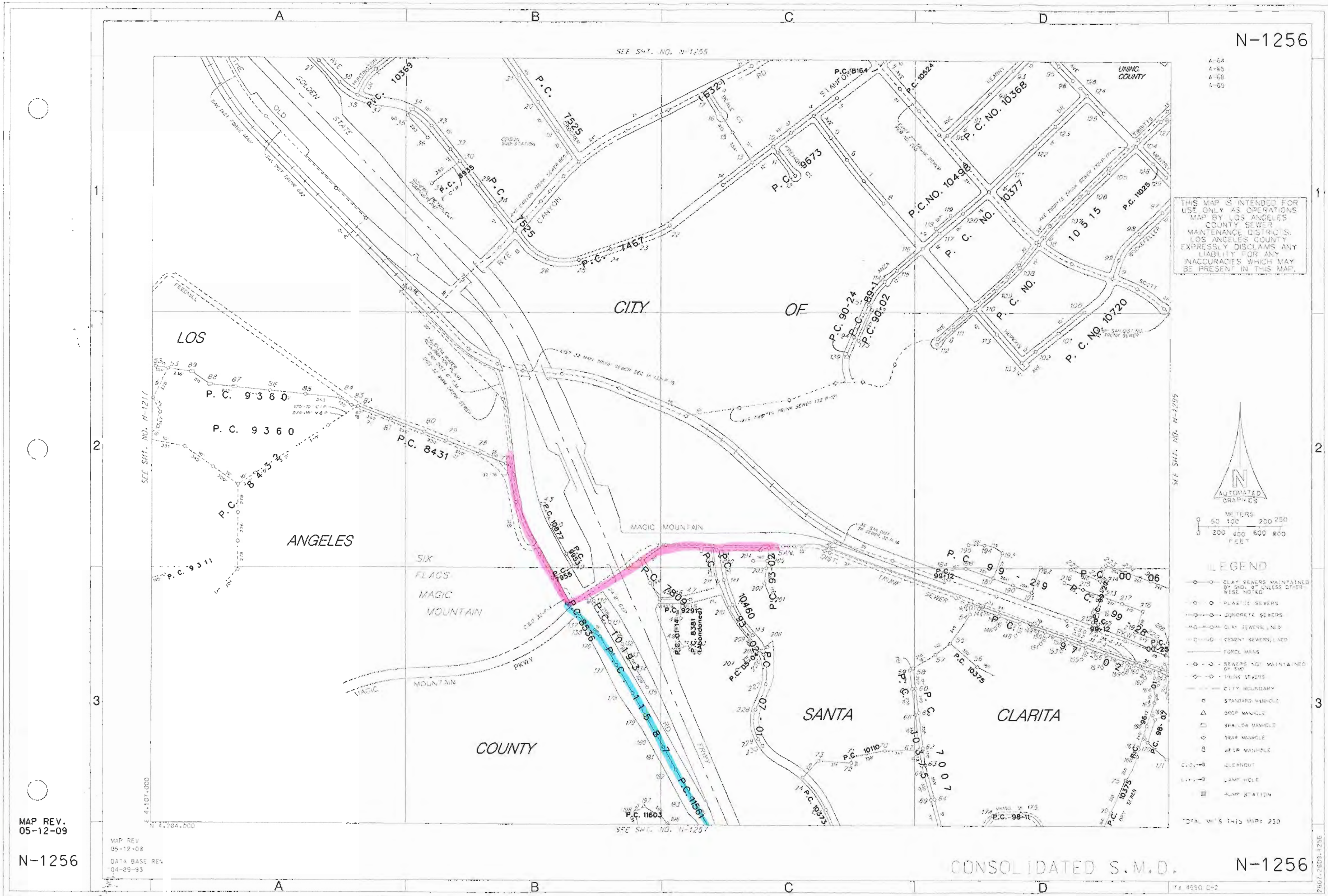
*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture ----------------------------------	0.001
Residential*:	
R-1 --	0.004
R-2 --	0.008
R-3 --	0.012
R-4 --	0.016*
Commercial:	
C-1 through C-4 ----------------------------	0.015*
Heavy Industrial:	
M-1 through M-4 --------------------------	0.021*

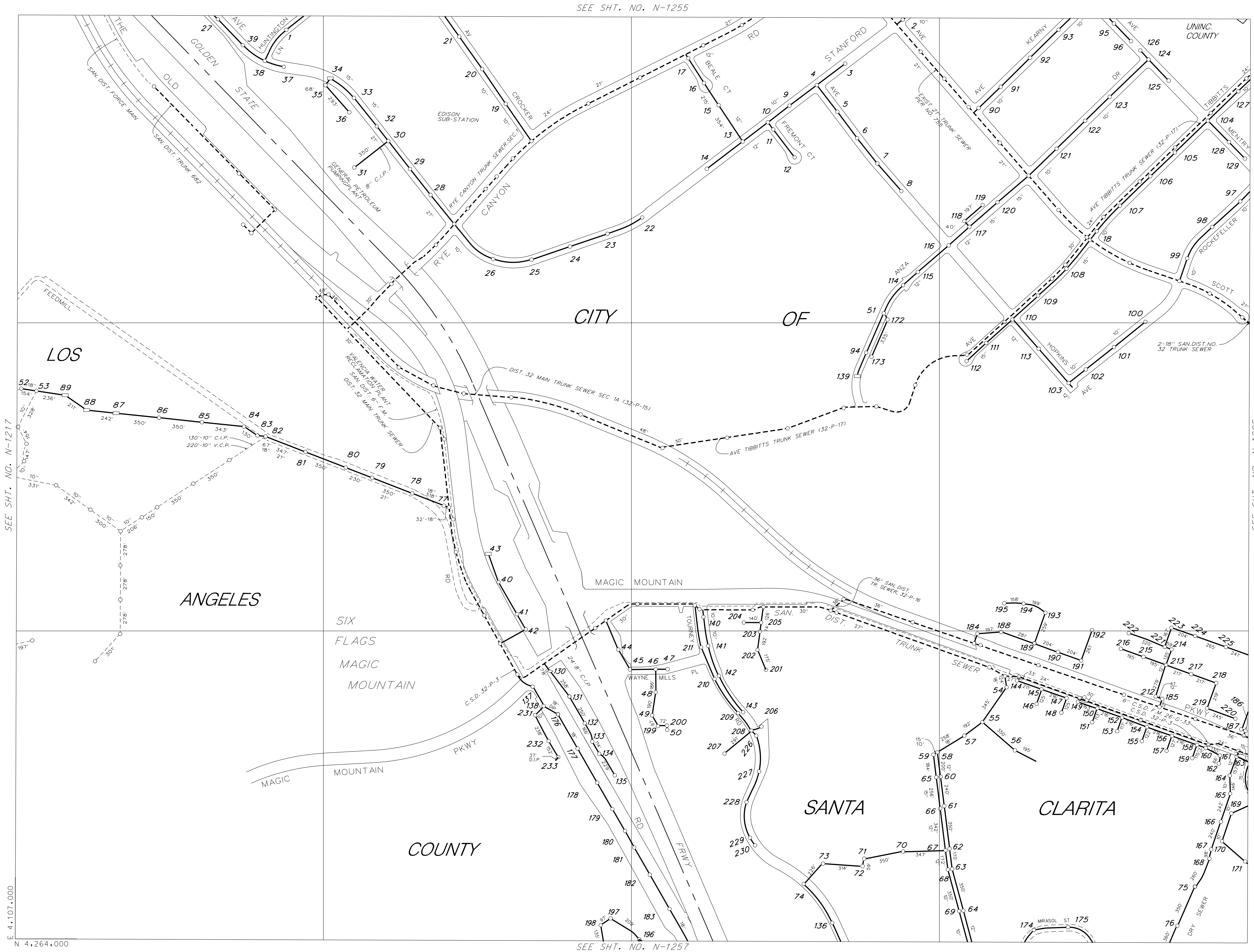
* Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown
* Use 0.001 (cfs/unit) for condominiums only

2. SMD Maps: N-1256



N-1256
SEE SHT. NO. N-1255
UNINC. COUNTY
THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.
CITY OF
LOS ANGELES COUNTY
SANTA CLARITA
SIX FLAGS MAGIC MOUNTAIN
MAGIC MOUNTAIN
MAGIC MOUNTAIN PKWY
THE OLD GOLDEN STATE
P.C. 7525
P.C. 10369
P.C. 8935
P.C. 7467
P.C. 9673
P.C. NO. 10368
P.C. NO. 10498
P.C. NO. 10377
P.C. 10515
P.C. 11025
P.C. NO. 10720
P.C. 9360
P.C. 8431
P.C. 10877
P.C. 8536
P.C. 10193
P.C. 11587
P.C. 11561
P.C. 11603
P.C. 7809
P.C. 9291
P.C. 10460
P.C. 93-02
P.C. 10375
P.C. 10373
P.C. 10110
P.C. 98-11
P.C. 99-12
P.C. 99-28
P.C. 00-06
P.C. 98-07
SEE SHT. NO. N-1257
SEE SHT. NO. N-1217
SEE SHT. NO. N-1295
AUTOMATED GRAPHICS
METERS
FEET
LEGEND
CLAY SEWERS MAINTAINED BY SMD, 8" UNLESS OTHERWISE NOTED
PLASTIC SEWERS
CONCRETE SEWERS
CLAY SEWERS, LINED
CEMENT SEWERS, LINED
FORCE MAINS
SEWERS NOT MAINTAINED BY SMD
TRUNK SEWERS
CITY BOUNDARY
STANDARD MANHOLE
DROP MANHOLE
SHALLOW MANHOLE
TRAP MANHOLE
GRIP MANHOLE
CLEANOUT
LAMP HOLE
PUMP STATION
TOTAL MH'S THIS MAP: 230
MAP REV. 05-12-09
MAP REV 05-12-03
DATA BASE REV 04-29-93
CONSOLIDATED S.M.D.
N-1256

A-64
A-65
A-68
A-69



THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

LEGEND

- CLAY SEWERS MAINTAINED BY SMD. 8" UNLESS OTHERWISE NOTED
- PLASTIC SEWERS
- CONCRETE SEWERS
- CLAY SEWERS, LINED
- CEMENT SEWERS, LINED
- FORCE MAINS
- SEWERS NOT MAINTAINED BY SMD
- TRUNK SEWERS
- CITY BOUNDARY
- STANDARD MANHOLE
- DROP MANHOLE
- SHALLOW MANHOLE
- TRAP MANHOLE
- WEIR MANHOLE
- C.O. CLEANOUT
- L.H. LAMP HOLE
- PUMP STATION

MAP REV
03-30-18

DATA BASE REV
04-29-93

N-1256

CONSOLIDATED S.M.D.

T: 4550 C-2

2607.2609.1256

3. Rating Table For Sewer Pipe

Rating Table for 8 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.33	ft
Diameter	0.66	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00400	0.34	1.98	0.17	1.04	0.66
0.00440	0.36	2.08	0.17	1.04	0.66
0.00480	0.37	2.17	0.17	1.04	0.66
0.00520	0.39	2.26	0.17	1.04	0.66
0.00560	0.40	2.35	0.17	1.04	0.66
0.00600	0.42	2.43	0.17	1.04	0.66
0.00640	0.43	2.51	0.17	1.04	0.66
0.00680	0.44	2.59	0.17	1.04	0.66
0.00720	0.46	2.66	0.17	1.04	0.66
0.00760	0.47	2.74	0.17	1.04	0.66
0.00800	0.48	2.81	0.17	1.04	0.66
0.00840	0.49	2.88	0.17	1.04	0.66
0.00880	0.50	2.95	0.17	1.04	0.66
0.00920	0.52	3.01	0.17	1.04	0.66
0.00960	0.53	3.08	0.17	1.04	0.66
0.01000	0.54	3.14	0.17	1.04	0.66
0.01040	0.55	3.21	0.17	1.04	0.66
0.01080	0.56	3.27	0.17	1.04	0.66
0.01120	0.57	3.33	0.17	1.04	0.66
0.01160	0.58	3.39	0.17	1.04	0.66
0.01200	0.59	3.44	0.17	1.04	0.66
0.01240	0.60	3.50	0.17	1.04	0.66
0.01280	0.61	3.56	0.17	1.04	0.66
0.01320	0.62	3.61	0.17	1.04	0.66
0.01360	0.63	3.67	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01400	0.64	3.72	0.17	1.04	0.66
0.01440	0.65	3.77	0.17	1.04	0.66
0.01480	0.65	3.83	0.17	1.04	0.66
0.01520	0.66	3.88	0.17	1.04	0.66
0.01560	0.67	3.93	0.17	1.04	0.66
0.01600	0.68	3.98	0.17	1.04	0.66
0.01640	0.69	4.03	0.17	1.04	0.66
0.01680	0.70	4.08	0.17	1.04	0.66
0.01720	0.71	4.13	0.17	1.04	0.66
0.01760	0.71	4.17	0.17	1.04	0.66
0.01800	0.72	4.22	0.17	1.04	0.66
0.01840	0.73	4.27	0.17	1.04	0.66
0.01880	0.74	4.31	0.17	1.04	0.66
0.01920	0.75	4.36	0.17	1.04	0.66
0.01960	0.75	4.41	0.17	1.04	0.66
0.02000	0.76	4.45	0.17	1.04	0.66
0.02040	0.77	4.50	0.17	1.04	0.66
0.02080	0.78	4.54	0.17	1.04	0.66
0.02120	0.78	4.58	0.17	1.04	0.66
0.02160	0.79	4.63	0.17	1.04	0.66
0.02200	0.80	4.67	0.17	1.04	0.66
0.02240	0.81	4.71	0.17	1.04	0.66
0.02280	0.81	4.75	0.17	1.04	0.66
0.02320	0.82	4.79	0.17	1.04	0.66
0.02360	0.83	4.84	0.17	1.04	0.66
0.02400	0.83	4.88	0.17	1.04	0.66
0.02440	0.84	4.92	0.17	1.04	0.66
0.02480	0.85	4.96	0.17	1.04	0.66
0.02520	0.85	5.00	0.17	1.04	0.66
0.02560	0.86	5.04	0.17	1.04	0.66
0.02600	0.87	5.08	0.17	1.04	0.66
0.02640	0.87	5.11	0.17	1.04	0.66
0.02680	0.88	5.15	0.17	1.04	0.66
0.02720	0.89	5.19	0.17	1.04	0.66
0.02760	0.89	5.23	0.17	1.04	0.66
0.02800	0.90	5.27	0.17	1.04	0.66
0.02840	0.91	5.31	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02880	0.91	5.34	0.17	1.04	0.66
0.02920	0.92	5.38	0.17	1.04	0.66
0.02960	0.93	5.42	0.17	1.04	0.66
0.03000	0.93	5.45	0.17	1.04	0.66
0.03040	0.94	5.49	0.17	1.04	0.66
0.03080	0.95	5.53	0.17	1.04	0.66
0.03120	0.95	5.56	0.17	1.04	0.66
0.03160	0.96	5.60	0.17	1.04	0.66
0.03200	0.96	5.63	0.17	1.04	0.66
0.03240	0.97	5.67	0.17	1.04	0.66
0.03280	0.98	5.70	0.17	1.04	0.66
0.03320	0.98	5.74	0.17	1.04	0.66
0.03360	0.99	5.77	0.17	1.04	0.66
0.03400	0.99	5.81	0.17	1.04	0.66
0.03440	1.00	5.84	0.17	1.04	0.66
0.03480	1.00	5.87	0.17	1.04	0.66
0.03520	1.01	5.91	0.17	1.04	0.66
0.03560	1.02	5.94	0.17	1.04	0.66
0.03600	1.02	5.97	0.17	1.04	0.66
0.03640	1.03	6.01	0.17	1.04	0.66
0.03680	1.03	6.04	0.17	1.04	0.66
0.03720	1.04	6.07	0.17	1.04	0.66
0.03760	1.04	6.11	0.17	1.04	0.66
0.03800	1.05	6.14	0.17	1.04	0.66
0.03840	1.06	6.17	0.17	1.04	0.66
0.03880	1.06	6.20	0.17	1.04	0.66
0.03920	1.07	6.23	0.17	1.04	0.66
0.03960	1.07	6.27	0.17	1.04	0.66
0.04000	1.08	6.30	0.17	1.04	0.66
0.04040	1.08	6.33	0.17	1.04	0.66
0.04080	1.09	6.36	0.17	1.04	0.66
0.04120	1.09	6.39	0.17	1.04	0.66
0.04160	1.10	6.42	0.17	1.04	0.66
0.04200	1.10	6.45	0.17	1.04	0.66
0.04240	1.11	6.48	0.17	1.04	0.66
0.04280	1.11	6.51	0.17	1.04	0.66
0.04320	1.12	6.55	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04360	1.12	6.58	0.17	1.04	0.66
0.04400	1.13	6.61	0.17	1.04	0.66
0.04440	1.14	6.64	0.17	1.04	0.66
0.04480	1.14	6.67	0.17	1.04	0.66
0.04520	1.15	6.70	0.17	1.04	0.66
0.04560	1.15	6.72	0.17	1.04	0.66
0.04600	1.16	6.75	0.17	1.04	0.66
0.04640	1.16	6.78	0.17	1.04	0.66
0.04680	1.17	6.81	0.17	1.04	0.66
0.04720	1.17	6.84	0.17	1.04	0.66
0.04760	1.18	6.87	0.17	1.04	0.66
0.04800	1.18	6.90	0.17	1.04	0.66
0.04840	1.19	6.93	0.17	1.04	0.66
0.04880	1.19	6.96	0.17	1.04	0.66
0.04920	1.19	6.99	0.17	1.04	0.66
0.04960	1.20	7.01	0.17	1.04	0.66
0.05000	1.20	7.04	0.17	1.04	0.66
0.05040	1.21	7.07	0.17	1.04	0.66
0.05080	1.21	7.10	0.17	1.04	0.66
0.05120	1.22	7.13	0.17	1.04	0.66
0.05160	1.22	7.15	0.17	1.04	0.66
0.05200	1.23	7.18	0.17	1.04	0.66
0.05240	1.23	7.21	0.17	1.04	0.66
0.05280	1.24	7.24	0.17	1.04	0.66
0.05320	1.24	7.26	0.17	1.04	0.66
0.05360	1.25	7.29	0.17	1.04	0.66
0.05400	1.25	7.32	0.17	1.04	0.66
0.05440	1.26	7.35	0.17	1.04	0.66
0.05480	1.26	7.37	0.17	1.04	0.66
0.05520	1.27	7.40	0.17	1.04	0.66
0.05560	1.27	7.43	0.17	1.04	0.66
0.05600	1.27	7.45	0.17	1.04	0.66
0.05640	1.28	7.48	0.17	1.04	0.66
0.05680	1.28	7.51	0.17	1.04	0.66
0.05720	1.29	7.53	0.17	1.04	0.66
0.05760	1.29	7.56	0.17	1.04	0.66
0.05800	1.30	7.58	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05840	1.30	7.61	0.17	1.04	0.66
0.05880	1.31	7.64	0.17	1.04	0.66
0.05920	1.31	7.66	0.17	1.04	0.66
0.05960	1.32	7.69	0.17	1.04	0.66
0.06000	1.32	7.71	0.17	1.04	0.66
0.06040	1.32	7.74	0.17	1.04	0.66
0.06080	1.33	7.77	0.17	1.04	0.66
0.06120	1.33	7.79	0.17	1.04	0.66
0.06160	1.34	7.82	0.17	1.04	0.66
0.06200	1.34	7.84	0.17	1.04	0.66
0.06240	1.35	7.87	0.17	1.04	0.66
0.06280	1.35	7.89	0.17	1.04	0.66
0.06320	1.35	7.92	0.17	1.04	0.66
0.06360	1.36	7.94	0.17	1.04	0.66
0.06400	1.36	7.97	0.17	1.04	0.66
0.06440	1.37	7.99	0.17	1.04	0.66
0.06480	1.37	8.02	0.17	1.04	0.66
0.06520	1.38	8.04	0.17	1.04	0.66
0.06560	1.38	8.07	0.17	1.04	0.66
0.06600	1.38	8.09	0.17	1.04	0.66
0.06640	1.39	8.12	0.17	1.04	0.66
0.06680	1.39	8.14	0.17	1.04	0.66
0.06720	1.40	8.16	0.17	1.04	0.66
0.06760	1.40	8.19	0.17	1.04	0.66
0.06800	1.40	8.21	0.17	1.04	0.66
0.06840	1.41	8.24	0.17	1.04	0.66
0.06880	1.41	8.26	0.17	1.04	0.66
0.06920	1.42	8.29	0.17	1.04	0.66
0.06960	1.42	8.31	0.17	1.04	0.66
0.07000	1.43	8.33	0.17	1.04	0.66
0.07040	1.43	8.36	0.17	1.04	0.66
0.07080	1.43	8.38	0.17	1.04	0.66
0.07120	1.44	8.40	0.17	1.04	0.66
0.07160	1.44	8.43	0.17	1.04	0.66
0.07200	1.45	8.45	0.17	1.04	0.66
0.07240	1.45	8.48	0.17	1.04	0.66
0.07280	1.45	8.50	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.07320	1.46	8.52	0.17	1.04	0.66
0.07360	1.46	8.55	0.17	1.04	0.66
0.07400	1.47	8.57	0.17	1.04	0.66
0.07440	1.47	8.59	0.17	1.04	0.66
0.07480	1.47	8.61	0.17	1.04	0.66
0.07520	1.48	8.64	0.17	1.04	0.66
0.07560	1.48	8.66	0.17	1.04	0.66
0.07600	1.49	8.68	0.17	1.04	0.66
0.07640	1.49	8.71	0.17	1.04	0.66
0.07680	1.49	8.73	0.17	1.04	0.66
0.07720	1.50	8.75	0.17	1.04	0.66
0.07760	1.50	8.77	0.17	1.04	0.66
0.07800	1.50	8.80	0.17	1.04	0.66
0.07840	1.51	8.82	0.17	1.04	0.66
0.07880	1.51	8.84	0.17	1.04	0.66
0.07920	1.52	8.86	0.17	1.04	0.66
0.07960	1.52	8.89	0.17	1.04	0.66
0.08000	1.52	8.91	0.17	1.04	0.66

Rating Table for 10 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.42	ft
Diameter	0.83	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00320	0.58	2.12	0.27	1.31	0.83
0.00360	0.61	2.25	0.27	1.31	0.83
0.00400	0.65	2.37	0.27	1.31	0.83
0.00440	0.68	2.49	0.27	1.31	0.83
0.00480	0.71	2.60	0.27	1.31	0.83
0.00520	0.74	2.71	0.27	1.31	0.83
0.00560	0.77	2.81	0.27	1.31	0.83
0.00600	0.79	2.91	0.27	1.31	0.83
0.00640	0.82	3.01	0.27	1.31	0.83
0.00680	0.84	3.10	0.27	1.31	0.83
0.00720	0.87	3.19	0.27	1.31	0.83
0.00760	0.89	3.28	0.27	1.31	0.83
0.00800	0.92	3.37	0.27	1.31	0.83
0.00840	0.94	3.45	0.27	1.31	0.83
0.00880	0.96	3.53	0.27	1.31	0.83
0.00920	0.98	3.61	0.27	1.31	0.83
0.00960	1.00	3.69	0.27	1.31	0.83
0.01000	1.02	3.77	0.27	1.31	0.83
0.01040	1.05	3.84	0.27	1.31	0.83
0.01080	1.07	3.91	0.27	1.31	0.83
0.01120	1.08	3.99	0.27	1.31	0.83
0.01160	1.10	4.06	0.27	1.31	0.83
0.01200	1.12	4.13	0.27	1.31	0.83
0.01240	1.14	4.20	0.27	1.31	0.83
0.01280	1.16	4.26	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01320	1.18	4.33	0.27	1.31	0.83
0.01360	1.20	4.40	0.27	1.31	0.83
0.01400	1.21	4.46	0.27	1.31	0.83
0.01440	1.23	4.52	0.27	1.31	0.83
0.01480	1.25	4.59	0.27	1.31	0.83
0.01520	1.26	4.65	0.27	1.31	0.83
0.01560	1.28	4.71	0.27	1.31	0.83
0.01600	1.30	4.77	0.27	1.31	0.83
0.01640	1.31	4.83	0.27	1.31	0.83
0.01680	1.33	4.89	0.27	1.31	0.83
0.01720	1.35	4.94	0.27	1.31	0.83
0.01760	1.36	5.00	0.27	1.31	0.83
0.01800	1.38	5.06	0.27	1.31	0.83
0.01840	1.39	5.11	0.27	1.31	0.83
0.01880	1.41	5.17	0.27	1.31	0.83
0.01920	1.42	5.22	0.27	1.31	0.83
0.01960	1.44	5.28	0.27	1.31	0.83
0.02000	1.45	5.33	0.27	1.31	0.83
0.02040	1.47	5.39	0.27	1.31	0.83
0.02080	1.48	5.44	0.27	1.31	0.83
0.02120	1.49	5.49	0.27	1.31	0.83
0.02160	1.51	5.54	0.27	1.31	0.83
0.02200	1.52	5.59	0.27	1.31	0.83
0.02240	1.54	5.64	0.27	1.31	0.83
0.02280	1.55	5.69	0.27	1.31	0.83
0.02320	1.56	5.74	0.27	1.31	0.83
0.02360	1.58	5.79	0.27	1.31	0.83
0.02400	1.59	5.84	0.27	1.31	0.83
0.02440	1.60	5.89	0.27	1.31	0.83
0.02480	1.62	5.94	0.27	1.31	0.83
0.02520	1.63	5.99	0.27	1.31	0.83
0.02560	1.64	6.03	0.27	1.31	0.83
0.02600	1.65	6.08	0.27	1.31	0.83
0.02640	1.67	6.13	0.27	1.31	0.83
0.02680	1.68	6.17	0.27	1.31	0.83
0.02720	1.69	6.22	0.27	1.31	0.83
0.02760	1.70	6.27	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.02800	1.72	6.31	0.27	1.31	0.83
0.02840	1.73	6.36	0.27	1.31	0.83
0.02880	1.74	6.40	0.27	1.31	0.83
0.02920	1.75	6.45	0.27	1.31	0.83
0.02960	1.77	6.49	0.27	1.31	0.83
0.03000	1.78	6.53	0.27	1.31	0.83
0.03040	1.79	6.58	0.27	1.31	0.83
0.03080	1.80	6.62	0.27	1.31	0.83
0.03120	1.81	6.66	0.27	1.31	0.83
0.03160	1.82	6.71	0.27	1.31	0.83
0.03200	1.84	6.75	0.27	1.31	0.83
0.03240	1.85	6.79	0.27	1.31	0.83
0.03280	1.86	6.83	0.27	1.31	0.83
0.03320	1.87	6.87	0.27	1.31	0.83
0.03360	1.88	6.91	0.27	1.31	0.83
0.03400	1.89	6.96	0.27	1.31	0.83
0.03440	1.90	7.00	0.27	1.31	0.83
0.03480	1.91	7.04	0.27	1.31	0.83
0.03520	1.93	7.08	0.27	1.31	0.83
0.03560	1.94	7.12	0.27	1.31	0.83
0.03600	1.95	7.16	0.27	1.31	0.83
0.03640	1.96	7.20	0.27	1.31	0.83
0.03680	1.97	7.24	0.27	1.31	0.83
0.03720	1.98	7.28	0.27	1.31	0.83
0.03760	1.99	7.32	0.27	1.31	0.83
0.03800	2.00	7.35	0.27	1.31	0.83
0.03840	2.01	7.39	0.27	1.31	0.83
0.03880	2.02	7.43	0.27	1.31	0.83
0.03920	2.03	7.47	0.27	1.31	0.83
0.03960	2.04	7.51	0.27	1.31	0.83
0.04000	2.05	7.55	0.27	1.31	0.83
0.04040	2.06	7.58	0.27	1.31	0.83
0.04080	2.07	7.62	0.27	1.31	0.83
0.04120	2.08	7.66	0.27	1.31	0.83
0.04160	2.09	7.69	0.27	1.31	0.83
0.04200	2.10	7.73	0.27	1.31	0.83
0.04240	2.11	7.77	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04280	2.12	7.80	0.27	1.31	0.83
0.04320	2.13	7.84	0.27	1.31	0.83
0.04360	2.14	7.88	0.27	1.31	0.83
0.04400	2.15	7.91	0.27	1.31	0.83
0.04440	2.16	7.95	0.27	1.31	0.83
0.04480	2.17	7.99	0.27	1.31	0.83
0.04520	2.18	8.02	0.27	1.31	0.83
0.04560	2.19	8.06	0.27	1.31	0.83
0.04600	2.20	8.09	0.27	1.31	0.83
0.04640	2.21	8.13	0.27	1.31	0.83
0.04680	2.22	8.16	0.27	1.31	0.83
0.04720	2.23	8.20	0.27	1.31	0.83
0.04760	2.24	8.23	0.27	1.31	0.83
0.04800	2.25	8.27	0.27	1.31	0.83
0.04840	2.26	8.30	0.27	1.31	0.83
0.04880	2.27	8.33	0.27	1.31	0.83
0.04920	2.28	8.37	0.27	1.31	0.83
0.04960	2.29	8.40	0.27	1.31	0.83
0.05000	2.30	8.44	0.27	1.31	0.83
0.05040	2.30	8.47	0.27	1.31	0.83
0.05080	2.31	8.50	0.27	1.31	0.83
0.05120	2.32	8.54	0.27	1.31	0.83
0.05160	2.33	8.57	0.27	1.31	0.83
0.05200	2.34	8.60	0.27	1.31	0.83
0.05240	2.35	8.64	0.27	1.31	0.83
0.05280	2.36	8.67	0.27	1.31	0.83
0.05320	2.37	8.70	0.27	1.31	0.83
0.05360	2.38	8.74	0.27	1.31	0.83
0.05400	2.39	8.77	0.27	1.31	0.83
0.05440	2.39	8.80	0.27	1.31	0.83
0.05480	2.40	8.83	0.27	1.31	0.83
0.05520	2.41	8.86	0.27	1.31	0.83
0.05560	2.42	8.90	0.27	1.31	0.83
0.05600	2.43	8.93	0.27	1.31	0.83
0.05640	2.44	8.96	0.27	1.31	0.83
0.05680	2.45	8.99	0.27	1.31	0.83
0.05720	2.46	9.02	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.05760	2.46	9.06	0.27	1.31	0.83
0.05800	2.47	9.09	0.27	1.31	0.83
0.05840	2.48	9.12	0.27	1.31	0.83
0.05880	2.49	9.15	0.27	1.31	0.83
0.05920	2.50	9.18	0.27	1.31	0.83
0.05960	2.51	9.21	0.27	1.31	0.83
0.06000	2.51	9.24	0.27	1.31	0.83
0.06040	2.52	9.27	0.27	1.31	0.83
0.06080	2.53	9.30	0.27	1.31	0.83
0.06120	2.54	9.33	0.27	1.31	0.83
0.06160	2.55	9.36	0.27	1.31	0.83
0.06200	2.56	9.40	0.27	1.31	0.83
0.06240	2.56	9.43	0.27	1.31	0.83
0.06280	2.57	9.46	0.27	1.31	0.83
0.06320	2.58	9.49	0.27	1.31	0.83
0.06360	2.59	9.52	0.27	1.31	0.83
0.06400	2.60	9.55	0.27	1.31	0.83
0.06440	2.61	9.58	0.27	1.31	0.83
0.06480	2.61	9.61	0.27	1.31	0.83
0.06520	2.62	9.63	0.27	1.31	0.83
0.06560	2.63	9.66	0.27	1.31	0.83
0.06600	2.64	9.69	0.27	1.31	0.83
0.06640	2.65	9.72	0.27	1.31	0.83
0.06680	2.65	9.75	0.27	1.31	0.83
0.06720	2.66	9.78	0.27	1.31	0.83
0.06760	2.67	9.81	0.27	1.31	0.83
0.06800	2.68	9.84	0.27	1.31	0.83
0.06840	2.69	9.87	0.27	1.31	0.83
0.06880	2.69	9.90	0.27	1.31	0.83
0.06920	2.70	9.93	0.27	1.31	0.83
0.06960	2.71	9.95	0.27	1.31	0.83
0.07000	2.72	9.98	0.27	1.31	0.83
0.07040	2.72	10.01	0.27	1.31	0.83
0.07080	2.73	10.04	0.27	1.31	0.83
0.07120	2.74	10.07	0.27	1.31	0.83
0.07160	2.75	10.10	0.27	1.31	0.83
0.07200	2.75	10.13	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.07240	2.76	10.15	0.27	1.31	0.83
0.07280	2.77	10.18	0.27	1.31	0.83
0.07320	2.78	10.21	0.27	1.31	0.83
0.07360	2.79	10.24	0.27	1.31	0.83
0.07400	2.79	10.26	0.27	1.31	0.83
0.07440	2.80	10.29	0.27	1.31	0.83
0.07480	2.81	10.32	0.27	1.31	0.83
0.07520	2.82	10.35	0.27	1.31	0.83
0.07560	2.82	10.38	0.27	1.31	0.83
0.07600	2.83	10.40	0.27	1.31	0.83
0.07640	2.84	10.43	0.27	1.31	0.83
0.07680	2.85	10.46	0.27	1.31	0.83
0.07720	2.85	10.48	0.27	1.31	0.83
0.07760	2.86	10.51	0.27	1.31	0.83
0.07800	2.87	10.54	0.27	1.31	0.83
0.07840	2.87	10.57	0.27	1.31	0.83
0.07880	2.88	10.59	0.27	1.31	0.83
0.07920	2.89	10.62	0.27	1.31	0.83
0.07960	2.90	10.65	0.27	1.31	0.83
0.08000	2.90	10.67	0.27	1.31	0.83

Rating Table for 12 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.50	ft
Diameter	1.00	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00240	0.83	2.11	0.39	1.57	1.00
0.00280	0.90	2.28	0.39	1.57	1.00
0.00320	0.96	2.44	0.39	1.57	1.00
0.00360	1.02	2.59	0.39	1.57	1.00
0.00400	1.07	2.73	0.39	1.57	1.00
0.00440	1.13	2.87	0.39	1.57	1.00
0.00480	1.18	3.00	0.39	1.57	1.00
0.00520	1.23	3.12	0.39	1.57	1.00
0.00560	1.27	3.24	0.39	1.57	1.00
0.00600	1.32	3.35	0.39	1.57	1.00
0.00640	1.36	3.46	0.39	1.57	1.00
0.00680	1.40	3.57	0.39	1.57	1.00
0.00720	1.44	3.68	0.39	1.57	1.00
0.00760	1.48	3.78	0.39	1.57	1.00
0.00800	1.52	3.88	0.39	1.57	1.00
0.00840	1.56	3.97	0.39	1.57	1.00
0.00880	1.60	4.07	0.39	1.57	1.00
0.00920	1.63	4.16	0.39	1.57	1.00
0.00960	1.67	4.25	0.39	1.57	1.00
0.01000	1.70	4.34	0.39	1.57	1.00
0.01040	1.74	4.42	0.39	1.57	1.00
0.01080	1.77	4.51	0.39	1.57	1.00
0.01120	1.80	4.59	0.39	1.57	1.00
0.01160	1.83	4.67	0.39	1.57	1.00
0.01200	1.87	4.75	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01240	1.90	4.83	0.39	1.57	1.00
0.01280	1.93	4.91	0.39	1.57	1.00
0.01320	1.96	4.98	0.39	1.57	1.00
0.01360	1.99	5.06	0.39	1.57	1.00
0.01400	2.02	5.13	0.39	1.57	1.00
0.01440	2.04	5.21	0.39	1.57	1.00
0.01480	2.07	5.28	0.39	1.57	1.00
0.01520	2.10	5.35	0.39	1.57	1.00
0.01560	2.13	5.42	0.39	1.57	1.00
0.01600	2.16	5.49	0.39	1.57	1.00
0.01640	2.18	5.56	0.39	1.57	1.00
0.01680	2.21	5.62	0.39	1.57	1.00
0.01720	2.23	5.69	0.39	1.57	1.00
0.01760	2.26	5.76	0.39	1.57	1.00
0.01800	2.29	5.82	0.39	1.57	1.00
0.01840	2.31	5.89	0.39	1.57	1.00
0.01880	2.34	5.95	0.39	1.57	1.00
0.01920	2.36	6.01	0.39	1.57	1.00
0.01960	2.39	6.08	0.39	1.57	1.00
0.02000	2.41	6.14	0.39	1.57	1.00
0.02040	2.43	6.20	0.39	1.57	1.00
0.02080	2.46	6.26	0.39	1.57	1.00
0.02120	2.48	6.32	0.39	1.57	1.00
0.02160	2.50	6.38	0.39	1.57	1.00
0.02200	2.53	6.44	0.39	1.57	1.00
0.02240	2.55	6.50	0.39	1.57	1.00
0.02280	2.57	6.55	0.39	1.57	1.00
0.02320	2.60	6.61	0.39	1.57	1.00
0.02360	2.62	6.67	0.39	1.57	1.00
0.02400	2.64	6.72	0.39	1.57	1.00
0.02440	2.66	6.78	0.39	1.57	1.00
0.02480	2.68	6.84	0.39	1.57	1.00
0.02520	2.71	6.89	0.39	1.57	1.00
0.02560	2.73	6.94	0.39	1.57	1.00
0.02600	2.75	7.00	0.39	1.57	1.00
0.02640	2.77	7.05	0.39	1.57	1.00
0.02680	2.79	7.11	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02720	2.81	7.16	0.39	1.57	1.00
0.02760	2.83	7.21	0.39	1.57	1.00
0.02800	2.85	7.26	0.39	1.57	1.00
0.02840	2.87	7.32	0.39	1.57	1.00
0.02880	2.89	7.37	0.39	1.57	1.00
0.02920	2.91	7.42	0.39	1.57	1.00
0.02960	2.93	7.47	0.39	1.57	1.00
0.03000	2.95	7.52	0.39	1.57	1.00
0.03040	2.97	7.57	0.39	1.57	1.00
0.03080	2.99	7.62	0.39	1.57	1.00
0.03120	3.01	7.67	0.39	1.57	1.00
0.03160	3.03	7.72	0.39	1.57	1.00
0.03200	3.05	7.77	0.39	1.57	1.00
0.03240	3.07	7.81	0.39	1.57	1.00
0.03280	3.09	7.86	0.39	1.57	1.00
0.03320	3.11	7.91	0.39	1.57	1.00
0.03360	3.13	7.96	0.39	1.57	1.00
0.03400	3.14	8.01	0.39	1.57	1.00
0.03440	3.16	8.05	0.39	1.57	1.00
0.03480	3.18	8.10	0.39	1.57	1.00
0.03520	3.20	8.15	0.39	1.57	1.00
0.03560	3.22	8.19	0.39	1.57	1.00
0.03600	3.23	8.24	0.39	1.57	1.00
0.03640	3.25	8.28	0.39	1.57	1.00
0.03680	3.27	8.33	0.39	1.57	1.00
0.03720	3.29	8.37	0.39	1.57	1.00
0.03760	3.31	8.42	0.39	1.57	1.00
0.03800	3.32	8.46	0.39	1.57	1.00
0.03840	3.34	8.51	0.39	1.57	1.00
0.03880	3.36	8.55	0.39	1.57	1.00
0.03920	3.38	8.60	0.39	1.57	1.00
0.03960	3.39	8.64	0.39	1.57	1.00
0.04000	3.41	8.68	0.39	1.57	1.00
0.04040	3.43	8.73	0.39	1.57	1.00
0.04080	3.44	8.77	0.39	1.57	1.00
0.04120	3.46	8.81	0.39	1.57	1.00
0.04160	3.48	8.86	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04200	3.49	8.90	0.39	1.57	1.00
0.04240	3.51	8.94	0.39	1.57	1.00
0.04280	3.53	8.98	0.39	1.57	1.00
0.04320	3.54	9.02	0.39	1.57	1.00
0.04360	3.56	9.07	0.39	1.57	1.00
0.04400	3.58	9.11	0.39	1.57	1.00
0.04440	3.59	9.15	0.39	1.57	1.00
0.04480	3.61	9.19	0.39	1.57	1.00
0.04520	3.63	9.23	0.39	1.57	1.00
0.04560	3.64	9.27	0.39	1.57	1.00
0.04600	3.66	9.31	0.39	1.57	1.00
0.04640	3.67	9.35	0.39	1.57	1.00
0.04680	3.69	9.39	0.39	1.57	1.00
0.04720	3.70	9.43	0.39	1.57	1.00
0.04760	3.72	9.47	0.39	1.57	1.00
0.04800	3.74	9.51	0.39	1.57	1.00
0.04840	3.75	9.55	0.39	1.57	1.00
0.04880	3.77	9.59	0.39	1.57	1.00
0.04920	3.78	9.63	0.39	1.57	1.00
0.04960	3.80	9.67	0.39	1.57	1.00
0.05000	3.81	9.71	0.39	1.57	1.00
0.05040	3.83	9.75	0.39	1.57	1.00
0.05080	3.84	9.79	0.39	1.57	1.00
0.05120	3.86	9.83	0.39	1.57	1.00
0.05160	3.87	9.86	0.39	1.57	1.00
0.05200	3.89	9.90	0.39	1.57	1.00
0.05240	3.90	9.94	0.39	1.57	1.00
0.05280	3.92	9.98	0.39	1.57	1.00
0.05320	3.93	10.02	0.39	1.57	1.00
0.05360	3.95	10.05	0.39	1.57	1.00
0.05400	3.96	10.09	0.39	1.57	1.00
0.05440	3.98	10.13	0.39	1.57	1.00
0.05480	3.99	10.17	0.39	1.57	1.00
0.05520	4.01	10.20	0.39	1.57	1.00
0.05560	4.02	10.24	0.39	1.57	1.00
0.05600	4.04	10.28	0.39	1.57	1.00
0.05640	4.05	10.31	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.05680	4.06	10.35	0.39	1.57	1.00
0.05720	4.08	10.39	0.39	1.57	1.00
0.05760	4.09	10.42	0.39	1.57	1.00
0.05800	4.11	10.46	0.39	1.57	1.00
0.05840	4.12	10.49	0.39	1.57	1.00
0.05880	4.14	10.53	0.39	1.57	1.00
0.05920	4.15	10.57	0.39	1.57	1.00
0.05960	4.16	10.60	0.39	1.57	1.00
0.06000	4.18	10.64	0.39	1.57	1.00

Rating Table for 15 VCP

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.63	ft
Diameter	1.25	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00400	1.99	3.24	0.61	1.96	1.25
0.00440	2.08	3.40	0.61	1.96	1.25
0.00480	2.18	3.55	0.61	1.96	1.25
0.00520	2.27	3.69	0.61	1.96	1.25
0.00560	2.35	3.83	0.61	1.96	1.25
0.00600	2.44	3.97	0.61	1.96	1.25
0.00640	2.52	4.10	0.61	1.96	1.25
0.00680	2.59	4.23	0.61	1.96	1.25
0.00720	2.67	4.35	0.61	1.96	1.25
0.00760	2.74	4.47	0.61	1.96	1.25
0.00800	2.81	4.59	0.61	1.96	1.25
0.00840	2.88	4.70	0.61	1.96	1.25
0.00880	2.95	4.81	0.61	1.96	1.25
0.00920	3.02	4.92	0.61	1.96	1.25
0.00960	3.08	5.03	0.61	1.96	1.25
0.01000	3.15	5.13	0.61	1.96	1.25
0.01040	3.21	5.23	0.61	1.96	1.25
0.01080	3.27	5.33	0.61	1.96	1.25
0.01120	3.33	5.43	0.61	1.96	1.25
0.01160	3.39	5.53	0.61	1.96	1.25
0.01200	3.45	5.62	0.61	1.96	1.25
0.01240	3.51	5.71	0.61	1.96	1.25
0.01280	3.56	5.81	0.61	1.96	1.25
0.01320	3.62	5.90	0.61	1.96	1.25
0.01360	3.67	5.98	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01400	3.73	6.07	0.61	1.96	1.25
0.01440	3.78	6.16	0.61	1.96	1.25
0.01480	3.83	6.24	0.61	1.96	1.25
0.01520	3.88	6.33	0.61	1.96	1.25
0.01560	3.93	6.41	0.61	1.96	1.25
0.01600	3.98	6.49	0.61	1.96	1.25
0.01640	4.03	6.57	0.61	1.96	1.25
0.01680	4.08	6.65	0.61	1.96	1.25
0.01720	4.13	6.73	0.61	1.96	1.25
0.01760	4.18	6.81	0.61	1.96	1.25
0.01800	4.23	6.89	0.61	1.96	1.25
0.01840	4.27	6.96	0.61	1.96	1.25
0.01880	4.32	7.04	0.61	1.96	1.25
0.01920	4.36	7.11	0.61	1.96	1.25
0.01960	4.41	7.19	0.61	1.96	1.25
0.02000	4.46	7.26	0.61	1.96	1.25
0.02040	4.50	7.33	0.61	1.96	1.25
0.02080	4.54	7.40	0.61	1.96	1.25
0.02120	4.59	7.48	0.61	1.96	1.25
0.02160	4.63	7.55	0.61	1.96	1.25
0.02200	4.67	7.62	0.61	1.96	1.25
0.02240	4.72	7.68	0.61	1.96	1.25
0.02280	4.76	7.75	0.61	1.96	1.25
0.02320	4.80	7.82	0.61	1.96	1.25
0.02360	4.84	7.89	0.61	1.96	1.25
0.02400	4.88	7.95	0.61	1.96	1.25
0.02440	4.92	8.02	0.61	1.96	1.25
0.02480	4.96	8.09	0.61	1.96	1.25
0.02520	5.00	8.15	0.61	1.96	1.25
0.02560	5.04	8.22	0.61	1.96	1.25
0.02600	5.08	8.28	0.61	1.96	1.25
0.02640	5.12	8.34	0.61	1.96	1.25
0.02680	5.16	8.41	0.61	1.96	1.25
0.02720	5.20	8.47	0.61	1.96	1.25
0.02760	5.23	8.53	0.61	1.96	1.25
0.02800	5.27	8.59	0.61	1.96	1.25
0.02840	5.31	8.65	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.02880	5.35	8.72	0.61	1.96	1.25
0.02920	5.38	8.78	0.61	1.96	1.25
0.02960	5.42	8.84	0.61	1.96	1.25
0.03000	5.46	8.90	0.61	1.96	1.25
0.03040	5.49	8.95	0.61	1.96	1.25
0.03080	5.53	9.01	0.61	1.96	1.25
0.03120	5.57	9.07	0.61	1.96	1.25
0.03160	5.60	9.13	0.61	1.96	1.25
0.03200	5.64	9.19	0.61	1.96	1.25
0.03240	5.67	9.24	0.61	1.96	1.25
0.03280	5.71	9.30	0.61	1.96	1.25
0.03320	5.74	9.36	0.61	1.96	1.25
0.03360	5.78	9.41	0.61	1.96	1.25
0.03400	5.81	9.47	0.61	1.96	1.25
0.03440	5.85	9.53	0.61	1.96	1.25
0.03480	5.88	9.58	0.61	1.96	1.25
0.03520	5.91	9.64	0.61	1.96	1.25
0.03560	5.95	9.69	0.61	1.96	1.25
0.03600	5.98	9.75	0.61	1.96	1.25
0.03640	6.01	9.80	0.61	1.96	1.25
0.03680	6.05	9.85	0.61	1.96	1.25
0.03720	6.08	9.91	0.61	1.96	1.25
0.03760	6.11	9.96	0.61	1.96	1.25
0.03800	6.14	10.01	0.61	1.96	1.25
0.03840	6.18	10.07	0.61	1.96	1.25
0.03880	6.21	10.12	0.61	1.96	1.25
0.03920	6.24	10.17	0.61	1.96	1.25
0.03960	6.27	10.22	0.61	1.96	1.25
0.04000	6.30	10.27	0.61	1.96	1.25
0.04040	6.33	10.32	0.61	1.96	1.25
0.04080	6.37	10.38	0.61	1.96	1.25
0.04120	6.40	10.43	0.61	1.96	1.25
0.04160	6.43	10.48	0.61	1.96	1.25
0.04200	6.46	10.53	0.61	1.96	1.25
0.04240	6.49	10.58	0.61	1.96	1.25
0.04280	6.52	10.63	0.61	1.96	1.25
0.04320	6.55	10.68	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.04360	6.58	10.73	0.61	1.96	1.25
0.04400	6.61	10.77	0.61	1.96	1.25
0.04440	6.64	10.82	0.61	1.96	1.25
0.04480	6.67	10.87	0.61	1.96	1.25
0.04520	6.70	10.92	0.61	1.96	1.25
0.04560	6.73	10.97	0.61	1.96	1.25
0.04600	6.76	11.02	0.61	1.96	1.25
0.04640	6.79	11.06	0.61	1.96	1.25
0.04680	6.82	11.11	0.61	1.96	1.25
0.04720	6.85	11.16	0.61	1.96	1.25
0.04760	6.88	11.21	0.61	1.96	1.25
0.04800	6.91	11.25	0.61	1.96	1.25
0.04840	6.93	11.30	0.61	1.96	1.25
0.04880	6.96	11.35	0.61	1.96	1.25
0.04920	6.99	11.39	0.61	1.96	1.25
0.04960	7.02	11.44	0.61	1.96	1.25
0.05000	7.05	11.49	0.61	1.96	1.25
0.05040	7.08	11.53	0.61	1.96	1.25
0.05080	7.10	11.58	0.61	1.96	1.25
0.05120	7.13	11.62	0.61	1.96	1.25
0.05160	7.16	11.67	0.61	1.96	1.25
0.05200	7.19	11.71	0.61	1.96	1.25
0.05240	7.22	11.76	0.61	1.96	1.25
0.05280	7.24	11.80	0.61	1.96	1.25
0.05320	7.27	11.85	0.61	1.96	1.25
0.05360	7.30	11.89	0.61	1.96	1.25
0.05400	7.32	11.94	0.61	1.96	1.25
0.05440	7.35	11.98	0.61	1.96	1.25
0.05480	7.38	12.03	0.61	1.96	1.25
0.05520	7.41	12.07	0.61	1.96	1.25
0.05560	7.43	12.11	0.61	1.96	1.25
0.05600	7.46	12.16	0.61	1.96	1.25
0.05640	7.49	12.20	0.61	1.96	1.25
0.05680	7.51	12.24	0.61	1.96	1.25
0.05720	7.54	12.29	0.61	1.96	1.25
0.05760	7.56	12.33	0.61	1.96	1.25
0.05800	7.59	12.37	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05840	7.62	12.41	0.61	1.96	1.25
0.05880	7.64	12.46	0.61	1.96	1.25
0.05920	7.67	12.50	0.61	1.96	1.25
0.05960	7.70	12.54	0.61	1.96	1.25
0.06000	7.72	12.58	0.61	1.96	1.25
0.06040	7.75	12.63	0.61	1.96	1.25
0.06080	7.77	12.67	0.61	1.96	1.25
0.06120	7.80	12.71	0.61	1.96	1.25
0.06160	7.82	12.75	0.61	1.96	1.25
0.06200	7.85	12.79	0.61	1.96	1.25
0.06240	7.87	12.83	0.61	1.96	1.25
0.06280	7.90	12.87	0.61	1.96	1.25
0.06320	7.92	12.91	0.61	1.96	1.25
0.06360	7.95	12.96	0.61	1.96	1.25
0.06400	7.97	13.00	0.61	1.96	1.25
0.06440	8.00	13.04	0.61	1.96	1.25
0.06480	8.02	13.08	0.61	1.96	1.25
0.06520	8.05	13.12	0.61	1.96	1.25
0.06560	8.07	13.16	0.61	1.96	1.25
0.06600	8.10	13.20	0.61	1.96	1.25
0.06640	8.12	13.24	0.61	1.96	1.25
0.06680	8.15	13.28	0.61	1.96	1.25
0.06720	8.17	13.32	0.61	1.96	1.25
0.06760	8.20	13.36	0.61	1.96	1.25
0.06800	8.22	13.40	0.61	1.96	1.25
0.06840	8.24	13.44	0.61	1.96	1.25
0.06880	8.27	13.48	0.61	1.96	1.25
0.06920	8.29	13.51	0.61	1.96	1.25
0.06960	8.32	13.55	0.61	1.96	1.25
0.07000	8.34	13.59	0.61	1.96	1.25
0.07040	8.36	13.63	0.61	1.96	1.25
0.07080	8.39	13.67	0.61	1.96	1.25
0.07120	8.41	13.71	0.61	1.96	1.25
0.07160	8.43	13.75	0.61	1.96	1.25
0.07200	8.46	13.79	0.61	1.96	1.25
0.07240	8.48	13.82	0.61	1.96	1.25
0.07280	8.51	13.86	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.07320	8.53	13.90	0.61	1.96	1.25
0.07360	8.55	13.94	0.61	1.96	1.25
0.07400	8.58	13.98	0.61	1.96	1.25
0.07440	8.60	14.01	0.61	1.96	1.25
0.07480	8.62	14.05	0.61	1.96	1.25
0.07520	8.64	14.09	0.61	1.96	1.25
0.07560	8.67	14.13	0.61	1.96	1.25
0.07600	8.69	14.16	0.61	1.96	1.25
0.07640	8.71	14.20	0.61	1.96	1.25
0.07680	8.74	14.24	0.61	1.96	1.25
0.07720	8.76	14.27	0.61	1.96	1.25
0.07760	8.78	14.31	0.61	1.96	1.25
0.07800	8.80	14.35	0.61	1.96	1.25
0.07840	8.83	14.39	0.61	1.96	1.25
0.07880	8.85	14.42	0.61	1.96	1.25
0.07920	8.87	14.46	0.61	1.96	1.25
0.07960	8.89	14.49	0.61	1.96	1.25
0.08000	8.92	14.53	0.61	1.96	1.25

Rating Table for 15 inch - 3/4 Full

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.0040 ft/ft
Normal Depth	11.25 in
Diameter	15.0 in

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0008	1.62	1.64	1.0	2.6	1.08
0.0012	1.99	2.02	1.0	2.6	1.08
0.0016	2.31	2.34	1.0	2.6	1.08
0.0020	2.59	2.62	1.0	2.6	1.08
0.0024	2.84	2.87	1.0	2.6	1.08
0.0028	3.07	3.11	1.0	2.6	1.08
0.0032	3.28	3.32	1.0	2.6	1.08
0.0036	3.48	3.53	1.0	2.6	1.08
0.0040	3.67	3.72	1.0	2.6	1.08
0.0044	3.85	3.90	1.0	2.6	1.08
0.0048	4.03	4.08	1.0	2.6	1.08
0.0052	4.19	4.25	1.0	2.6	1.08
0.0056	4.35	4.41	1.0	2.6	1.08
0.0060	4.50	4.56	1.0	2.6	1.08
0.0064	4.65	4.71	1.0	2.6	1.08
0.0068	4.80	4.86	1.0	2.6	1.08
0.0072	4.94	5.00	1.0	2.6	1.08
0.0076	5.07	5.14	1.0	2.6	1.08
0.0080	5.20	5.27	1.0	2.6	1.08
0.0084	5.33	5.40	1.0	2.6	1.08
0.0088	5.46	5.53	1.0	2.6	1.08
0.0092	5.58	5.65	1.0	2.6	1.08
0.0096	5.70	5.78	1.0	2.6	1.08
0.0100	5.82	5.90	1.0	2.6	1.08
0.0104	5.94	6.01	1.0	2.6	1.08
0.0108	6.05	6.13	1.0	2.6	1.08
0.0112	6.16	6.24	1.0	2.6	1.08
0.0116	6.27	6.35	1.0	2.6	1.08
0.0120	6.38	6.46	1.0	2.6	1.08
0.0124	6.48	6.57	1.0	2.6	1.08
0.0128	6.59	6.67	1.0	2.6	1.08
0.0132	6.69	6.78	1.0	2.6	1.08
0.0136	6.79	6.88	1.0	2.6	1.08
0.0140	6.89	6.98	1.0	2.6	1.08
0.0144	6.99	7.08	1.0	2.6	1.08
0.0148	7.09	7.18	1.0	2.6	1.08
0.0152	7.18	7.27	1.0	2.6	1.08
0.0156	7.27	7.37	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0160	7.37	7.46	1.0	2.6	1.08
0.0164	7.46	7.56	1.0	2.6	1.08
0.0168	7.55	7.65	1.0	2.6	1.08
0.0172	7.64	7.74	1.0	2.6	1.08
0.0176	7.73	7.83	1.0	2.6	1.08
0.0180	7.82	7.92	1.0	2.6	1.08
0.0184	7.90	8.00	1.0	2.6	1.08
0.0188	7.99	8.09	1.0	2.6	1.08
0.0192	8.07	8.18	1.0	2.6	1.08
0.0196	8.16	8.26	1.0	2.6	1.08
0.0200	8.24	8.34	1.0	2.6	1.08
0.0204	8.32	8.43	1.0	2.6	1.08
0.0208	8.40	8.51	1.0	2.6	1.08
0.0212	8.48	8.59	1.0	2.6	1.08
0.0216	8.56	8.67	1.0	2.6	1.08
0.0220	8.64	8.75	1.0	2.6	1.08
0.0224	8.72	8.83	1.0	2.6	1.08
0.0228	8.80	8.91	1.0	2.6	1.08
0.0232	8.87	8.99	1.0	2.6	1.08
0.0236	8.95	9.07	1.0	2.6	1.08
0.0240	9.03	9.14	1.0	2.6	1.08
0.0244	9.10	9.22	1.0	2.6	1.08
0.0248	9.18	9.29	1.0	2.6	1.08
0.0252	9.25	9.37	1.0	2.6	1.08
0.0256	9.32	9.44	1.0	2.6	1.08
0.0260	9.40	9.52	1.0	2.6	1.08
0.0264	9.47	9.59	1.0	2.6	1.08
0.0268	9.54	9.66	1.0	2.6	1.08
0.0272	9.61	9.73	1.0	2.6	1.08
0.0276	9.68	9.81	1.0	2.6	1.08
0.0280	9.75	9.88	1.0	2.6	1.08
0.0284	9.82	9.95	1.0	2.6	1.08
0.0288	9.89	10.02	1.0	2.6	1.08
0.0292	9.96	10.09	1.0	2.6	1.08
0.0296	10.03	10.15	1.0	2.6	1.08
0.0300	10.09	10.22	1.0	2.6	1.08
0.0304	10.16	10.29	1.0	2.6	1.08
0.0308	10.23	10.36	1.0	2.6	1.08
0.0312	10.29	10.43	1.0	2.6	1.08
0.0316	10.36	10.49	1.0	2.6	1.08
0.0320	10.42	10.56	1.0	2.6	1.08
0.0324	10.49	10.62	1.0	2.6	1.08
0.0328	10.55	10.69	1.0	2.6	1.08
0.0332	10.62	10.76	1.0	2.6	1.08
0.0336	10.68	10.82	1.0	2.6	1.08
0.0340	10.75	10.88	1.0	2.6	1.08
0.0344	10.81	10.95	1.0	2.6	1.08
0.0348	10.87	11.01	1.0	2.6	1.08
0.0352	10.93	11.07	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0356	11.00	11.14	1.0	2.6	1.08
0.0360	11.06	11.20	1.0	2.6	1.08
0.0364	11.12	11.26	1.0	2.6	1.08
0.0368	11.18	11.32	1.0	2.6	1.08
0.0372	11.24	11.39	1.0	2.6	1.08
0.0376	11.30	11.45	1.0	2.6	1.08
0.0380	11.36	11.51	1.0	2.6	1.08
0.0384	11.42	11.57	1.0	2.6	1.08
0.0388	11.48	11.63	1.0	2.6	1.08
0.0392	11.54	11.69	1.0	2.6	1.08
0.0396	11.60	11.75	1.0	2.6	1.08
0.0400	11.66	11.81	1.0	2.6	1.08
0.0404	11.71	11.87	1.0	2.6	1.08
0.0408	11.77	11.92	1.0	2.6	1.08
0.0412	11.83	11.98	1.0	2.6	1.08
0.0416	11.89	12.04	1.0	2.6	1.08
0.0420	11.94	12.10	1.0	2.6	1.08
0.0424	12.00	12.16	1.0	2.6	1.08
0.0428	12.06	12.21	1.0	2.6	1.08
0.0432	12.11	12.27	1.0	2.6	1.08
0.0436	12.17	12.33	1.0	2.6	1.08
0.0440	12.23	12.38	1.0	2.6	1.08
0.0444	12.28	12.44	1.0	2.6	1.08
0.0448	12.34	12.50	1.0	2.6	1.08
0.0452	12.39	12.55	1.0	2.6	1.08
0.0456	12.45	12.61	1.0	2.6	1.08
0.0460	12.50	12.66	1.0	2.6	1.08
0.0464	12.55	12.72	1.0	2.6	1.08
0.0468	12.61	12.77	1.0	2.6	1.08
0.0472	12.66	12.83	1.0	2.6	1.08
0.0476	12.72	12.88	1.0	2.6	1.08
0.0480	12.77	12.93	1.0	2.6	1.08
0.0484	12.82	12.99	1.0	2.6	1.08
0.0488	12.88	13.04	1.0	2.6	1.08
0.0492	12.93	13.09	1.0	2.6	1.08
0.0496	12.98	13.15	1.0	2.6	1.08
0.0500	13.03	13.20	1.0	2.6	1.08
0.0504	13.08	13.25	1.0	2.6	1.08
0.0508	13.14	13.31	1.0	2.6	1.08
0.0512	13.19	13.36	1.0	2.6	1.08
0.0516	13.24	13.41	1.0	2.6	1.08
0.0520	13.29	13.46	1.0	2.6	1.08
0.0524	13.34	13.51	1.0	2.6	1.08
0.0528	13.39	13.57	1.0	2.6	1.08
0.0532	13.44	13.62	1.0	2.6	1.08
0.0536	13.49	13.67	1.0	2.6	1.08
0.0540	13.54	13.72	1.0	2.6	1.08
0.0544	13.59	13.77	1.0	2.6	1.08
0.0548	13.64	13.82	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0552	13.69	13.87	1.0	2.6	1.08
0.0556	13.74	13.92	1.0	2.6	1.08
0.0560	13.79	13.97	1.0	2.6	1.08
0.0564	13.84	14.02	1.0	2.6	1.08
0.0568	13.89	14.07	1.0	2.6	1.08
0.0572	13.94	14.12	1.0	2.6	1.08
0.0576	13.99	14.17	1.0	2.6	1.08
0.0580	14.04	14.22	1.0	2.6	1.08
0.0584	14.09	14.27	1.0	2.6	1.08
0.0588	14.13	14.32	1.0	2.6	1.08
0.0592	14.18	14.36	1.0	2.6	1.08
0.0596	14.23	14.41	1.0	2.6	1.08
0.0600	14.28	14.46	1.0	2.6	1.08
0.0604	14.33	14.51	1.0	2.6	1.08
0.0608	14.37	14.56	1.0	2.6	1.08
0.0612	14.42	14.61	1.0	2.6	1.08
0.0616	14.47	14.65	1.0	2.6	1.08
0.0620	14.51	14.70	1.0	2.6	1.08
0.0624	14.56	14.75	1.0	2.6	1.08
0.0628	14.61	14.80	1.0	2.6	1.08
0.0632	14.65	14.84	1.0	2.6	1.08
0.0636	14.70	14.89	1.0	2.6	1.08
0.0640	14.75	14.94	1.0	2.6	1.08
0.0644	14.79	14.98	1.0	2.6	1.08
0.0648	14.84	15.03	1.0	2.6	1.08
0.0652	14.88	15.08	1.0	2.6	1.08
0.0656	14.93	15.12	1.0	2.6	1.08
0.0660	14.97	15.17	1.0	2.6	1.08
0.0664	15.02	15.21	1.0	2.6	1.08
0.0668	15.07	15.26	1.0	2.6	1.08
0.0672	15.11	15.31	1.0	2.6	1.08
0.0676	15.16	15.35	1.0	2.6	1.08
0.0680	15.20	15.40	1.0	2.6	1.08
0.0684	15.24	15.44	1.0	2.6	1.08
0.0688	15.29	15.49	1.0	2.6	1.08
0.0692	15.33	15.53	1.0	2.6	1.08
0.0696	15.38	15.58	1.0	2.6	1.08
0.0700	15.42	15.62	1.0	2.6	1.08
0.0704	15.47	15.67	1.0	2.6	1.08
0.0708	15.51	15.71	1.0	2.6	1.08
0.0712	15.55	15.75	1.0	2.6	1.08
0.0716	15.60	15.80	1.0	2.6	1.08
0.0720	15.64	15.84	1.0	2.6	1.08
0.0724	15.68	15.89	1.0	2.6	1.08
0.0728	15.73	15.93	1.0	2.6	1.08
0.0732	15.77	15.97	1.0	2.6	1.08
0.0736	15.81	16.02	1.0	2.6	1.08
0.0740	15.86	16.06	1.0	2.6	1.08
0.0744	15.90	16.10	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0748	15.94	16.15	1.0	2.6	1.08
0.0752	15.98	16.19	1.0	2.6	1.08
0.0756	16.03	16.23	1.0	2.6	1.08
0.0760	16.07	16.28	1.0	2.6	1.08
0.0764	16.11	16.32	1.0	2.6	1.08
0.0768	16.15	16.36	1.0	2.6	1.08
0.0772	16.20	16.41	1.0	2.6	1.08
0.0776	16.24	16.45	1.0	2.6	1.08
0.0780	16.28	16.49	1.0	2.6	1.08
0.0784	16.32	16.53	1.0	2.6	1.08
0.0788	16.36	16.57	1.0	2.6	1.08
0.0792	16.40	16.62	1.0	2.6	1.08
0.0796	16.45	16.66	1.0	2.6	1.08
0.0800	16.49	16.70	1.0	2.6	1.08

Rating Table for 18 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Normal Depth	0.75	ft
Diameter	1.50	ft

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.00140	1.92	2.18	0.88	2.36	1.50
0.00180	2.19	2.47	0.88	2.36	1.50
0.00220	2.42	2.74	0.88	2.36	1.50
0.00260	2.63	2.98	0.88	2.36	1.50
0.00300	2.83	3.20	0.88	2.36	1.50
0.00340	3.02	3.41	0.88	2.36	1.50
0.00380	3.19	3.61	0.88	2.36	1.50
0.00420	3.35	3.80	0.88	2.36	1.50
0.00460	3.51	3.97	0.88	2.36	1.50
0.00500	3.66	4.15	0.88	2.36	1.50
0.00540	3.81	4.31	0.88	2.36	1.50
0.00580	3.95	4.47	0.88	2.36	1.50
0.00620	4.08	4.62	0.88	2.36	1.50
0.00660	4.21	4.77	0.88	2.36	1.50
0.00700	4.34	4.91	0.88	2.36	1.50
0.00740	4.46	5.05	0.88	2.36	1.50
0.00780	4.58	5.18	0.88	2.36	1.50
0.00820	4.70	5.32	0.88	2.36	1.50
0.00860	4.81	5.44	0.88	2.36	1.50
0.00900	4.92	5.57	0.88	2.36	1.50
0.00940	5.03	5.69	0.88	2.36	1.50
0.00980	5.14	5.81	0.88	2.36	1.50
0.01020	5.24	5.93	0.88	2.36	1.50
0.01060	5.34	6.05	0.88	2.36	1.50
0.01100	5.44	6.16	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01140	5.54	6.27	0.88	2.36	1.50
0.01180	5.64	6.38	0.88	2.36	1.50
0.01220	5.73	6.49	0.88	2.36	1.50
0.01260	5.83	6.59	0.88	2.36	1.50
0.01300	5.92	6.70	0.88	2.36	1.50
0.01340	6.01	6.80	0.88	2.36	1.50
0.01380	6.10	6.90	0.88	2.36	1.50
0.01420	6.19	7.00	0.88	2.36	1.50
0.01460	6.27	7.10	0.88	2.36	1.50
0.01500	6.36	7.20	0.88	2.36	1.50
0.01540	6.44	7.29	0.88	2.36	1.50
0.01580	6.53	7.39	0.88	2.36	1.50
0.01620	6.61	7.48	0.88	2.36	1.50
0.01660	6.69	7.57	0.88	2.36	1.50
0.01700	6.77	7.66	0.88	2.36	1.50
0.01740	6.85	7.75	0.88	2.36	1.50
0.01780	6.93	7.84	0.88	2.36	1.50
0.01820	7.00	7.93	0.88	2.36	1.50
0.01860	7.08	8.01	0.88	2.36	1.50
0.01900	7.16	8.10	0.88	2.36	1.50
0.01940	7.23	8.18	0.88	2.36	1.50
0.01980	7.31	8.27	0.88	2.36	1.50
0.02020	7.38	8.35	0.88	2.36	1.50
0.02060	7.45	8.43	0.88	2.36	1.50
0.02100	7.52	8.52	0.88	2.36	1.50
0.02140	7.60	8.60	0.88	2.36	1.50
0.02180	7.67	8.68	0.88	2.36	1.50
0.02220	7.74	8.76	0.88	2.36	1.50
0.02260	7.81	8.84	0.88	2.36	1.50
0.02300	7.88	8.91	0.88	2.36	1.50
0.02340	7.94	8.99	0.88	2.36	1.50
0.02380	8.01	9.07	0.88	2.36	1.50
0.02420	8.08	9.14	0.88	2.36	1.50
0.02460	8.15	9.22	0.88	2.36	1.50
0.02500	8.21	9.29	0.88	2.36	1.50
0.02540	8.28	9.37	0.88	2.36	1.50
0.02580	8.34	9.44	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02620	8.41	9.51	0.88	2.36	1.50
0.02660	8.47	9.59	0.88	2.36	1.50
0.02700	8.53	9.66	0.88	2.36	1.50
0.02740	8.60	9.73	0.88	2.36	1.50
0.02780	8.66	9.80	0.88	2.36	1.50
0.02820	8.72	9.87	0.88	2.36	1.50
0.02860	8.78	9.94	0.88	2.36	1.50
0.02900	8.84	10.01	0.88	2.36	1.50
0.02940	8.91	10.08	0.88	2.36	1.50
0.02980	8.97	10.15	0.88	2.36	1.50
0.03020	9.03	10.22	0.88	2.36	1.50
0.03060	9.09	10.28	0.88	2.36	1.50
0.03100	9.14	10.35	0.88	2.36	1.50
0.03140	9.20	10.42	0.88	2.36	1.50
0.03180	9.26	10.48	0.88	2.36	1.50
0.03220	9.32	10.55	0.88	2.36	1.50
0.03260	9.38	10.61	0.88	2.36	1.50
0.03300	9.44	10.68	0.88	2.36	1.50
0.03340	9.49	10.74	0.88	2.36	1.50
0.03380	9.55	10.81	0.88	2.36	1.50
0.03420	9.61	10.87	0.88	2.36	1.50
0.03460	9.66	10.93	0.88	2.36	1.50
0.03500	9.72	11.00	0.88	2.36	1.50
0.03540	9.77	11.06	0.88	2.36	1.50
0.03580	9.83	11.12	0.88	2.36	1.50
0.03620	9.88	11.18	0.88	2.36	1.50
0.03660	9.94	11.25	0.88	2.36	1.50
0.03700	9.99	11.31	0.88	2.36	1.50
0.03740	10.05	11.37	0.88	2.36	1.50
0.03780	10.10	11.43	0.88	2.36	1.50
0.03820	10.15	11.49	0.88	2.36	1.50
0.03860	10.21	11.55	0.88	2.36	1.50
0.03900	10.26	11.61	0.88	2.36	1.50
0.03940	10.31	11.67	0.88	2.36	1.50
0.03980	10.36	11.73	0.88	2.36	1.50
0.04020	10.41	11.79	0.88	2.36	1.50
0.04060	10.47	11.85	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04100	10.52	11.90	0.88	2.36	1.50
0.04140	10.57	11.96	0.88	2.36	1.50
0.04180	10.62	12.02	0.88	2.36	1.50
0.04220	10.67	12.08	0.88	2.36	1.50
0.04260	10.72	12.13	0.88	2.36	1.50
0.04300	10.77	12.19	0.88	2.36	1.50
0.04340	10.82	12.25	0.88	2.36	1.50
0.04380	10.87	12.30	0.88	2.36	1.50
0.04420	10.92	12.36	0.88	2.36	1.50
0.04460	10.97	12.42	0.88	2.36	1.50
0.04500	11.02	12.47	0.88	2.36	1.50
0.04540	11.07	12.53	0.88	2.36	1.50
0.04580	11.12	12.58	0.88	2.36	1.50
0.04620	11.17	12.64	0.88	2.36	1.50
0.04660	11.21	12.69	0.88	2.36	1.50
0.04700	11.26	12.75	0.88	2.36	1.50
0.04740	11.31	12.80	0.88	2.36	1.50
0.04780	11.36	12.85	0.88	2.36	1.50
0.04820	11.40	12.91	0.88	2.36	1.50
0.04860	11.45	12.96	0.88	2.36	1.50
0.04900	11.50	13.01	0.88	2.36	1.50
0.04940	11.55	13.07	0.88	2.36	1.50
0.04980	11.59	13.12	0.88	2.36	1.50
0.05020	11.64	13.17	0.88	2.36	1.50
0.05060	11.69	13.23	0.88	2.36	1.50
0.05100	11.73	13.28	0.88	2.36	1.50
0.05140	11.78	13.33	0.88	2.36	1.50
0.05180	11.82	13.38	0.88	2.36	1.50
0.05220	11.87	13.43	0.88	2.36	1.50
0.05260	11.91	13.48	0.88	2.36	1.50
0.05300	11.96	13.54	0.88	2.36	1.50
0.05340	12.00	13.59	0.88	2.36	1.50
0.05380	12.05	13.64	0.88	2.36	1.50
0.05420	12.09	13.69	0.88	2.36	1.50
0.05460	12.14	13.74	0.88	2.36	1.50
0.05500	12.18	13.79	0.88	2.36	1.50
0.05540	12.23	13.84	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05580	12.27	13.89	0.88	2.36	1.50
0.05620	12.32	13.94	0.88	2.36	1.50
0.05660	12.36	13.99	0.88	2.36	1.50
0.05700	12.40	14.04	0.88	2.36	1.50
0.05740	12.45	14.09	0.88	2.36	1.50
0.05780	12.49	14.14	0.88	2.36	1.50
0.05820	12.53	14.18	0.88	2.36	1.50
0.05860	12.58	14.23	0.88	2.36	1.50
0.05900	12.62	14.28	0.88	2.36	1.50
0.05940	12.66	14.33	0.88	2.36	1.50
0.05980	12.70	14.38	0.88	2.36	1.50

Rating Table for 21 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.88	ft
Diameter	1.75	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00400	4.99	4.15	1.20	2.75	1.75
0.00440	5.23	4.35	1.20	2.75	1.75
0.00480	5.47	4.55	1.20	2.75	1.75
0.00520	5.69	4.73	1.20	2.75	1.75
0.00560	5.91	4.91	1.20	2.75	1.75
0.00600	6.12	5.09	1.20	2.75	1.75
0.00640	6.32	5.25	1.20	2.75	1.75
0.00680	6.51	5.42	1.20	2.75	1.75
0.00720	6.70	5.57	1.20	2.75	1.75
0.00760	6.89	5.73	1.20	2.75	1.75
0.00800	7.07	5.88	1.20	2.75	1.75
0.00840	7.24	6.02	1.20	2.75	1.75
0.00880	7.41	6.16	1.20	2.75	1.75
0.00920	7.58	6.30	1.20	2.75	1.75
0.00960	7.74	6.44	1.20	2.75	1.75
0.01000	7.90	6.57	1.20	2.75	1.75
0.01040	8.06	6.70	1.20	2.75	1.75
0.01080	8.21	6.83	1.20	2.75	1.75
0.01120	8.37	6.96	1.20	2.75	1.75
0.01160	8.51	7.08	1.20	2.75	1.75
0.01200	8.66	7.20	1.20	2.75	1.75
0.01240	8.80	7.32	1.20	2.75	1.75
0.01280	8.94	7.44	1.20	2.75	1.75
0.01320	9.08	7.55	1.20	2.75	1.75
0.01360	9.22	7.67	1.20	2.75	1.75

Rating Table for 21 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01400	9.36	7.78	1.20	2.75	1.75
0.01440	9.49	7.89	1.20	2.75	1.75
0.01480	9.62	8.00	1.20	2.75	1.75
0.01520	9.75	8.11	1.20	2.75	1.75
0.01560	9.88	8.21	1.20	2.75	1.75
0.01600	10.00	8.32	1.20	2.75	1.75
0.01640	10.13	8.42	1.20	2.75	1.75
0.01680	10.25	8.52	1.20	2.75	1.75
0.01720	10.37	8.62	1.20	2.75	1.75
0.01760	10.49	8.72	1.20	2.75	1.75
0.01800	10.61	8.82	1.20	2.75	1.75
0.01840	10.73	8.92	1.20	2.75	1.75
0.01880	10.84	9.02	1.20	2.75	1.75
0.01920	10.96	9.11	1.20	2.75	1.75
0.01960	11.07	9.21	1.20	2.75	1.75
0.02000	11.19	9.30	1.20	2.75	1.75
0.02040	11.30	9.39	1.20	2.75	1.75
0.02080	11.41	9.49	1.20	2.75	1.75
0.02120	11.52	9.58	1.20	2.75	1.75
0.02160	11.63	9.67	1.20	2.75	1.75
0.02200	11.73	9.76	1.20	2.75	1.75
0.02240	11.84	9.84	1.20	2.75	1.75
0.02280	11.94	9.93	1.20	2.75	1.75
0.02320	12.05	10.02	1.20	2.75	1.75
0.02360	12.15	10.10	1.20	2.75	1.75
0.02400	12.25	10.19	1.20	2.75	1.75
0.02440	12.36	10.27	1.20	2.75	1.75
0.02480	12.46	10.36	1.20	2.75	1.75
0.02520	12.56	10.44	1.20	2.75	1.75
0.02560	12.66	10.52	1.20	2.75	1.75
0.02600	12.76	10.61	1.20	2.75	1.75
0.02640	12.85	10.69	1.20	2.75	1.75
0.02680	12.95	10.77	1.20	2.75	1.75
0.02720	13.05	10.85	1.20	2.75	1.75
0.02760	13.14	10.93	1.20	2.75	1.75
0.02800	13.24	11.01	1.20	2.75	1.75
0.02840	13.33	11.09	1.20	2.75	1.75

Rating Table for 21 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.02880	13.43	11.16	1.20	2.75	1.75
0.02920	13.52	11.24	1.20	2.75	1.75
0.02960	13.61	11.32	1.20	2.75	1.75
0.03000	13.70	11.39	1.20	2.75	1.75
0.03040	13.79	11.47	1.20	2.75	1.75
0.03080	13.88	11.55	1.20	2.75	1.75
0.03120	13.97	11.62	1.20	2.75	1.75
0.03160	14.06	11.69	1.20	2.75	1.75
0.03200	14.15	11.77	1.20	2.75	1.75
0.03240	14.24	11.84	1.20	2.75	1.75
0.03280	14.33	11.91	1.20	2.75	1.75
0.03320	14.42	11.99	1.20	2.75	1.75
0.03360	14.50	12.06	1.20	2.75	1.75
0.03400	14.59	12.13	1.20	2.75	1.75
0.03440	14.67	12.20	1.20	2.75	1.75
0.03480	14.76	12.27	1.20	2.75	1.75
0.03520	14.84	12.34	1.20	2.75	1.75
0.03560	14.93	12.41	1.20	2.75	1.75
0.03600	15.01	12.48	1.20	2.75	1.75
0.03640	15.10	12.55	1.20	2.75	1.75
0.03680	15.18	12.62	1.20	2.75	1.75
0.03720	15.26	12.69	1.20	2.75	1.75
0.03760	15.34	12.76	1.20	2.75	1.75
0.03800	15.42	12.82	1.20	2.75	1.75
0.03840	15.50	12.89	1.20	2.75	1.75
0.03880	15.59	12.96	1.20	2.75	1.75
0.03920	15.67	13.03	1.20	2.75	1.75
0.03960	15.75	13.09	1.20	2.75	1.75
0.04000	15.82	13.16	1.20	2.75	1.75
0.04040	15.90	13.22	1.20	2.75	1.75
0.04080	15.98	13.29	1.20	2.75	1.75
0.04120	16.06	13.35	1.20	2.75	1.75
0.04160	16.14	13.42	1.20	2.75	1.75
0.04200	16.22	13.48	1.20	2.75	1.75
0.04240	16.29	13.55	1.20	2.75	1.75
0.04280	16.37	13.61	1.20	2.75	1.75
0.04320	16.45	13.67	1.20	2.75	1.75

Rating Table for 21 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.04360	16.52	13.74	1.20	2.75	1.75
0.04400	16.60	13.80	1.20	2.75	1.75
0.04440	16.67	13.86	1.20	2.75	1.75
0.04480	16.75	13.93	1.20	2.75	1.75
0.04520	16.82	13.99	1.20	2.75	1.75
0.04560	16.90	14.05	1.20	2.75	1.75
0.04600	16.97	14.11	1.20	2.75	1.75
0.04640	17.04	14.17	1.20	2.75	1.75
0.04680	17.12	14.23	1.20	2.75	1.75
0.04720	17.19	14.29	1.20	2.75	1.75
0.04760	17.26	14.35	1.20	2.75	1.75
0.04800	17.34	14.42	1.20	2.75	1.75
0.04840	17.41	14.48	1.20	2.75	1.75
0.04880	17.48	14.53	1.20	2.75	1.75
0.04920	17.55	14.59	1.20	2.75	1.75
0.04960	17.62	14.65	1.20	2.75	1.75
0.05000	17.69	14.71	1.20	2.75	1.75
0.05040	17.76	14.77	1.20	2.75	1.75
0.05080	17.83	14.83	1.20	2.75	1.75
0.05120	17.91	14.89	1.20	2.75	1.75
0.05160	17.97	14.95	1.20	2.75	1.75
0.05200	18.04	15.00	1.20	2.75	1.75
0.05240	18.11	15.06	1.20	2.75	1.75
0.05280	18.18	15.12	1.20	2.75	1.75
0.05320	18.25	15.18	1.20	2.75	1.75
0.05360	18.32	15.23	1.20	2.75	1.75
0.05400	18.39	15.29	1.20	2.75	1.75
0.05440	18.46	15.35	1.20	2.75	1.75
0.05480	18.52	15.40	1.20	2.75	1.75
0.05520	18.59	15.46	1.20	2.75	1.75
0.05560	18.66	15.51	1.20	2.75	1.75
0.05600	18.73	15.57	1.20	2.75	1.75
0.05640	18.79	15.63	1.20	2.75	1.75
0.05680	18.86	15.68	1.20	2.75	1.75
0.05720	18.93	15.74	1.20	2.75	1.75
0.05760	18.99	15.79	1.20	2.75	1.75
0.05800	19.06	15.85	1.20	2.75	1.75

Rating Table for 21 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05840	19.12	15.90	1.20	2.75	1.75
0.05880	19.19	15.96	1.20	2.75	1.75
0.05920	19.25	16.01	1.20	2.75	1.75
0.05960	19.32	16.06	1.20	2.75	1.75
0.06000	19.38	16.12	1.20	2.75	1.75

Rating Table for 24 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	1.00	ft
Diameter	2.00	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00100	3.55	2.26	1.57	3.14	2.00
0.00140	4.22	2.69	1.57	3.14	2.00
0.00180	4.79	3.05	1.57	3.14	2.00
0.00220	5.31	3.38	1.57	3.14	2.00
0.00260	5.77	3.68	1.57	3.14	2.00
0.00300	6.21	3.95	1.57	3.14	2.00
0.00340	6.61	4.21	1.57	3.14	2.00
0.00380	6.99	4.45	1.57	3.14	2.00
0.00420	7.35	4.68	1.57	3.14	2.00
0.00460	7.70	4.90	1.57	3.14	2.00
0.00500	8.03	5.11	1.57	3.14	2.00
0.00540	8.34	5.31	1.57	3.14	2.00
0.00580	8.65	5.51	1.57	3.14	2.00
0.00620	8.94	5.69	1.57	3.14	2.00
0.00660	9.23	5.88	1.57	3.14	2.00
0.00700	9.51	6.05	1.57	3.14	2.00
0.00740	9.77	6.22	1.57	3.14	2.00
0.00780	10.04	6.39	1.57	3.14	2.00
0.00820	10.29	6.55	1.57	3.14	2.00
0.00860	10.54	6.71	1.57	3.14	2.00
0.00900	10.78	6.86	1.57	3.14	2.00
0.00940	11.02	7.02	1.57	3.14	2.00
0.00980	11.25	7.16	1.57	3.14	2.00
0.01020	11.48	7.31	1.57	3.14	2.00
0.01060	11.70	7.45	1.57	3.14	2.00

Rating Table for 24 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.01100	11.92	7.59	1.57	3.14	2.00
0.01140	12.14	7.73	1.57	3.14	2.00
0.01180	12.35	7.86	1.57	3.14	2.00
0.01220	12.56	8.00	1.57	3.14	2.00
0.01260	12.76	8.13	1.57	3.14	2.00
0.01300	12.96	8.25	1.57	3.14	2.00
0.01340	13.16	8.38	1.57	3.14	2.00
0.01380	13.36	8.50	1.57	3.14	2.00
0.01420	13.55	8.63	1.57	3.14	2.00
0.01460	13.74	8.75	1.57	3.14	2.00
0.01500	13.93	8.87	1.57	3.14	2.00
0.01540	14.11	8.98	1.57	3.14	2.00
0.01580	14.30	9.10	1.57	3.14	2.00
0.01620	14.48	9.22	1.57	3.14	2.00
0.01660	14.65	9.33	1.57	3.14	2.00
0.01700	14.83	9.44	1.57	3.14	2.00
0.01740	15.00	9.55	1.57	3.14	2.00
0.01780	15.18	9.66	1.57	3.14	2.00
0.01820	15.35	9.77	1.57	3.14	2.00
0.01860	15.51	9.88	1.57	3.14	2.00
0.01900	15.68	9.98	1.57	3.14	2.00
0.01940	15.84	10.09	1.57	3.14	2.00
0.01980	16.01	10.19	1.57	3.14	2.00
0.02020	16.17	10.29	1.57	3.14	2.00
0.02060	16.33	10.39	1.57	3.14	2.00
0.02100	16.48	10.49	1.57	3.14	2.00
0.02140	16.64	10.59	1.57	3.14	2.00
0.02180	16.80	10.69	1.57	3.14	2.00
0.02220	16.95	10.79	1.57	3.14	2.00
0.02260	17.10	10.89	1.57	3.14	2.00
0.02300	17.25	10.98	1.57	3.14	2.00
0.02340	17.40	11.08	1.57	3.14	2.00
0.02380	17.55	11.17	1.57	3.14	2.00
0.02420	17.70	11.27	1.57	3.14	2.00
0.02460	17.84	11.36	1.57	3.14	2.00
0.02500	17.99	11.45	1.57	3.14	2.00
0.02540	18.13	11.54	1.57	3.14	2.00

Rating Table for 24 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02580	18.27	11.63	1.57	3.14	2.00
0.02620	18.42	11.72	1.57	3.14	2.00
0.02660	18.56	11.81	1.57	3.14	2.00
0.02700	18.69	11.90	1.57	3.14	2.00
0.02740	18.83	11.99	1.57	3.14	2.00
0.02780	18.97	12.08	1.57	3.14	2.00
0.02820	19.11	12.16	1.57	3.14	2.00
0.02860	19.24	12.25	1.57	3.14	2.00
0.02900	19.38	12.33	1.57	3.14	2.00
0.02940	19.51	12.42	1.57	3.14	2.00
0.02980	19.64	12.50	1.57	3.14	2.00
0.03020	19.77	12.59	1.57	3.14	2.00
0.03060	19.90	12.67	1.57	3.14	2.00
0.03100	20.03	12.75	1.57	3.14	2.00
0.03140	20.16	12.84	1.57	3.14	2.00
0.03180	20.29	12.92	1.57	3.14	2.00
0.03220	20.42	13.00	1.57	3.14	2.00
0.03260	20.54	13.08	1.57	3.14	2.00
0.03300	20.67	13.16	1.57	3.14	2.00
0.03340	20.79	13.24	1.57	3.14	2.00
0.03380	20.92	13.32	1.57	3.14	2.00
0.03420	21.04	13.40	1.57	3.14	2.00
0.03460	21.17	13.47	1.57	3.14	2.00
0.03500	21.29	13.55	1.57	3.14	2.00
0.03540	21.41	13.63	1.57	3.14	2.00
0.03580	21.53	13.71	1.57	3.14	2.00
0.03620	21.65	13.78	1.57	3.14	2.00
0.03660	21.77	13.86	1.57	3.14	2.00
0.03700	21.89	13.93	1.57	3.14	2.00
0.03740	22.01	14.01	1.57	3.14	2.00
0.03780	22.12	14.08	1.57	3.14	2.00
0.03820	22.24	14.16	1.57	3.14	2.00
0.03860	22.36	14.23	1.57	3.14	2.00
0.03900	22.47	14.31	1.57	3.14	2.00
0.03940	22.59	14.38	1.57	3.14	2.00
0.03980	22.70	14.45	1.57	3.14	2.00

Rating Table for 18 inch - 3/4 Full

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.0040 ft/ft
Normal Depth	13.50 in
Diameter	18.0 in

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0008	2.66	1.87	1.4	3.1	1.30
0.0012	3.28	2.31	1.4	3.1	1.30
0.0016	3.80	2.67	1.4	3.1	1.30
0.0020	4.26	2.99	1.4	3.1	1.30
0.0024	4.67	3.28	1.4	3.1	1.30
0.0028	5.05	3.55	1.4	3.1	1.30
0.0032	5.40	3.80	1.4	3.1	1.30
0.0036	5.73	4.03	1.4	3.1	1.30
0.0040	6.04	4.25	1.4	3.1	1.30
0.0044	6.34	4.46	1.4	3.1	1.30
0.0048	6.62	4.66	1.4	3.1	1.30
0.0052	6.90	4.85	1.4	3.1	1.30
0.0056	7.16	5.03	1.4	3.1	1.30
0.0060	7.41	5.21	1.4	3.1	1.30
0.0064	7.65	5.38	1.4	3.1	1.30
0.0068	7.89	5.55	1.4	3.1	1.30
0.0072	8.12	5.71	1.4	3.1	1.30
0.0076	8.34	5.87	1.4	3.1	1.30
0.0080	8.56	6.02	1.4	3.1	1.30
0.0084	8.77	6.17	1.4	3.1	1.30
0.0088	8.98	6.32	1.4	3.1	1.30
0.0092	9.18	6.46	1.4	3.1	1.30
0.0096	9.38	6.60	1.4	3.1	1.30
0.0100	9.57	6.73	1.4	3.1	1.30
0.0104	9.76	6.87	1.4	3.1	1.30
0.0108	9.95	7.00	1.4	3.1	1.30
0.0112	10.13	7.13	1.4	3.1	1.30
0.0116	10.31	7.25	1.4	3.1	1.30
0.0120	10.49	7.38	1.4	3.1	1.30
0.0124	10.66	7.50	1.4	3.1	1.30
0.0128	10.84	7.62	1.4	3.1	1.30
0.0132	11.00	7.74	1.4	3.1	1.30
0.0136	11.17	7.86	1.4	3.1	1.30
0.0140	11.33	7.97	1.4	3.1	1.30
0.0144	11.49	8.09	1.4	3.1	1.30
0.0148	11.65	8.20	1.4	3.1	1.30
0.0152	11.81	8.31	1.4	3.1	1.30
0.0156	11.96	8.42	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0160	12.12	8.52	1.4	3.1	1.30
0.0164	12.27	8.63	1.4	3.1	1.30
0.0168	12.42	8.73	1.4	3.1	1.30
0.0172	12.56	8.84	1.4	3.1	1.30
0.0176	12.71	8.94	1.4	3.1	1.30
0.0180	12.85	9.04	1.4	3.1	1.30
0.0184	13.00	9.14	1.4	3.1	1.30
0.0188	13.14	9.24	1.4	3.1	1.30
0.0192	13.28	9.34	1.4	3.1	1.30
0.0196	13.41	9.44	1.4	3.1	1.30
0.0200	13.55	9.53	1.4	3.1	1.30
0.0204	13.69	9.63	1.4	3.1	1.30
0.0208	13.82	9.72	1.4	3.1	1.30
0.0212	13.95	9.81	1.4	3.1	1.30
0.0216	14.08	9.91	1.4	3.1	1.30
0.0220	14.21	10.00	1.4	3.1	1.30
0.0224	14.34	10.09	1.4	3.1	1.30
0.0228	14.47	10.18	1.4	3.1	1.30
0.0232	14.60	10.27	1.4	3.1	1.30
0.0236	14.72	10.35	1.4	3.1	1.30
0.0240	14.85	10.44	1.4	3.1	1.30
0.0244	14.97	10.53	1.4	3.1	1.30
0.0248	15.09	10.62	1.4	3.1	1.30
0.0252	15.21	10.70	1.4	3.1	1.30
0.0256	15.33	10.79	1.4	3.1	1.30
0.0260	15.45	10.87	1.4	3.1	1.30
0.0264	15.57	10.95	1.4	3.1	1.30
0.0268	15.69	11.04	1.4	3.1	1.30
0.0272	15.81	11.12	1.4	3.1	1.30
0.0276	15.92	11.20	1.4	3.1	1.30
0.0280	16.04	11.28	1.4	3.1	1.30
0.0284	16.15	11.36	1.4	3.1	1.30
0.0288	16.26	11.44	1.4	3.1	1.30
0.0292	16.38	11.52	1.4	3.1	1.30
0.0296	16.49	11.60	1.4	3.1	1.30
0.0300	16.60	11.68	1.4	3.1	1.30
0.0304	16.71	11.75	1.4	3.1	1.30
0.0308	16.82	11.83	1.4	3.1	1.30
0.0312	16.93	11.91	1.4	3.1	1.30
0.0316	17.04	11.98	1.4	3.1	1.30
0.0320	17.14	12.06	1.4	3.1	1.30
0.0324	17.25	12.13	1.4	3.1	1.30
0.0328	17.36	12.21	1.4	3.1	1.30
0.0332	17.46	12.28	1.4	3.1	1.30
0.0336	17.57	12.36	1.4	3.1	1.30
0.0340	17.67	12.43	1.4	3.1	1.30
0.0344	17.78	12.50	1.4	3.1	1.30
0.0348	17.88	12.58	1.4	3.1	1.30
0.0352	17.98	12.65	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0356	18.08	12.72	1.4	3.1	1.30
0.0360	18.19	12.79	1.4	3.1	1.30
0.0364	18.29	12.86	1.4	3.1	1.30
0.0368	18.39	12.93	1.4	3.1	1.30
0.0372	18.49	13.00	1.4	3.1	1.30
0.0376	18.59	13.07	1.4	3.1	1.30
0.0380	18.68	13.14	1.4	3.1	1.30
0.0384	18.78	13.21	1.4	3.1	1.30
0.0388	18.88	13.28	1.4	3.1	1.30
0.0392	18.98	13.35	1.4	3.1	1.30
0.0396	19.07	13.42	1.4	3.1	1.30
0.0400	19.17	13.48	1.4	3.1	1.30
0.0404	19.27	13.55	1.4	3.1	1.30
0.0408	19.36	13.62	1.4	3.1	1.30
0.0412	19.46	13.69	1.4	3.1	1.30
0.0416	19.55	13.75	1.4	3.1	1.30
0.0420	19.64	13.82	1.4	3.1	1.30
0.0424	19.74	13.88	1.4	3.1	1.30
0.0428	19.83	13.95	1.4	3.1	1.30
0.0432	19.92	14.01	1.4	3.1	1.30
0.0436	20.01	14.08	1.4	3.1	1.30
0.0440	20.11	14.14	1.4	3.1	1.30
0.0444	20.20	14.21	1.4	3.1	1.30
0.0448	20.29	14.27	1.4	3.1	1.30
0.0452	20.38	14.33	1.4	3.1	1.30
0.0456	20.47	14.40	1.4	3.1	1.30
0.0460	20.56	14.46	1.4	3.1	1.30
0.0464	20.65	14.52	1.4	3.1	1.30
0.0468	20.74	14.59	1.4	3.1	1.30
0.0472	20.83	14.65	1.4	3.1	1.30
0.0476	20.91	14.71	1.4	3.1	1.30
0.0480	21.00	14.77	1.4	3.1	1.30
0.0484	21.09	14.83	1.4	3.1	1.30
0.0488	21.18	14.89	1.4	3.1	1.30
0.0492	21.26	14.96	1.4	3.1	1.30
0.0496	21.35	15.02	1.4	3.1	1.30
0.0500	21.43	15.08	1.4	3.1	1.30
0.0504	21.52	15.14	1.4	3.1	1.30
0.0508	21.61	15.20	1.4	3.1	1.30
0.0512	21.69	15.26	1.4	3.1	1.30
0.0516	21.77	15.32	1.4	3.1	1.30
0.0520	21.86	15.38	1.4	3.1	1.30
0.0524	21.94	15.43	1.4	3.1	1.30
0.0528	22.03	15.49	1.4	3.1	1.30
0.0532	22.11	15.55	1.4	3.1	1.30
0.0536	22.19	15.61	1.4	3.1	1.30
0.0540	22.28	15.67	1.4	3.1	1.30
0.0544	22.36	15.73	1.4	3.1	1.30
0.0548	22.44	15.78	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0552	22.52	15.84	1.4	3.1	1.30
0.0556	22.60	15.90	1.4	3.1	1.30
0.0560	22.68	15.96	1.4	3.1	1.30
0.0564	22.77	16.01	1.4	3.1	1.30
0.0568	22.85	16.07	1.4	3.1	1.30
0.0572	22.93	16.13	1.4	3.1	1.30
0.0576	23.01	16.18	1.4	3.1	1.30
0.0580	23.09	16.24	1.4	3.1	1.30
0.0584	23.17	16.29	1.4	3.1	1.30
0.0588	23.25	16.35	1.4	3.1	1.30
0.0592	23.32	16.41	1.4	3.1	1.30
0.0596	23.40	16.46	1.4	3.1	1.30
0.0600	23.48	16.52	1.4	3.1	1.30
0.0604	23.56	16.57	1.4	3.1	1.30
0.0608	23.64	16.63	1.4	3.1	1.30
0.0612	23.71	16.68	1.4	3.1	1.30
0.0616	23.79	16.74	1.4	3.1	1.30
0.0620	23.87	16.79	1.4	3.1	1.30
0.0624	23.95	16.84	1.4	3.1	1.30
0.0628	24.02	16.90	1.4	3.1	1.30
0.0632	24.10	16.95	1.4	3.1	1.30
0.0636	24.18	17.01	1.4	3.1	1.30
0.0640	24.25	17.06	1.4	3.1	1.30
0.0644	24.33	17.11	1.4	3.1	1.30
0.0648	24.40	17.16	1.4	3.1	1.30
0.0652	24.48	17.22	1.4	3.1	1.30
0.0656	24.55	17.27	1.4	3.1	1.30
0.0660	24.63	17.32	1.4	3.1	1.30
0.0664	24.70	17.38	1.4	3.1	1.30
0.0668	24.78	17.43	1.4	3.1	1.30
0.0672	24.85	17.48	1.4	3.1	1.30
0.0676	24.92	17.53	1.4	3.1	1.30
0.0680	25.00	17.58	1.4	3.1	1.30
0.0684	25.07	17.64	1.4	3.1	1.30
0.0688	25.14	17.69	1.4	3.1	1.30
0.0692	25.22	17.74	1.4	3.1	1.30
0.0696	25.29	17.79	1.4	3.1	1.30
0.0700	25.36	17.84	1.4	3.1	1.30
0.0704	25.44	17.89	1.4	3.1	1.30
0.0708	25.51	17.94	1.4	3.1	1.30
0.0712	25.58	17.99	1.4	3.1	1.30
0.0716	25.65	18.04	1.4	3.1	1.30
0.0720	25.72	18.09	1.4	3.1	1.30
0.0724	25.79	18.14	1.4	3.1	1.30
0.0728	25.87	18.19	1.4	3.1	1.30
0.0732	25.94	18.24	1.4	3.1	1.30
0.0736	26.01	18.29	1.4	3.1	1.30
0.0740	26.08	18.34	1.4	3.1	1.30
0.0744	26.15	18.39	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

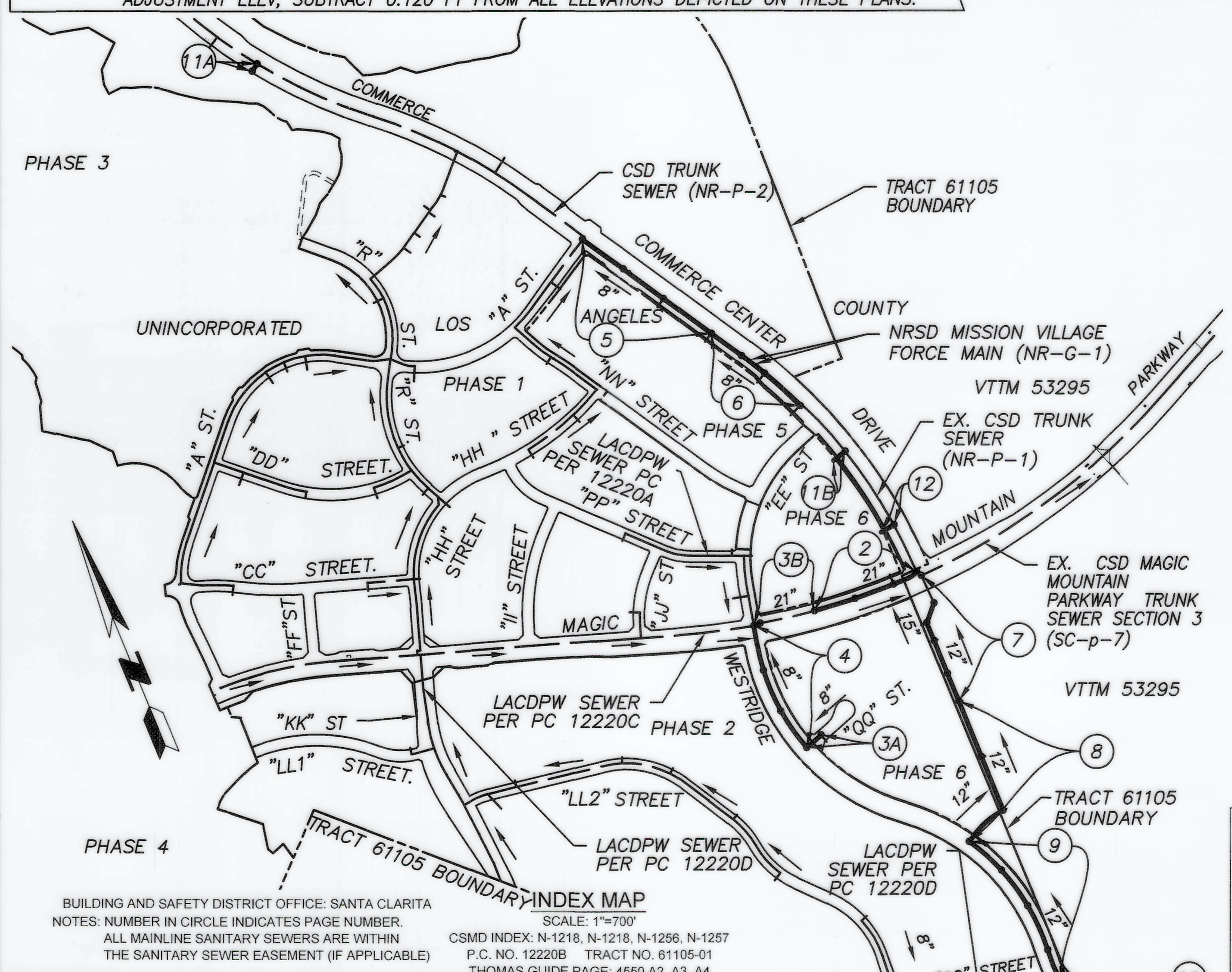
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0748	26.22	18.44	1.4	3.1	1.30
0.0752	26.29	18.49	1.4	3.1	1.30
0.0756	26.36	18.54	1.4	3.1	1.30
0.0760	26.43	18.59	1.4	3.1	1.30
0.0764	26.50	18.64	1.4	3.1	1.30
0.0768	26.57	18.69	1.4	3.1	1.30
0.0772	26.64	18.74	1.4	3.1	1.30
0.0776	26.71	18.78	1.4	3.1	1.30
0.0780	26.77	18.83	1.4	3.1	1.30
0.0784	26.84	18.88	1.4	3.1	1.30
0.0788	26.91	18.93	1.4	3.1	1.30
0.0792	26.98	18.98	1.4	3.1	1.30
0.0796	27.05	19.03	1.4	3.1	1.30
0.0800	27.12	19.07	1.4	3.1	1.30

Bentley Systems, Inc. Haestad Methods Solution Center
27 Siemon Company Drive Suite 200 W
Watertown, CT 06795 USA +1-203-755-1666

4. Existing Sewer Plans: PC 12220B, PC 12220E, PC 11839

BENCH MARK:	NEWHALL QUAD (2009) NAVD 88 LACDPW L 5402 RND HD SPK IN LOWER OF TWO CONC HDWLS @ N END 24' W/O C/L THE OLD RD (W RDWY) & 0.6MI S/O HENRY MAYO DR @ MI MKR #6.25
ELEV.	1031.831 FEET **ADJUSTMENT** 2009

SURVEYOR'S NOTE: TOPO & DESIGN ELEV ARE BASED ON 1995 ADJUSTMENT. TO ACQUIRE 2009 ADJUSTMENT ELEV, SUBTRACT 0.120 FT FROM ALL ELEVATIONS DEPICTED ON THESE PLANS.



INDEX MAP
SCALE: 1"=700'

CSMD INDEX: N-1218, N-1218, N-1256, N-1257
P.C. NO. 12220B TRACT NO. 61105-01
THOMAS GUIDE PAGE: 4550 A2, A3, A4

BUILDING AND SAFETY DISTRICT OFFICE: SANTA CLARITA
NOTES: NUMBER IN CIRCLE INDICATES PAGE NUMBER.
ALL MAINLINE SANITARY SEWERS ARE WITHIN THE SANITARY SEWER EASEMENT (IF APPLICABLE)

NO.	REVISION	REVISED BY	APPROVED BY	DATE

Per Title 20.24.140 of LA County Code, obstructing access to sewer facilities is prohibited. No object difficult to remove shall be located over the sewer easement(s) as to interfere with ready access to sewer facilities.

STORMWATER POLLUTION PLAN NOTES

A.NOTES:

1. Every effort should be made to eliminate the discharge of non-stormwater from the project site at all times.
2. Eroded sediments and other pollutants must be retained on-site and may not be transported from the site via sheet flow, swales, area drains, natural drainage courses or wind.
3. Stockpiles of earth and other construction related materials must be protected from being transported from the site by the forces of wind or water.
4. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil and surface waters. All approved storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
5. Excess or waste concrete may not be washed into the public way or any other drainage system. Provisions shall be made to retain concrete wastes on-site until they can be disposed of as solid waste.
6. Trash and construction related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
7. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
8. Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.
9. The following BMPs as outlined in, but not limited to, the latest edition of the California BMP Handbook (Construction) or Caltrans Stormwater Quality Handbooks (Construction Site BMP Manual), may apply during the construction of this project (additional measures may be required if deemed appropriate by the Project Engineer or the Building Official)

EROSION CONTROL
EC1 SCHEDULING
EC2 PRESERVATION OF EXISTING VEGETATION
EC3 HYDRAULIC MULCH
EC4 HYDROSEEDING
EC5 SOIL BINDERS
EC6 STRAW MULCH
EC7 GEOTEXTILES & MATS
EC8 WOOD MULCHING
EC9 EARTH DIKES AND DRAINAGE SWALES
EC10 VELOCITY DISSIPATION DEVICES
EC11 SLOPE DRAINS
EC12 STREAMBANK STABILIZATION
EC13 RESERVED
EC14 COMPOST BLANKETS
EC15 SOIL PREPARATION\ROUGHENING
EC16 NON-VEGETATED STABILIZATION

WIND EROSION CONTROL
WE1 WIND EROSION CONTROL

EQUIPMENT TRACKING CONTROL
TC1 STABILIZED CONSTRUCTION ENTRANCE EXIT
TC2 STABILIZED CONSTRUCTION ROADWAY
TC3 ENTRANCE/OUTLET TIRE WASH

NON-STORM WATER MANAGEMENT
NS1 WATER CONSERVATION PRACTICES
NS2 DEWATERING OPERATIONS
NS3 PAVING AND GRINDING OPERATIONS
NS4 TEMPORARY STREAM CROSSING
NS5 CLEAR WATER DIVERSION
NS6 ILLICIT CONNECTION/DISCHARGE
NS7 POTABLE WATER/IRRIGATION
NS8 VEHICLE AND EQUIPMENT CLEANING
NS9 VEHICLE AND EQUIPMENT FUELING
NS10 VEHICLE AND EQUIPMENT MAINTENANCE
NS11 PILE DRIVING OPERATIONS
NS12 CONCRETE CURING
NS13 CONCRETE FINISHING
NS14 MATERIAL AND EQUIPMENT USE
NS15 DEMOLITION ADJACENT TO WATER
NS16 TEMPORARY BATCH PLANTS

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL
WM1 MATERIAL DELIVERY AND STORAGE
WM2 MATERIAL USE
WM3 STOCKPILE MANAGEMENT
WM4 SPILL PREVENTION AND CONTROL
WM5 SOLID WASTE MANAGEMENT
WM6 HAZARDOUS WASTE MANAGEMENT
WM7 CONTAMINATION SOIL MANAGEMENT
WM8 CONCRETE WASTE MANAGEMENT
WM9 SANITARY/SEPTIC WASTE MANAGEMENT
WM10 LIQUID WASTE MANAGEMENT

TEMPORARY SEDIMENT CONTROL
SE1 SILT FENCE
SE2 SEDIMENT BASIN
SE3 SEDIMENT TRAP
SE4 CHECK DAM
SE5 FIBER ROLLS
SE6 GRAVEL BAG BERM
SE7 STREET SWEEPING AND VACUUMING
SE8 SANDBAG BARRIER
SE9 STRAW BALE BARRIER
SE10 STORM DRAIN INLET PROTECTION
SE11 ACTIVE TREATMENT SYSTEMS
SE12 TEMPORARY SILT DIKE
SE13 COMPOST SOCKS & BERMS
SE14 BIOFILTER BAGS

B. STANDARD PLANS:

The following latest revised standard plans on file in the office of the following department shall apply in the construction of this project.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

2000-0	Legend for sanitary sewer plans and profiles and district maps.	2021-1	Bedding for sewer pipe.
2002-1	Precast concrete shallow manhole.	2023-2	Cradling and encasement.
2003-2	Reinforced precast concrete manhole.	2024-1	WYE or TEE support.
2004-1	Rectangular shallow manhole.	2026-1	Erosion protection in steep slopes.
2014-1	Rectangular manhole frame and cover.	2027-1	Allowable trench widths.
2015-1	Standard manhole step.	6008-1	Minimum public safety requirements.
		2100-1	Requirement's for sanitary sewers near water mains

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION (SPPWC)

200-3	Precast concrete sewer manhole	221-2	Pipe anchors and backfill stabilizers
207-2	Precast reinforced concrete manhole base	222-2	House connection sewer
208-2	Breaking into existing manholes	223-2	House connection remodeling
210-3	Manhole frame and cover locking type	225-2	Bianket protection for pipes
220-3	Chimneys		

COUNTY SANITATION DISTRICT (CSD) NOTES:

1. No connection for the disposal of industrial wastes shall be made to sewers shown on these drawings until a permit for industrial waste water discharge has been issued by the County Sanitation Districts for said connections.
2. At least three (3) working days prior to breaking into or connecting to County Sanitation Districts' sewer or manhole and prior to final acceptance of the project, a County Sanitation Districts' inspector shall be notified by telephone at (661) 257-4809 so that required inspection can be made.
3. All work involving CSD sewer or manholes shall be in accordance with the latest edition of the Standard Specifications for Public Works Construction, and CSD's latest Amendments to the Standard Specifications for Public Works Construction and Standard Drawings for Construction. A copy of the Amendments and Standard Drawings may be obtained at the Public Counter (Room 110) located at CSD's Joint Administration Office, 1955 Workman Mill Road, Whittier, Ca 90601.
4. The County Sanitation Districts is a public agency comprised of more than 20 separate sanitation districts serving LA County, including the Santa Clarita Valley Sanitation District (SCVSD) and the Newhall Ranch Sanitation District (NRSD). CSD has one staff serving all its sanitation districts with headquarters in Whittier.
5. Protect existing concrete manhole shaft when necessary. Backfill around CSD manhole using 1.5 sack slurry. Send MH Shoring (when applicable) and 1.5 sack slurry mix (having 141 pounds of cement per cubic yard of slurry) to the CSD Sewer Design Section for approval prior to the start of the construction. Allow 3 weeks for review of each submittal.
6. Perform video inspection of the completed connection inside the manhole (when applicable) and provide video to CSD inspector to confirm satisfactory completion of the work.
7. CSD is not responsible for any personal injury or property damage relating to the work on these sewer plans. The project owner shall indemnify and hold harmless CSD from any claims, damage or losses relating to the work on these .

NOTICE TO CONTRACTOR

Issue no house lateral connection permits until outlet sewer SC-P-7 & NR-p-1 and NR-p-2 are accepted for public use by the Los Angeles County Sanitation District.

The developer shall be responsible for the continued maintenance of PC 12220B sanitary sewer until the County formally accepts it for maintenance. all mainline, manholes and laterals shall be protected from damage and infiltration.

Maintain sewer flow at all times during construction.

Sewer video of all segments shall be submitted prior to partial field acceptance (95%) and completed field acceptance (98%). Final map and as built sewer plans shall be submitted prior ro partial field acceptance.

All sanitary sewer manhole shafts and frames shall be watertight with Butyl Rubber Mastic joint sealing compound or approved equal by the LA County Public Works.

All proposed utilities shown on this plan, except for sanitary sewer, are to be constructed per separate plan and permit.

PC 12220A, PC 12220B, PC 12220C AND PC 12220D are to be constructed concurrently.

Sewer laterals shown on plans are for reference only

See each page for the lot restriction from construction of buildings and will not be served by this sewer.

Existing sewer system shall be operational at all times during construction/reconstruction. Notify affected homeowners at least 72 hours in advance.

NOTES:
Any damage to the sewer line shall be the responsibility of the contractor/owner. All grading and construction occurring over and the vicinity of the existing sewer shall be performed in the presence of a County inspector. Where applicable, the sewers shall be protected per Std. Plan 2023-2 at all significant crossings.

DIGALERT
DIAL TOLL FREE
1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

PRIVATE CONTRACT SEWER GENERAL NOTES

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the County of Los Angeles Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 8th Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as road excavation, Caltrans, etc., must be filled with the permit application.
2. When work is within a contract city, a sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the City. The contractor must contact the Director of Public Works of that City to determine the location to pay the inspection fees.
3. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate or Worker's Compensation Insurance with the Department of Public Works named as the Certificate Holder or both as applicable. The County of Los Angeles Department of Public Works shall be notified 30 days prior to cancellation of the insurance policy.
4. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles Department of Public Works does not constitute a representation as to accuracy of the location of or the existence or nonexistence of any underground utility pipe or structure within the limits of this project. This note applied to all pages.
7. All work shall be in accordance with the latest approved edition of the "Standard Specification for Public Works Construction" including supplements (if there is any), the latest "Additions and Amendments to the Standard Specifications for Public Works Construction," and the latest "Special Provisions for the Construction for Sanitary Sewer" and shall be prosecuted only in the presence of the County of Los Angeles Department of Public Works.
8. The contractor's attention is direct to Section 7-10.4.2 of the "Standard Specifications for Public Works Construction" in regard to safety orders and shall conform to the "Minimum Public Safety Requirement" as shown on County of Los Angeles Department of Public Works Standard Plan No. 6008-1.
9. Elevations are in feet above U.S.C. and G.S. sea level datum of 1988.
10. No revisions shall be made in these plans without the approval of the County of Los Angeles Department of Public Works.
11. No representative of the County of Los Angeles Department of Public Works will survey or layout any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade point for top of curbs, centerline of streets, or centerline of alleys, is shown by circles on profiles at all points between said designed points. The grade shall be established so as to conform to a straight line drawn between said design points.
13. The private engineer shall furnish the County of Los Angeles Department of Public Work with grade sheets and stationing for all house laterals and "Y" and "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.
15. An approved backwater valve is required when the pad is lower in elevation than the top of the next upstream manhole.
16. Contact Environmental Programs Division for an Industrial Waste Discharge Permit at (626) 458-3517.
17. When work is encroaching into Flood Control District easement and/or crossing its facilities, a Flood Control permit shall be obtained from the Los Angeles County Flood Control District at https://epicla.lacounty.gov at least 4 weeks prior to your desired start-up date. If you need additional information, you may contact Land Development Division – Permits Section Public Counter at 626-458-4921.

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole.
2. Vitrified clay pipe joints shall be type "D" or "G" per "Standard Specifications for Public Works Construction" Section 208-2.
3. If a power pole is within three feet of the sewer, the sewer shall be encased, per LACDPW Standard Plan 2023-2, Case II, two feet on each side from the point of interference.
4. All joints between cast-iron pipe and vitrified clay shall be made with a rubber sleeve joint, type "D" (with bushing if necessary), per "Standard Specifications for Public Works Construction" Section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer, which is not indicated on the plans, the pipes shall be encased per LACDPW Standard Plan 2023-2, Case II, unless otherwise approved by the County of Los Angeles Department of Public Works .
8. All structures shall be either brick sewer manholes per LACDPW Standard Plan S-3 (SPPWC 203-2), or precast concrete sewer manholes per LACDPW Standard Plan S-36 (SPPWC 200-3), or reinforced precast manhole per LACDPW Standard Plan 2003-2, except as noted.
9. Resurface all trenches within paved areas to meet Department of Public Work or California State Highway requirements in accordance with the permits.
10. Full compliance with Section 306-12 of the "Standard Specifications for Public Works Construction" will be required for backfill in street. Certification of backfill, compaction, and sand equivalents by a qualified Civil Engineer shall be provided by the permittee prior to the issuance of a Certificate of Partial Acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90 percent of the maximum density as determined by ASTM Soil Compaction Test D 1557-78, Method "D", unless otherwise specified. This shall be certified by a qualified Civil Engineer. This certification shall be submitted to the Land development Division, Permit Section of the County of Los Angeles Department of Public Works prior to the acceptance of the work by the County .
12. Manhole tops in unimproved rights of way to be six inches above finished grade.
13. Sewers to be tested for leakage per Section 306-7.8 of the "Standard Specification for Public Works Construction" and "Special Provisions for the Construction of Sanitary Sewer" if applicable.
14. Manhole tops in improved rights of way to be level with finished grade.
15. All wyes and/or house laterals are to be located at least 5 feet apart, and when possible, not closer than 5 feet to any manhole.
16. All pipe materials shall be vitrified clay pipe or ductile iron pipe or other approved materials by the County of Los Angeles Department of Public Works .
17. All ductile iron pipes shall be lined with Protecto 401 Ceramic Epoxy lining.
18. Cured in place pipe liner shall be used for all extra vitrified clay pipe if lining is required.
19. All Chimneys shall have terminal cleanout structure per SPPWC std. plan 204-2 and with traffic rated frame and cover.

BASIS OF BEARING

THE BEARINGS SHOWN HEREON ARE BASED ON THE BEARING S55-59-46W OF THE SOUTHEASTERLY LINE OF PARCEL MAP NO. 24500-01 FILED IN BOOK 293 PAGES 34 THROUGH 67, INCLUSIVE, OF PARCEL MAPS, RECORDS OF LOS ANGELES COUNTY.

PROFILE, ALIGNMENT, AND GRADE OF **PAGE 1**

SANITARY SEWERS

TO BE CONSTRUCTED IN

TRACT NO. 61105-01 PC NO. 12220B

6 SHEETS: 12 PAGES

COUNTY OF LOS ANGELES CALIFORNIA

EIMP2019000109

CSMD INDEX: N-1217, N-1218, N-1256, N-1257

MARK PESTRELLA LA COUNTY DIRECTOR OF PUBLIC WORKS
APPROVED BY LAND DEVELOPMENT DIVISION
BY [signature] 6-13-19
ASSISTANT DIVISION ENGINEER DATE
SUBMITTED BY Fabrizio Palaro 6-12-19
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

SANTA CLARITA VALLEY SANITATION DISTRICT
OF LOS ANGELES COUNTY, CALIFORNIA
GRACE ROBINSON HYDE - CHIEF ENGINEER and GENERAL MANAGER
APPROVED BY Anthony Howard FOR OFFICE ENGINEER DATE: 6-20-19

Engineer's/Surveyor's Statement Regarding the Presence of Monuments within project limits.

I hereby attest that I have located and referenced on these plans the monuments existing prior to construction to ensure perpetuation of their location in accordance with section 8771 of the business and professions code. I further attest that I have performed a record search and field inspection to identify existing monuments; shall set sufficient controlling, witness, and permanent monuments; and shall file requisite corner record or record of survey of the references with the County surveyor.

[signature] LS 7295 6/12/2019
Engineer/Surveyor Seal and Signature DATE

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

[signature] 6-12-19
JASON H. FUKUMITSU RCE NO 40695 DATE

TRACT NO. 6105 PC 12220B ①

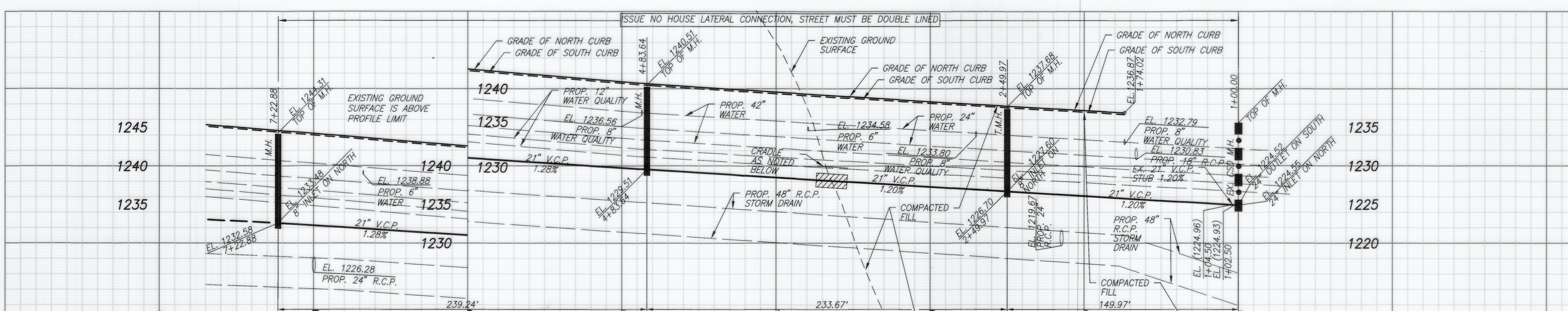
EIMP2019000109 P.C.12220BPAGE 2

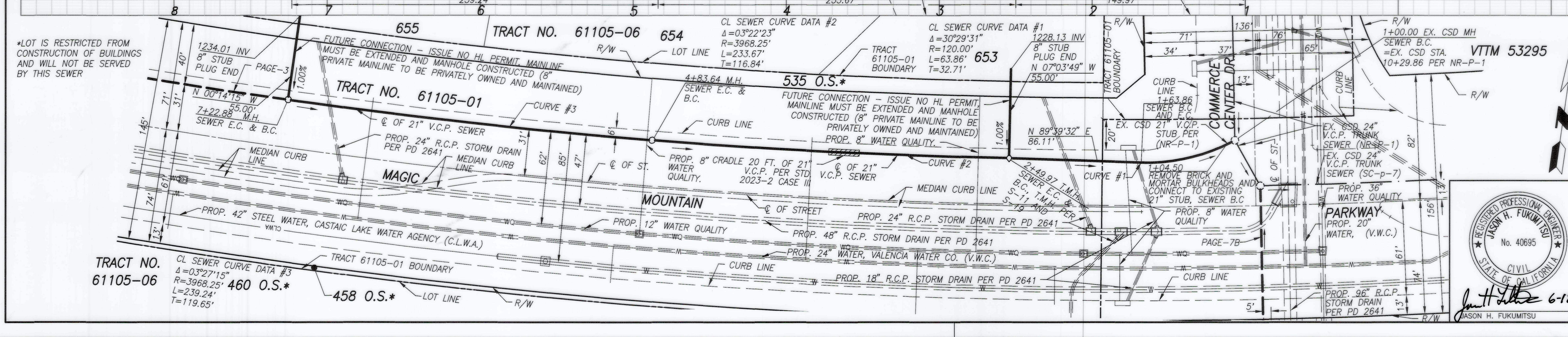
NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE





*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER

PLAN
SCALE: 1" = 40'

SANITARY SEWER PLANS IN
TRACT NO. 61105-01 PC NO. 12220B

REVIEWED BY LAND DEVELOPMENT DIVISION
F.P. BY [signature] 6/12/19
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

[signature] 6-12-19
JASON H. FUKUMITSU DATE

HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
26074 Avenue Hall, Suite #23 • Valencia, CA 91355 • PH: (661) 294-2211 • FX: (661) 294-9890

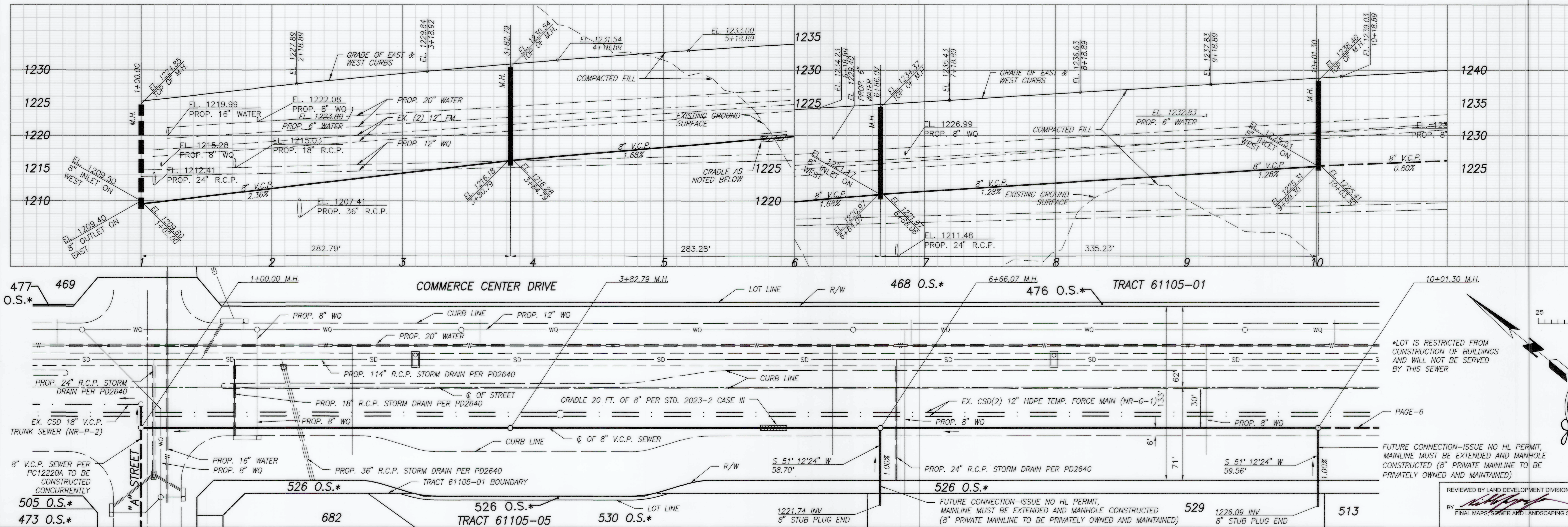
DWG

G:\Newhall Ranch\61105 Mission Village\61105-01\Sewer\MV110-01 PH1 SS PC12220B MMP WP Title.dwg Plotted On Jun 06, 2019-4:56pm by dinor

EIMP2019000109
P.C. 12220B PAGE 3
NO LA COUNTY CHARGES FOR CONNECTION
SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2301
SCALE: VERT. 1" = 8' HORIZ. 1" = 40'
DOUBLE SCALE
ISSUE NO HOUSE LATERAL CONNECTION, STREET MUST BE DOUBLE LINED
EXISTING GROUND SURFACE IS ABOVE PROFILE LIMIT
GRADE OF NORTH CURB
GRADE OF SOUTH CURB
PROP. 12" WQ
PROP. 42" WATER
PROP. 24" WATER
PROP. 48" R.C.P. STORM DRAIN
21" V.C.P. 1.00%
TRACT NO. 61105-06
TRACT NO. 61105-01
TRACT NO. 61105-02
MAGIC MOUNTAIN PARKWAY
WESTRIDGE PKWY
"EE" PVT. DR.
"QQ" ST.
CL SEWER CURVE DATA #1 Δ=04°34'38" R=3969.42' L=317.10' T=158.63'
*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER
FUTURE CONNECTION–ISSUE NO HL PERMIT, MAINLINE MUST BE EXTENDED AND MANHOLE CONSTRUCTED (8" PRIVATE MAINLINE TO BE PRIVATELY OWNED AND MAINTAINED)
8" STUB PLUG END
PLAN
SCALE: 1" = 40'
REVIEWED BY LAND DEVELOPMENT DIVISION
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION
6/12/19
6-12-19
EIMP2019000109
P.C. 12220BPAGE 4
NO LA COUNTY CHARGES FOR CONNECTION
SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2301
SCALE: VERT. 1" = 8' HORIZ. 1" = 40'
DOUBLE SCALE
8" V.C.P. 2.28%
8" V.C.P. 1.96%
8" V.C.P. 0.64%
COMPACTED FILL
CRADLE AS NOTED BELOW
CL SEWER CURVE DATA #1 Δ=07°02'52" R=1195.00' L=147.00' T=73.59'
CL SEWER CURVE DATA #2 Δ=11°59'12" R=1195.00' L=250.00' T=125.46'
CL SEWER CURVE DATA #3 Δ=12°11'50" R=1195.00' L=254.39' T=127.68'
WESTRIDGE PARKWAY
CRADLE 20 FT. OF 8" VCP PER STD. 2032-2 CASE III
PLAN
SCALE: 1" = 40'
REVIEWED BY LAND DEVELOPMENT DIVISION
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION
6/12/19
6-12-19

EIMP2019000109

P.C. 12220B PAGE 5



NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE

PLAN

SCALE: 1" = 40'

*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER

JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

6-12-19

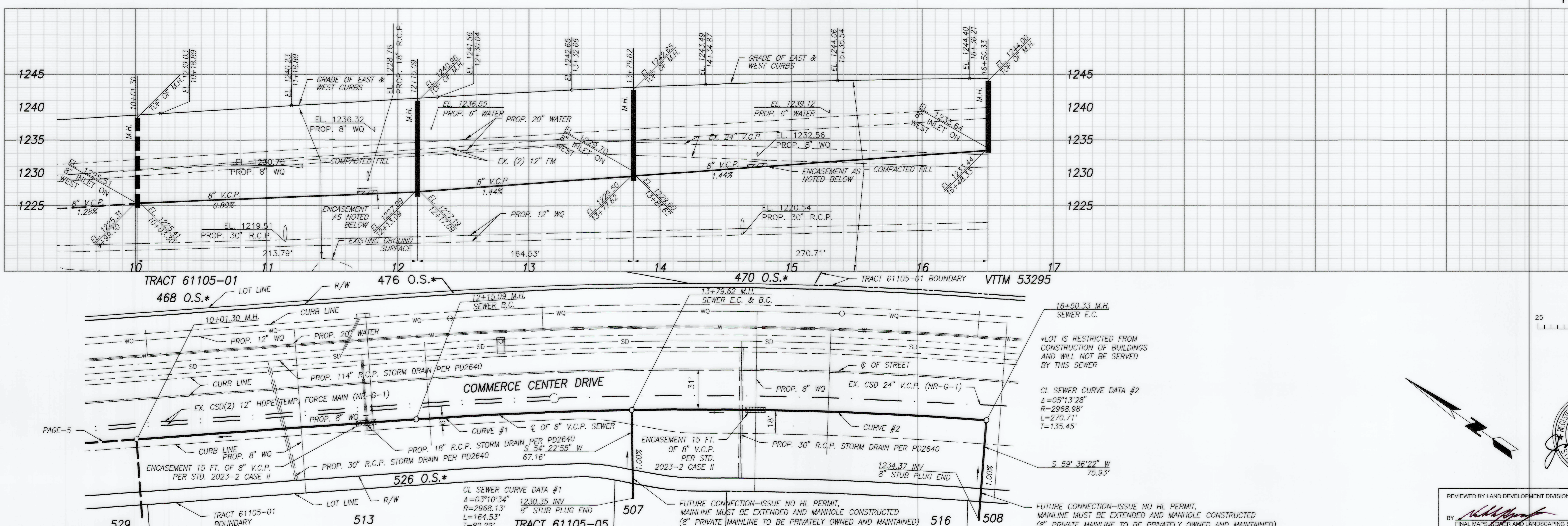
REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

EIMP2019000109

P.C.12220BPAGE 6



NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE

PLAN

SCALE: 1" = 40'

*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER

JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

6-12-19

REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

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P.C. 12220B PAGE 7

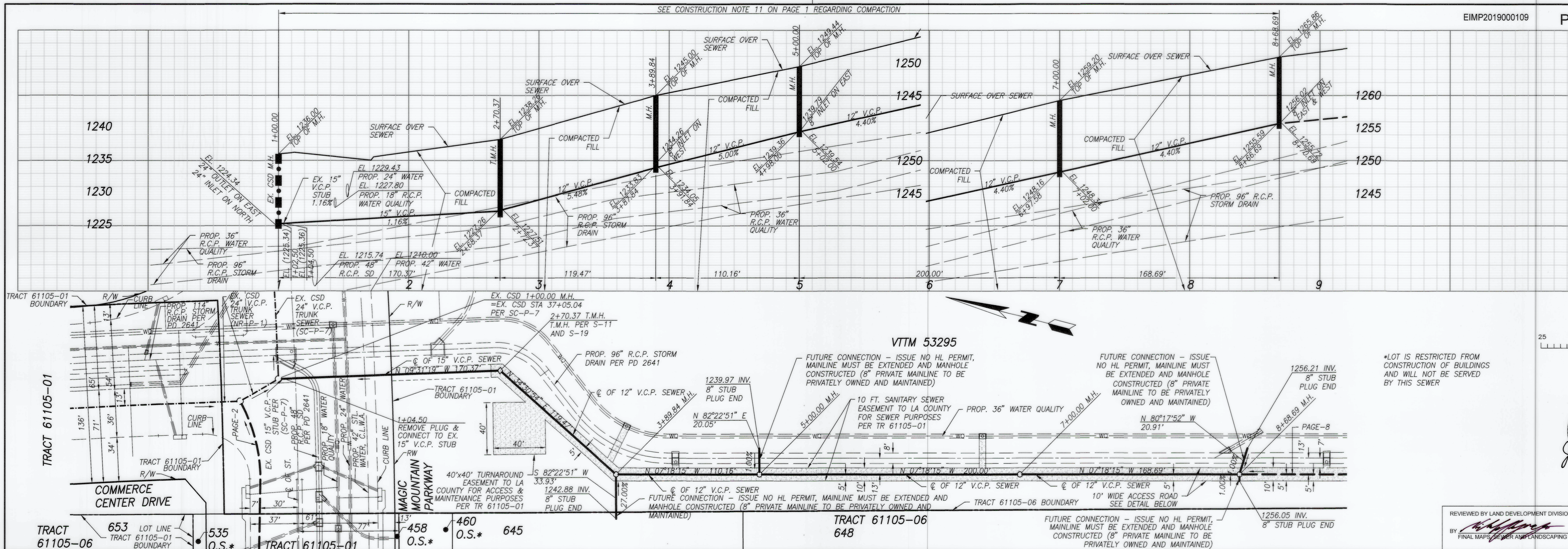
NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE



PLAN

SCALE: 1" = 40'

*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER

REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUNAGA 40695 CIVIL STATE OF CALIFORNIA

6-12-19

REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

EIMP2019000109

P.C.12220BPAGE 8

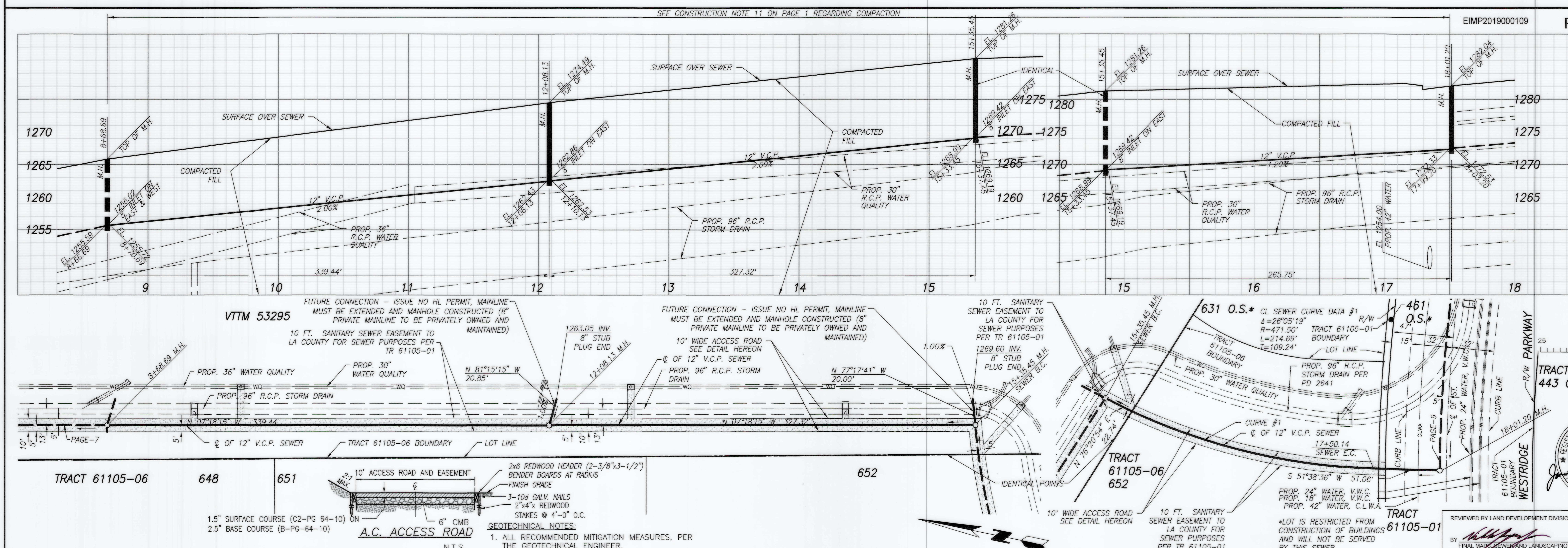
NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE



GEOTECHNICAL NOTES:

1. ALL RECOMMENDED MITIGATION MEASURES, PER THE GEOTECHNICAL ENGINEER.

PLAN

SCALE: 1" = 40'

*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER

REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUNAGA 40695 CIVIL STATE OF CALIFORNIA

6-12-19

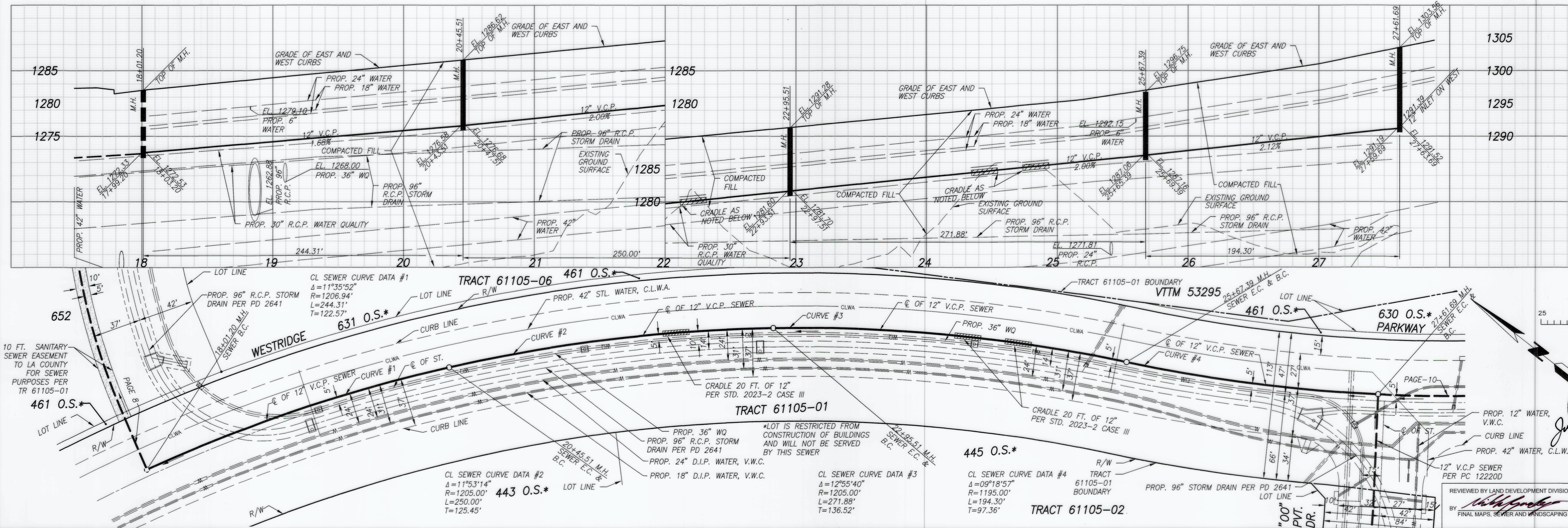
REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

EIMP2019000109

P.C. 12220B PAGE 9



NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE

PLAN

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

6-12-19

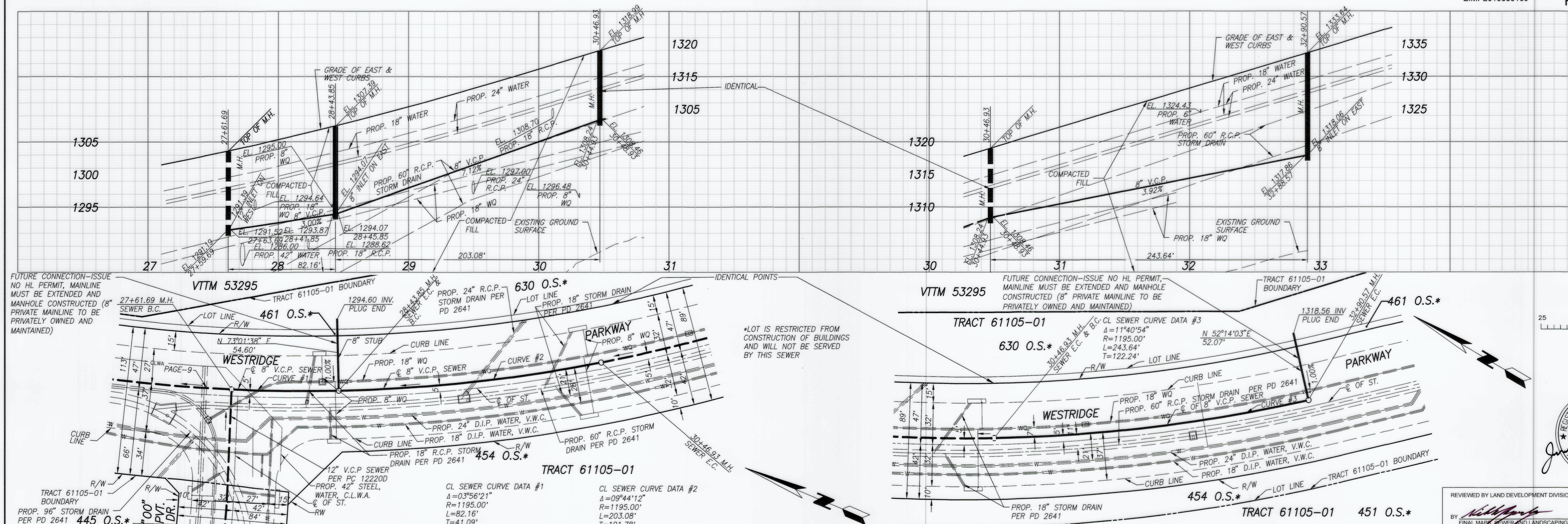
REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

EIMP2019000109

P.C.12220BPAGE 10



NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE

PLAN

SCALE: 1" = 40'

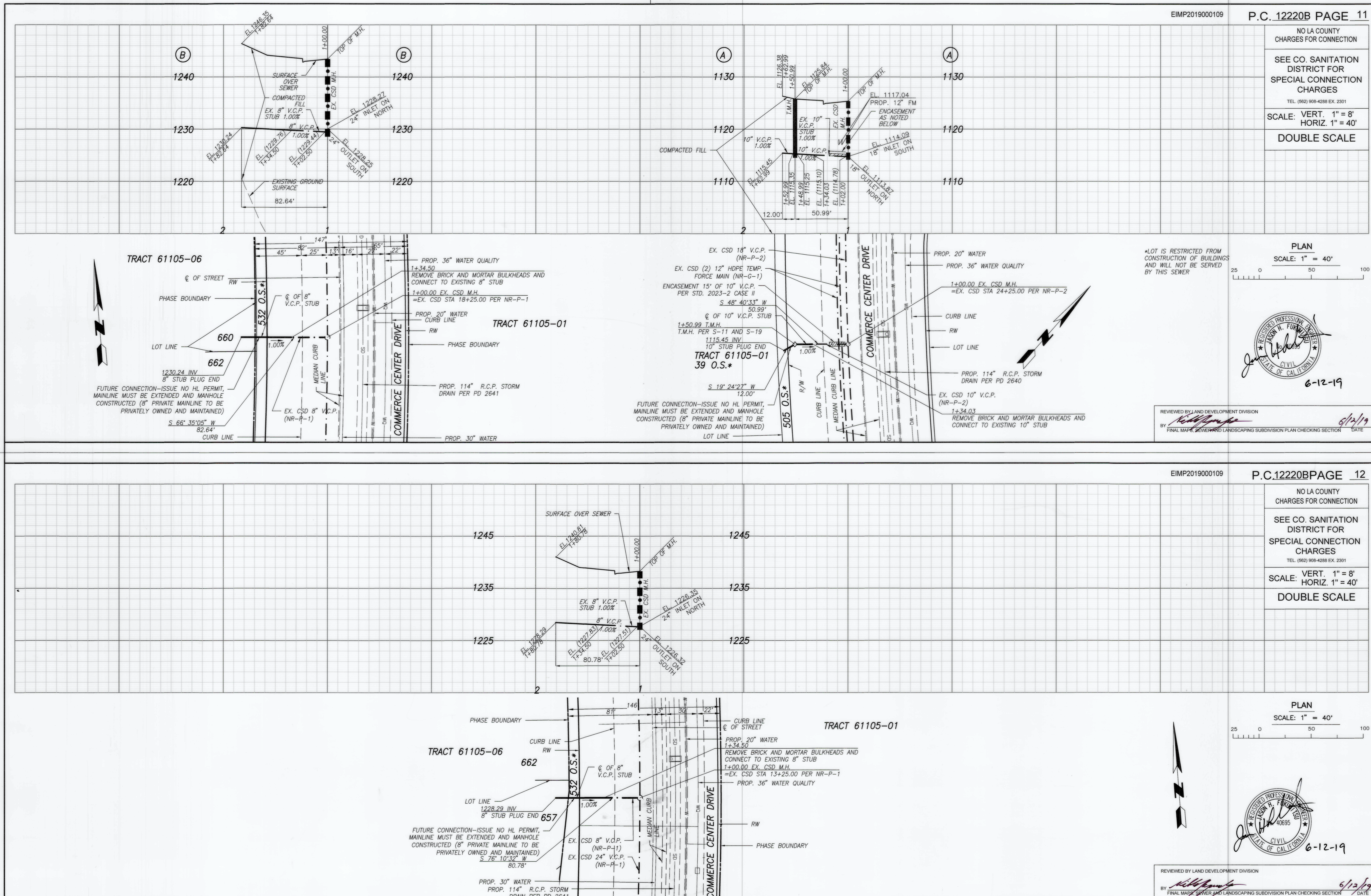
REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

6-12-19

REVIEWED BY LAND DEVELOPMENT DIVISION

BY 6/12/19

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE


EIMP2019000109
P.C. 12220B PAGE 11
NO LA COUNTY CHARGES FOR CONNECTION
SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2301
SCALE: VERT. 1" = 8' HORIZ. 1" = 40'
DOUBLE SCALE
TRACT 61105-06
TRACT 61105-01
COMMERCE CENTER DRIVE
SURFACE OVER SEWER
COMPACTED FILL
EX. 8" V.C.P. STUB 1.00%
EXISTING GROUND SURFACE
EX. CSD M.H.
TOP OF M.H.
PROP. 36" WATER QUALITY
REMOVE BRICK AND MORTAR BULKHEADS AND CONNECT TO EXISTING 8" STUB
PROP. 20" WATER
PROP. 114" R.C.P. STORM DRAIN PER PD 2641
PROP. 30" WATER
FUTURE CONNECTION–ISSUE NO HL PERMIT, MAINLINE MUST BE EXTENDED AND MANHOLE CONSTRUCTED (8" PRIVATE MAINLINE TO BE PRIVATELY OWNED AND MAINTAINED)
PHASE BOUNDARY
LOT LINE
CURB LINE
MEDIAN CURB LINE
*LOT IS RESTRICTED FROM CONSTRUCTION OF BUILDINGS AND WILL NOT BE SERVED BY THIS SEWER
PLAN
SCALE: 1" = 40'
REVIEWED BY LAND DEVELOPMENT DIVISION
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION
DATE
6/12/19
REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUTAKE 40695 CIVIL STATE OF CALIFORNIA
6-12-19
EIMP2019000109
P.C. 12220B PAGE 12
NO LA COUNTY CHARGES FOR CONNECTION
SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
SCALE: VERT. 1" = 8' HORIZ. 1" = 40'
DOUBLE SCALE
TRACT 61105-06
TRACT 61105-01
COMMERCE CENTER DRIVE
1228.29 INV 8" STUB PLUG END
PROP. 114" R.C.P. STORM DRAIN PER PD 2641
REVIEWED BY LAND DEVELOPMENT DIVISION
6-12-19

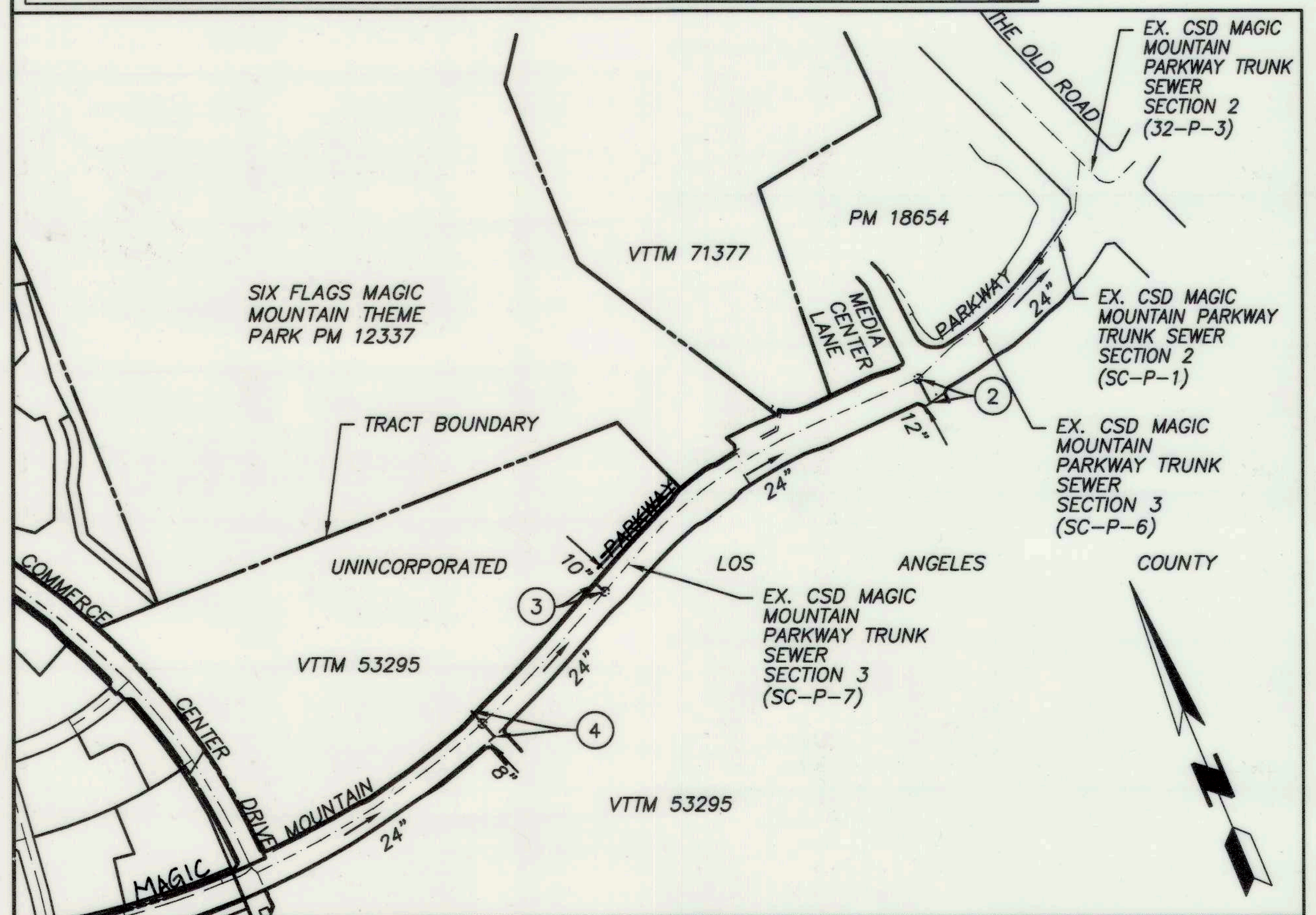
NEWHALL QUAD (2009) NAVD 88

BENCH MARK: LACDPW L 5402
RND HD SPK IN LOWER OF TWO CONC HDWLS @ N END 24' W/O C/L THE OLD RD (W RDWY) & 0.6MI S/O HENRY MAYO DR @ MI MKR #6.25

ELEV. 1031.831 FEET **ADJUSTMENT** 2009

SURVEYOR'S NOTE: TOPO & DESIGN ELEV ARE BASED ON 1995 ADJUSTMENT. TO ACQUIRE 2009 ADJUSTMENT ELEV, SUBTRACT 0.120 FT FROM ALL ELEVATIONS DEPICTED ON THESE PLANS.

Per Title 20.24.140 of LA County Code, obstructing access to sewer facilities is prohibited. No object difficult to remove shall be located over the sewer easement(s) as to interfere with ready access to sewer facilities.



INDEX MAP

SCALE: 1"=600'

BUILDING AND SAFETY DISTRICT OFFICE: SANTA CLARITA
NOTES: NUMBER IN CIRCLE INDICATES PAGE NUMBER.

CSMC INDEX: N-1218, N-1218, N-1256, N-1257
P.C. NO. 12220E TRACT NO. 61105-01
THOMAS GUIDE PAGE: 4550 B3, B4

NO.	REVISION	REVISED BY	APPROVED BY	DATE

DIGALERT
DIAL TOLL FREE
1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

STORMWATER POLLUTION PLAN NOTES

A.NOTES:

1. Every effort should be made to eliminate the discharge of non-stormwater from the project site at all times.
2. Eroded sediments and other pollutants must be retained on-site and may not be transported from the site via sheet flow, swales, area drains, natural drainage courses or wind.
3. Stockpiles of earth and other construction related materials must be protected from being transported from the site by the forces of wind or water.
4. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil and surface waters. All approved storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
5. Excess or waste concrete may not be washed into the public way or any other drainage system. Provisions shall be made to retain concrete wastes on-site until they can be disposed of as solid waste.
6. Trash and construction related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
7. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
8. Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.
9. The following BMPs as outlined in, but not limited to, the latest edition of the California BMP Handbook (Construction) or Caltrans Stormwater Quality Handbooks (Construction Site BMP Manual), may apply during the construction of this project (additional measures may be required if deemed appropriate by the Project Engineer or the Building Official)

EROSION CONTROL
EC1 SCHEDULING
EC2 PRESERVATION OF EXISTING VEGETATION
EC3 HYDRAULIC MULCH
EC4 HYDROSEEDING
EC5 SOIL BINDERS
EC6 STRAW MULCH
EC7 GEOTEXTILES & MATS
EC8 WOOD MULCHING
EC9 EARTH DIKES AND DRAINAGE SWALES
EC10 VELOCITY DISSIPATION DEVICES
EC11 SLOPE DRAINS
EC12 STREAMBANK STABILIZATION
EC13 RESERVED
EC14 COMPOST BLANKETS
EC15 SOIL PREPARATION/ROUGHENING
EC16 NON-VEGETATED STABILIZATION

WIND EROSION CONTROL
WE1 WIND EROSION CONTROL

EQUIPMENT TRACKING CONTROL
TC1 STABILIZED CONSTRUCTION ENTRANCE EXIT
TC2 STABILIZED CONSTRUCTION ROADWAY
TC3 ENTRANCE/OUTLET TIRE WASH

NON-STORM WATER MANAGEMENT
NS1 WATER CONSERVATION PRACTICES
NS2 DEWATERING OPERATIONS
NS3 PAVING AND GRINDING OPERATIONS
NS4 TEMPORARY STREAM CROSSING
NS5 CLEAR WATER DIVERSION
NS6 ILLICIT CONNECTION/DISCHARGE
NS7 POTABLE WATER/IRRIGATION
NS8 VEHICLE AND EQUIPMENT CLEANING
NS9 VEHICLE AND EQUIPMENT FUELING
NS10 VEHICLE AND EQUIPMENT MAINTENANCE
NS11 PILE DRIVING OPERATIONS
NS12 CONCRETE CURING
NS13 CONCRETE FINISHING
NS14 MATERIAL AND EQUIPMENT USE
NS15 DEMOLITION ADJACENT TO WATER
NS16 TEMPORARY BATCH PLANTS

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL
WM1 MATERIAL DELIVERY AND STORAGE
WM2 MATERIAL USE
WM3 STOCKPILE MANAGEMENT
WM4 SPILL PREVENTION AND CONTROL
WM5 SOLID WASTE MANAGEMENT
WM6 HAZARDOUS WASTE MANAGEMENT
WM7 CONTAMINATED SOIL MANAGEMENT
WM8 CONCRETE WASTE MANAGEMENT
WM9 SANITARY/SEPTIC WASTE MANAGEMENT
WM10 LIQUID WASTE MANAGEMENT

TEMPORARY SEDIMENT CONTROL
SE1 SILT FENCE
SE2 SEDIMENT BASIN
SE3 SEDIMENT TRAP
SE4 CHECK DAM
SE5 FIBER ROLLS
SE6 GRAVEL BAG BERM
SE7 STREET SWEEPING AND VACUUMING
SE8 SANDBAG BARRIER
SE9 STRAW BALE BARRIER
SE10 STORM DRAIN INLET PROTECTION
SE11 ACTIVE TREATMENT SYSTEMS
SE12 TEMPORARY SILT DIKE
SE13 COMPOST SOCKS & BERMS
SE14 BIOFILTER BAGS

B. STANDARD PLANS:

The following latest revised standard plans on file in the office of the following department shall apply in the construction of this project.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

2000-0	Legend for sanitary sewer plans and profiles and district maps.	2021-1	Bedding for sewer pipe.
2002-1	Precast concrete shallow manhole.	2023-2	Cradling and encasement.
2003-2	Reinforced precast concrete manhole.	2024-1	WYE or TEE support.
2004-1	Rectangular shallow manhole.	2026-1	Erosion protection in steep slopes.
2014-1	Rectangular manhole frame and cover.	2027-1	Allowable trench widths.
2015-1	Standard manhole step.	6008-1	Minimum public safety requirements.
		2100-1	Requirements for sanitary sewers near water mains

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION (SPPWC)

200-3	precast concrete sewer manhole	221-2	Pipe anchors and backfill stabilizers
207-2	Precast reinforced concrete manhole base	222-2	House connection sewer
208-2	Breaking into existing manholes	223-2	House connection remodeling
210-3	Manhole frame and cover locking type	225-2	Blanket protection for pipes
220-3	Chimneys		

NOTICE TO CONTRACTOR

Issue no house lateral connection permits until outlet sewer SC-p-6 & SC-p-7, are accepted for public use by the Los Angeles County Sanitation district.

The developer shall be responsible for the continued maintenance of PC 12220E sanitary sewer until the County formally accepts it for maintenance, all mainline, manholes and laterals shall be protected from damage and infiltration.

Maintain sewer flow at all times during construction.

Sewer video of all segments shall be submitted prior to partial field acceptance (95%) and completed field acceptance (98%). Final map and as built sewer plans shall be submitted prior to partial field acceptance.

All sanitary sewer manhole shafts and frames shall be watertight.

All proposed utilities shown on this plan, except for sanitary sewer, are to be constructed per separate plan and permit.

All sanitary sewer manhole shafts and frames shall be watertight with Butyl Rubber Mastic joint sealing compound or approved equal by the LA County Public Works.

NOTES:
Any damage to the sewer line shall be the responsibility of the contractor/owner. All grading and construction occurring over and the vicinity of the existing sewer shall be performed in the presence of a County inspector. Where applicable, the sewers shall be protected per Std. Plan 2023-2 at all significant crossings.

COUNTY SANITATION DISTRICT (CSD) NOTES:

1. No connection for the disposal of industrial wastes shall be made to sewers shown on these drawings until a permit for industrial waste water discharge has been issued by the County Sanitation Districts for said connections.
2. At least three (3) working days prior to breaking into or connecting to County Sanitation Districts' sewer or manhole and prior to final acceptance of the project, a County Sanitation Districts' inspector shall be notified by telephone at (661) 257-4809 so that required inspection can be made.
3. All work involving CSD sewer or manholes shall be in accordance with the latest edition of the Standard Specifications for Public Works Construction, and CSD's latest Amendments to the Standard Specifications for Public Works Construction and Standard Drawings for Construction. A copy of the Amendments and Standard Drawings may be obtained at the Public Counter (Room 110) located at CSD's Joint Administration Office, 1955 Workman Mill Road, Whittier, Ca 90601.
4. The County Sanitation Districts is a public agency comprised of more than 20 separate sanitation districts serving LA County, including the Santa Clarita Valley Sanitation District (SCVSD) and the Newhall Ranch Sanitation District (NRSD). CSD has one staff serving all its sanitation districts with headquarters in Whittier.
5. Protect existing concrete manhole shaft when necessary. Backfill around CSD manhole using 1.5 sack slurry. Send MH Shoring (when applicable) and 1.5 sack slurry mix (having 141 pounds of cement per cubic yard of slurry) to the CSD Sewer Design Section for approval prior to the start of the construction. Allow 3 weeks for review of each submittal.
6. Perform video inspection of the completed connection inside the manhole (when applicable) and provide video to CSD inspector to confirm satisfactory completion of the work.
7. CSD is not responsible for any personal injury or property damage relating to the work on these sewer plans. The project owner shall indemnify and hold harmless CSD from any claims, damage or losses relating to the work on these.

PRIVATE CONTRACT SEWER GENERAL NOTES

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the County of Los Angeles Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 3rd Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as road excavation, Caltrans, etc., must be filed with the permit application.
2. When work is within a contract city, a sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the City. The contractor must contact the Director of Public Works of that City to determine the location to pay the inspection fees.
3. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate or Worker's Compensation Insurance with the Department of Public Works as the Certificate Holder or both as applicable. The County of Los Angeles Department of Public Works shall be notified 30 days prior to cancellation of the insurance policy.
4. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles Department of Public Works does not constitute a representation as to accuracy of the location of or the existence or nonexistence of any underground utility pipe or structure within the limits of this project. This note applied to all pages.
7. All work shall be in accordance with the latest approved edition of the "Standard Specification for Public Works Construction" including supplements (if there is any), the latest "Additions and Amendments to the Standard Specifications for Public Works Construction," and the latest "Special Provisions for the Construction for Sanitary Sewer" and shall be approved by the County of Los Angeles Department of Public Works.
8. The contractor's attention is direct to Section 7-10.4.2 of the "Standard Specifications for Public Works Construction" in regard to safety orders and shall conform to the "Minimum Public Safety Requirement" as shown on County of Los Angeles Department of Public Works Standard Plan No. 6008-1.
9. Elevations are in feet above U.S.C. and G.S. sea level datum of 1988.
10. No revisions shall be made in these plans without the approval of the County of Los Angeles Department of Public Works.
11. No representative of the County of Los Angeles Department of Public Works will survey or layout any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade point for top of curbs, centerline of streets, or centerline of alleys, is shown by circles on profiles at all points between said designed points. The grade shall be established so as to conform to a straight line drawn between said design points.
13. The private engineer shall furnish the County of Los Angeles Department of Public Work with grade sheets and stationing for all house laterals and "Y" and "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.
15. An approved backwater valve is required when the pad is lower in elevation than the top of the next upstream manhole.
16. Contact Environmental Programs Division for an Industrial Waste Discharge Permit at (626) 458-3517.
17. When work is encroaching into Flood Control District easement and/or crossing its facilities, a Flood Control permit shall be obtained from the Los Angeles County Flood Control District at https://epicla.lacounty.gov at least 4 weeks prior to your desired start-up date. If you need additional information, you may contact Land Development Division - Permits Section Public Counter at (626) 458-4921.

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole.
2. Vitrified clay pipe joints shall be type "D" or "G" per "Standard Specifications for Public Works Construction" Section 208-2.
3. If a power pole is within three feet of the sewer, the sewer shall be encased, per LACDPW Standard Plan 2023-2, Case II, two feet on each side from the point of interference.
4. All joints between cast-iron pipe and vitrified clay shall be made with a rubber sleeve joint, type "D" (with bushing if necessary), per "Standard Specifications for Public Works Construction" Section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer, which is not indicated on the plans, the pipes shall be encased per LACDPW Standard Plan 2023-2, Case II, unless otherwise approved by the County of Los Angeles Department of Public Works.
8. All structures shall be either brick sewer manholes per LACDPW Standard Plan S-3 (SPPWC 203-2), or precast concrete sewer manholes per LACDPW Standard Plan S-36 (SPPWC 200-3), or reinforced precast manhole per LACDPW Standard Plan 2003-2, except as noted.
9. Resurface all trenches within paved areas to meet Department of Public Work or California State Highway requirements in accordance with the permits.
10. Full compliance with Section 306-12 of the "Standard Specifications for Public Works Construction" will be required for backfill in street. Certification of backfill, compaction, and sand equivalents by a qualified Civil Engineer shall be provided by the permittee prior to the issuance of a Certificate of Partial Acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90 percent of the maximum density as determined by ASTM Soil Compaction Test D 1557-78, Method "D", unless otherwise specified. This shall be certified by a qualified Civil Engineer. This certification shall be submitted to the Land development Division, Permit Section of the County of Los Angeles Department of Public Works prior to the acceptance of the work by the County.
12. Manhole tops in unimproved rights of way to be six inches above finished grade.
13. Sewers to be tested for leakage per Section 306-7.8 of the "Standard Specification for Public Works Construction" and "Special Provisions for the Construction of Sanitary Sewer" if applicable.
14. Manhole tops in improved rights of way to be level with finished grade.
15. All wyes and/or house laterals are to be located at least 5 feet apart, and when possible, not closer than 5 feet to any manhole.
16. All pipe materials shall be vitrified clay pipe or ductile iron pipe or other approved materials by the County of Los Angeles Department of Public Works.
17. All Ductile iron pipes shall be lined with Protecto 401 Ceramic Epoxy lining.
18. Cured in place pipe liner shall be used for all extra vitrified clay pipe if lining is required.
19. All chimneys shall have terminal cleanout structure per SPPWC std. plan 204-2 with traffic rated frame and cover.

BASIS OF BEARING

THE BEARINGS SHOWN HEREON ARE BASED ON THE BEARING S55-59-46W OF THE SOUTHEASTERLY LINE OF PARCEL MAP NO. 24500-01 FILED IN BOOK 293 PAGES 34 THROUGH 67, INCLUSIVE, OF PARCEL MAPS, RECORDS OF LOS ANGELES COUNTY.

PROFILE, ALIGNMENT, AND GRADE OF **PAGE 1**

SANITARY SEWERS

TO BE CONSTRUCTED IN

TRACT NO. 61105-01 PC NO. 12220E

2 SHEETS: 4 PAGES

COUNTY OF LOS ANGELES CALIFORNIA

CSMD INDEX: N-1256

MARK PESTRELLA LA COUNTY DIRECTOR OF PUBLIC WORKS
APPROVED BY LAND DEVELOPMENT DIVISION
BY [signature] 8/1/18
ASSISTANT DIVISION ENGINEER DATE
SUBMITTED BY [signature] 7/31/18
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

SANTA CLARITA VALLEY SANITATION DISTRICT
OF LOS ANGELES COUNTY, CALIFORNIA
GRACE ROBINSON HYDE - CHIEF ENGINEER and GENERAL MANAGER
APPROVED BY [signature] DATE: 8/8/18
OFFICE ENGINEER

Engineer's/Surveyor's Statement Regarding the Presence of Monuments within project limits.

I hereby attest that I have located and referenced on these plans the monuments existing prior to construction to ensure perpetuation of their location in accordance with section 8771 of the business and professions code. I further attest that I have performed a record search and field inspection to identify existing monuments; shall set sufficient controlling, witness, and permanent monuments; and shall file requisite corner record or record of survey of the references with the County surveyor.

[signature] 8/02/2018
Engineer/Surveyor Seal and Signature PL57295 DATE

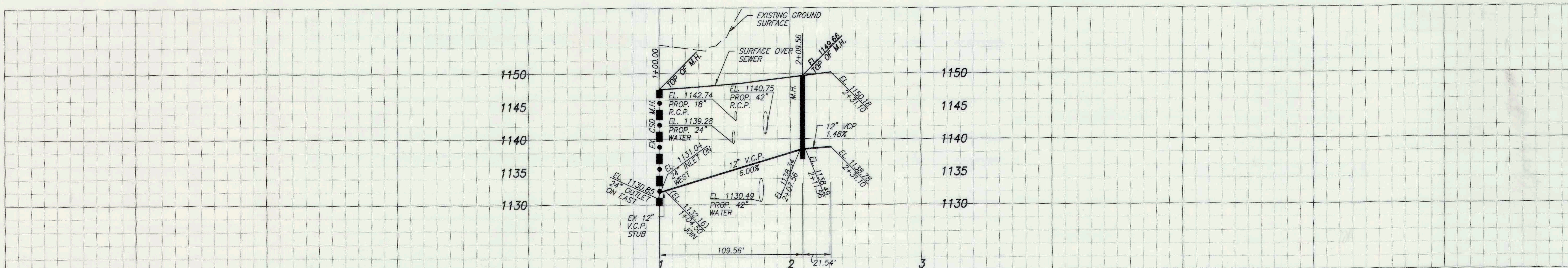
PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

[signature] 7-18-18
JASON H. FUKUMITSU RCE NO 40695 DATE

TRACT NO. 61105 PC 12220E

P.C. 12220E PAGE 2

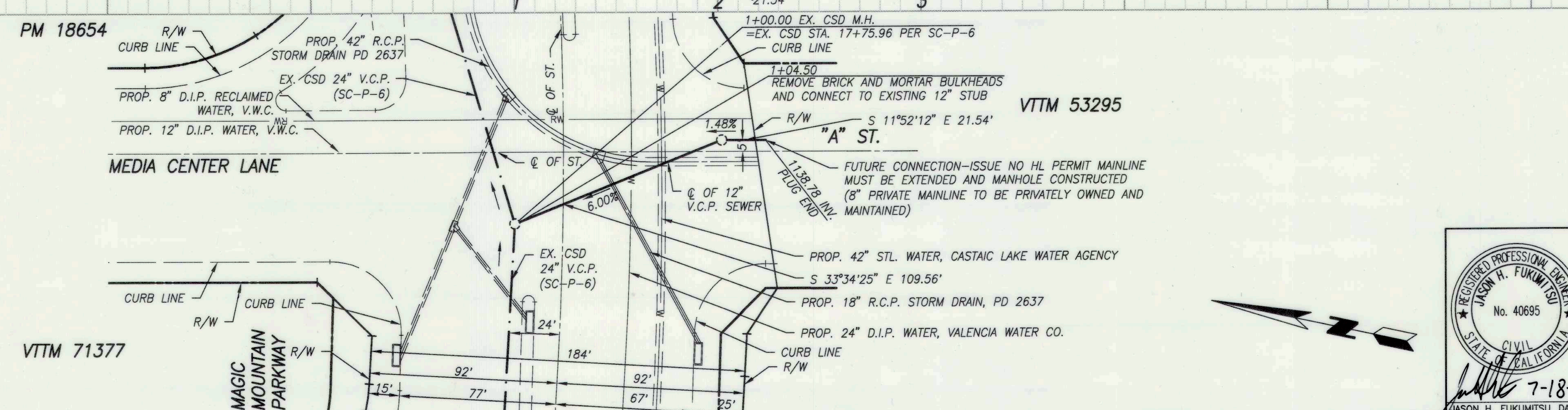


NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES
TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE



PLAN
SCALE: 1" = 40'
25 0 50 100

SANITARY SEWER PLANS IN
TRACT NO. 61105-01 PC NO. 12220E

REVIEWED BY LAND DEVELOPMENT DIVISION
BY [signature] 7/30/18
FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER
JASON H. FUKUMITSU
No. 40695
CIVIL
STATE OF CALIFORNIA

[signature] 7-18-18
JASON H. FUKUMITSU DATE

HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
26074 Avenue Hall, Suite #23 ▪ Valencia, CA 91355 ▪ PH: (661) 294-2211 ▪ FX: (661) 294-9890

DWG

G:\Newhall Ranch\61105 Mission Village\61105-01\Sewer\HMV199-01 PH1 SS PC 12220E MMP Entrada Stubs Title.dwg Plotted On Jul 18, 2018-11:06am by joshuay

P.C. 12220E PAGE 3

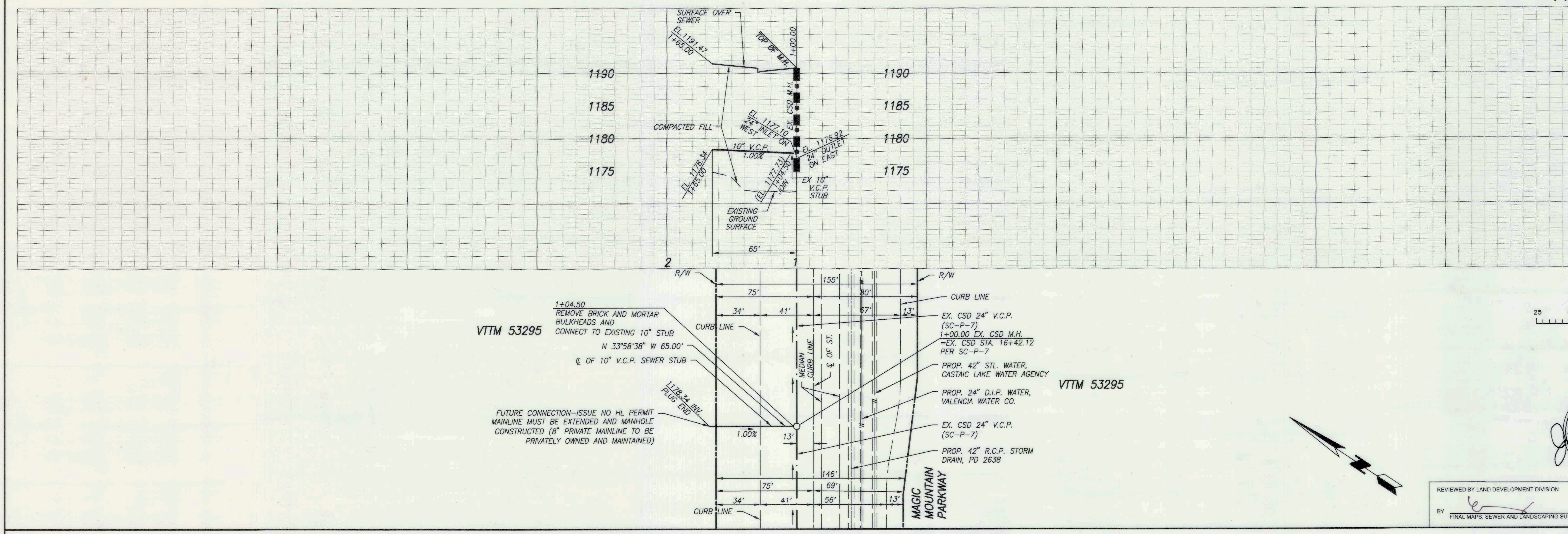
NO LA COUNTY CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 908-4288 EX. 2301

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

DOUBLE SCALE



PLAN

SCALE: 1" = 40'

25 0 50 100

REGISTERED PROFESSIONAL ENGINEER No. 40695 CIVIL STATE OF CALIFORNIA

7-18-18

REVIEWED BY LAND DEVELOPMENT DIVISION

BY

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE 7/30/18

P.C. 12220E PAGE 4

NO LA COUNTY CHARGES FOR CONNECTION

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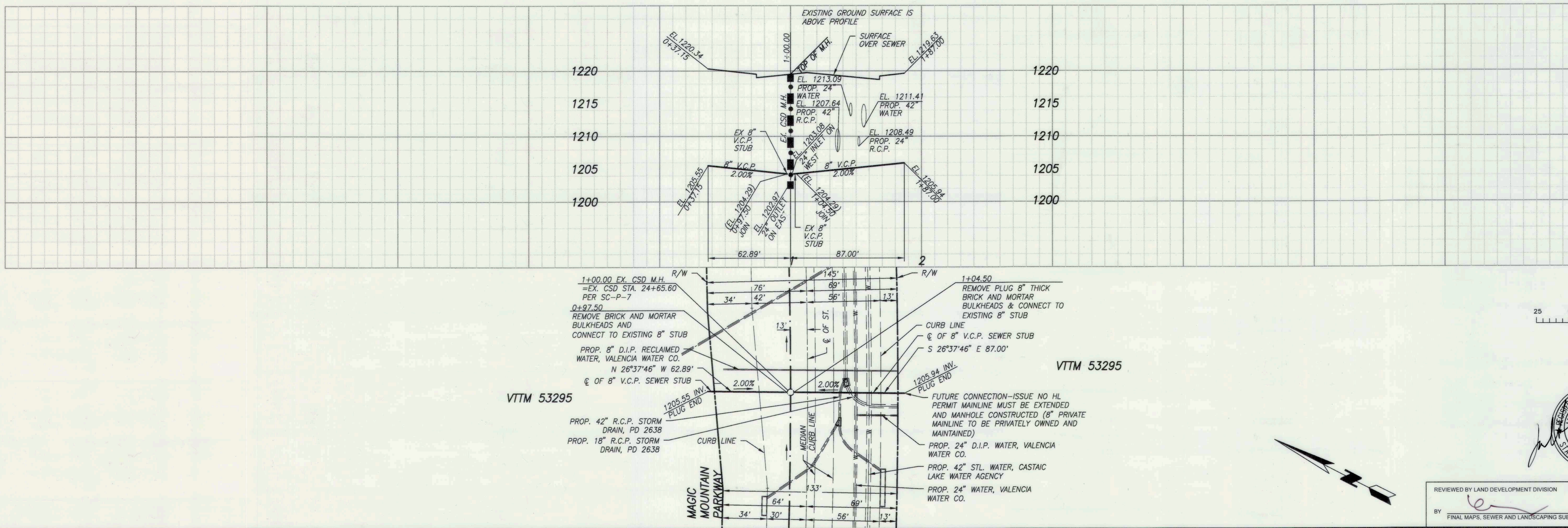
SCALE: VERT. 1" = 8' HORIZ. 1" = 40'

DOUBLE SCALE



PLAN

SCALE: 1" = 40'

25 0 50 100

REGISTERED PROFESSIONAL ENGINEER No. 40695 CIVIL STATE OF CALIFORNIA

7-18-18

REVIEWED BY LAND DEVELOPMENT DIVISION

BY

FINAL MAPS, SEWER AND LANDSCAPING SUBDIVISION PLAN CHECKING SECTION DATE 7/30/18

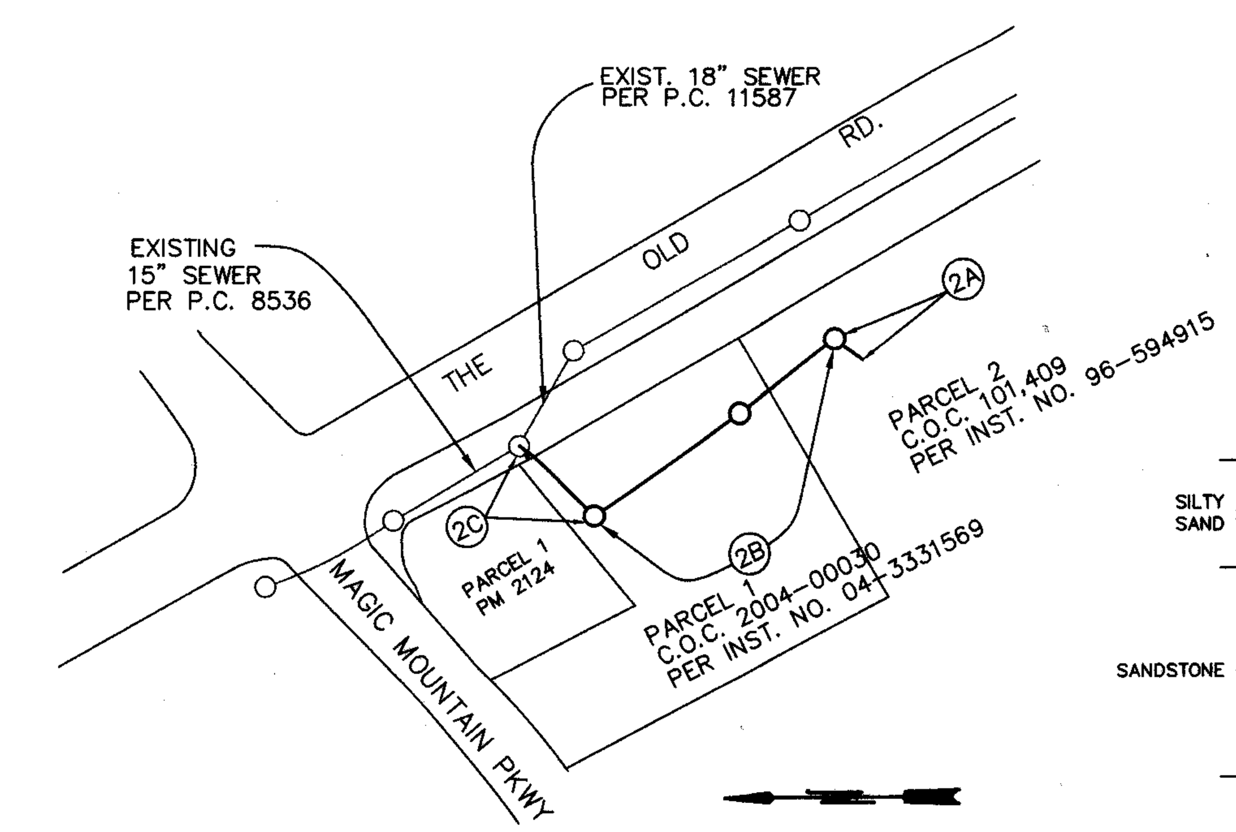
TRACT NO. 61105 PC 12220E

G:\Newhall Ranch\61105 Mission Village\61105-01\Sewer\MV199-02 PH1 SS PC 12220E MMP Entrada Stubs.dwg Plotted On Jul 18, 2018-11:20am by joshuay

BENCH MARK

BM L.A. COUNTY B.M. 5402 Elev. 1031.950
RND. HD SPK. TOP OF LOWEST HDWL 24 FT W/O C/L THE OLD ROAD (W. RDWY) & 0.6 MI S/O HENRY MAYO DR.

NEWHALL QUAD 1995



INDEX MAP - 1256

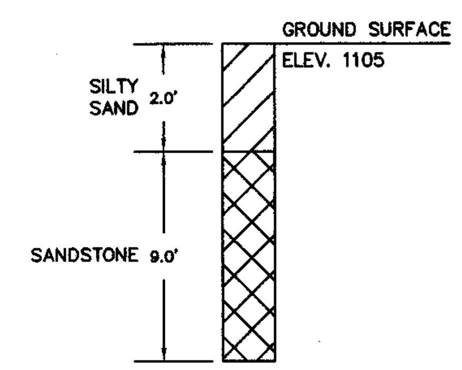
SCALE: 1"=200'

P.C. 11839 - SEWER WITHIN THE OLD ROAD

NOTE: NUMBERS IN CIRCLES INDICATE PAGE NUMBER.

THOMAS GUIDE PAGE: 4550-C2

BSD DISTRICT SANTA CLARITA



TEST PIT DATA

NOTE: PER PROJECT SOILS REPORT, GROUNDWATER LEVEL IS MORE THAN 50' BELOW FINISHED SURFACE.

NO.	REVISION	REVISED BY	APPROVED BY	DATE
1	LOWERED SEWER MAIN BY 1.50' DUE TO LOWERING OF RCB PER MTD 1764. ADDED ENCASEMENT DETAIL.	RCE 51929	T. Khalil	4/6/06

STORMWATER POLLUTION CONTROL REQUIREMENTS FOR SEWER CONSTRUCTION

A. NOTES

1. Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheet flow, swales, area drains, natural drainage courses, or wind.
2. Stockpiles of earth and other construction related materials must be protected from being transported from the site by the forces of wind or water.
3. Fuels, oils, solvents, and other toxic materials must be stored in accordance with their listing and are not to contaminate the soil and surface waters. All approved storage containers are to be protected from the weather. Spills must be cleaned up immediately and disposed of in a proper manner. Spills may not be washed into the drainage system.
4. Excess or waste concrete may not be washed into the public way or any other drainage system. Provisions shall be made to retain concrete wastes on site until they can be disposed of as solid waste.
5. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
6. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
7. Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.
8. The following BMP's as outlined in, but not limited to, the Best Management Practice Handbook, California Stormwater Quality Task Force, Sacramento, California 2003, or the latest revised edition, may apply during construction of this project(additional measure may be required if deemed appropriate by the county inspectors):

TEMPORARY SOIL STABILIZATION

SS1 - SCHEDULING
SS2 - PRESERVATION OF EXISTING VEGETATION
SS3 - HYDRAULIC MULCH
SS4 - HYDROSEEDING
SS5 - SOIL BINDERS
SS6 - STRAW MULCH
SS7 - GEOTEXTILES, PLASTIC COVERS, & EROSION CONTROL BLANKETS/MATS
SS8 - WOOD MULCHING
SS9 - EARTH DIKES/DRAINAGE SWALES & LINED DITCHES
SS10 - OUTLET PROTECTION/VELOCITY DISSIPATION DEVICES
SS11 - SLOPE DRAINS
SS12 - STREAMBANK STABILIZATION

WIND EROSION CONTROL

WE1 - WIND EROSION CONTROL

TRACKING CONTROL

TC1 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
TC2 - STABILIZED CONSTRUCTION ROADWAY
TC3 - ENTRANCE/OUTLET TIRE WASH

TEMPORARY SEDIMENT CONTROL

SCI - SILT FENCE
SC2 - SEDIMENT/DESILTING BASIN
SC3 - SEDIMENT TRAP
SC4 - CHECK DAM
SC5 - FIBER ROLLS
SC6 - GRAVEL BAG BERM
SC7 - STREET SWEEPING AND VACUUMING
SC8 - SANDBAG BARRIER
SC9 - STRAW BALE BARRIER
SC10 - STORM DRAIN INLET PROTECTION

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL

WM1 - MATERIAL DELIVERY AND STORAGE
WM2 - MATERIAL USE
WM3 - STOCKPILE MANAGEMENT
WM4 - SPILL PREVENTION AND CONTROL
WM5 - SOLID WASTE MANAGEMENT
WM6 - HAZARDOUS WASTE MANAGEMENT
WM7 - CONTAMINATED SOIL MANAGEMENT
WM8 - CONCRETE WASTE MANAGEMENT
WM9 - SANITARY/SEPTIC WASTE MANAGEMENT
WM10 - LIQUID WASTE MANAGEMENT

NON-STORMWATER MANAGEMENT

NS1 - WATER CONSERVATION PRACTICES
NS2 - DEWATERING OPERATIONS
NS3 - PAVING AND GRINDING OPERATIONS
NS4 - TEMPORARY STREAM CROSSING
NS5 - CLEAR WATER DIVERSION
NS6 - ILLICIT CONNECTION/ILLEGAL DISCHARGE DETECTION AND REPORTING
NS7 - POTABLE WATER/IRRIGATION
NS8 - VEHICLE AND EQUIPMENT CLEANING
NS9 - VEHICLE AND EQUIPMENT FUELING
NS10 - VEHICLE AND EQUIPMENT MAINTENANCE
NS11 - PILE DRIVING OPERATIONS
NS12 - CONCRETE CURING
NS13 - MATERIAL AND EQUIPMENT USE OVER WATER
NS14 - CONCRETE FINISHING
NS15 - STRUCTURE DEMOLITION/REMOVAL OVER OR ADJACENT TO WATER

STANDARD PLANS:

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE FOLLOWING DEPARTMENT SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

APWA 208-1	BREAKING INTO EXISTING MANHOLES	2000-0	LEGEND FOR SANITARY SEWER PLANS AND PROFILES AND DISTRICT MAPS.
APWA 220-2	CHIMNEYS		
APWA 222-0	HOUSE CONNECTION SEWER	2021-0	BEDDING FOR SEWER PIPE
APWA 223-0	HOUSE CONNECTION REMODELING	2024-0	WYE OR TEE SUPPORT
		2027-0	ALLOWABLE TRENCH WIDTHS

EASEMENT TO THE COUNTY OF LOS ANGELES FOR SANITARY SEWER, INGRESS AND EGRESS
NOTE: TO BE GRANTED OVER ALL PRIVATE STREETS PER FINAL MAP.

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

PRIOR TO ACCEPTANCE FOR PUBLIC USE AND MAINTENANCE ALL SANITARY SEWER EASEMENTS SHALL BE RECORDED AND DEDICATED TO L.A. COUNTY.

MAINTAIN SEWER FLOW AT ALL TIME DURING CONSTRUCTION.

BEFORE BREAKING INTO OR CONSTRUCTING A SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (661) 266-4683 SO THAT REQUIRED INSPECTION CAN BE MADE.

* =ISSUE NO PERMITS, MAINLINE MUST BE EXTENDED AND M.H. CONSTRUCTED

PRIVATE CONTRACT SEWER GENERAL NOTES

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 8th Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as Road Excavation, Caltrans, etc., must be filed with the permit application.
2. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate of Worker's Compensation Insurance with the Department of Public Works named as the Certificate Holder to be notified 30 days prior to cancellation of policy.
3. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
4. When work is within a contract city, the contractor must contact the Director of Public Works of that city, to determine the location to pay the inspection fee.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles does not constitute a representation as to accuracy of the location of or the existence or non-existence of any underground utility pipe or structure within the limits of this project. This note applies to all pages.
7. All work shall be in accordance with the latest approved edition of the "Standard Specifications for Public Works Construction, including supplements and the latest Special Provisions for the Construction of Sanitary Sewers and shall be prosecuted only in the presence of the Department of Public Works
8. The contractor's attention is directed to Section 7-10.4.1 of the Standard Specifications for Public Works Construction in regard to safety orders and shall conform to the "Minimum Public Safety Requirements" as shown on Los Angeles Department of Public Works' Standard Plan 6008-1.
9. Elevations are in feet above U.S.C. & G.S. sea level datum of 1929.
10. No revisions shall be made in these plans without the approval of the Director of Public Works.
11. No representative of the Department of Public Works will survey or lay out any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade points for top of curbs, centerline of streets, or centerline of alleys, are shown by circles on profiles at all points between said designated points. The grade shall be established so as to conform to a straight line drawn between said design points.
13. The private engineer shall furnish the Department of Public Works with grade sheets and stationing for all house laterals and "Y" or "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.
15. An approved backwater valve is required when pad is lower in elevation than the top of the next upstream manhole.

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole
2. Vitrified clay pipe joints shall be type "D" or "G" per "Standard Specifications for Public Works Construction" section 208-2.
3. If a powerpole is within three feet of the sewer, the sewer shall be encased per LACDPW standard plan 2023-2, case II, two feet on each side from the point of interference.
4. All joints between cast iron pipe and vitrified clay shall be made with a rubber sleeve joint, type "D" (with bushing if necessary) per "standard specifications for Public Works Construction" section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction, it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer which is not indicated on the plans, the pipes shall be encased per LACDPW standard plan 2023-2, case II, unless otherwise approved by the director of Public Works.
8. All structures shall be either brick sewer manholes per LACDPW standard plan S-3 (APWA 203-0), or precast concrete sewer manholes per LACDPW standard plan S-36 (APWA 200-2), or reinforced precast concrete manhole per LACDPW standard plan 2003-2, except as noted.
9. Resurface all trenches within paved areas to meet Department of Public Works or California State Highway requirements in accordance with the permits.
10. Full compliance with section 306-1.3.4. of the "Standard Specification for Public Works Construction" will be required for backfill in street. Certification of backfill, compaction, and sand equivalents by a qualified civil engineer shall be provided by the permitee prior to the issuance of a certificate of partial acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90% of the maximum density as determined by ASTM soil compaction test D 1557-78 method "D" unless otherwise specified. This shall be certified by a qualified civil engineer. This certification shall be submitted to the Construction Division of the Department of Public Works prior to the acceptance of the work by the county.
12. Manhole tops in unimproved rights of way to be six inches above finished grade.
13. Sewers to be tested for leakage per section 306-1.4 of the "Standard Specifications for Public Works Construction" and "Special Provisions for the Construction of Sanitary Sewer".
14. Manhole tops in improved rights of way to be level with finished grade.
15. All wyes and/or house laterals are to be located at least 5' apart and when possible not closer than 5' to any manhole.

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN
PC NO. 11839

THE OLD ROAD 200' S/O MAGIC MOUNTAIN PKWY

1 SHEETS: 2 PAGES

COUNTY OF LOS ANGELES CALIFORNIA

INDEX-1256

DONALD L. WOLFE — DIRECTOR OF PUBLIC WORKS

APPROVED BY: LAND DEVELOPMENT DIVISION

BY — ASSISTANT DIVISION ENGINEER — 1/5/2006 — DATE

SUBMITTED BY — SUBDIVISION PLAN CHECKING SECTION — 1/5/2006 — DATE

APPROVED: COUNTY SANITATION DISTRICT OF LOS ANGELES CALIF.
JAMES F. STAHL - CHIEF ENGINEER and GENERAL MANAGER

COUNTY SANITATION DISTRICT NO. 32

BY — OFFICE ENGINEER — DATE: 1/10/06

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

RCE NO. 51929 — 12-16-05 — DATE

THE OLD ROAD, 200' S/O MAGIC MOUNTAIN PARKWAY — PC 11839 — 1

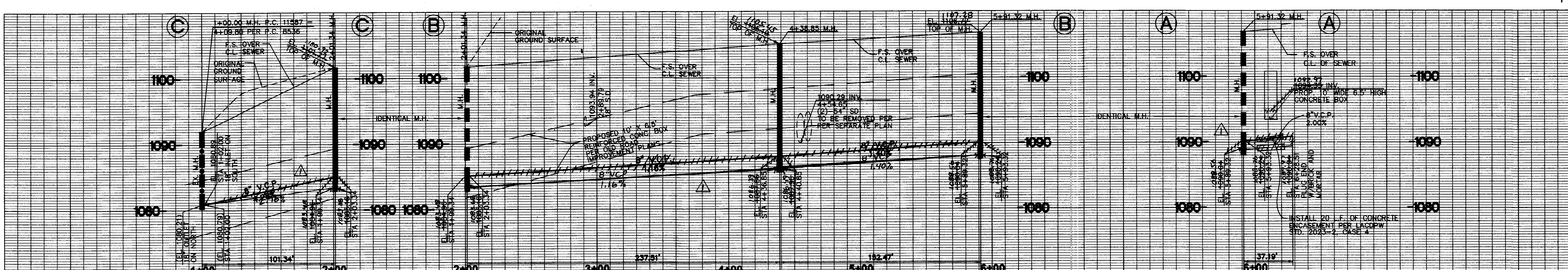
P.C. 11839 PAGE 2

NO. L.A. CO. CHARGES FOR CONNECTION

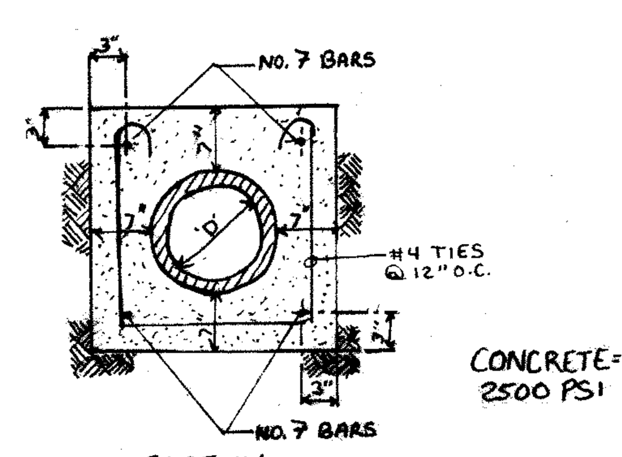
SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL (562) 699-7411 EX. 2727

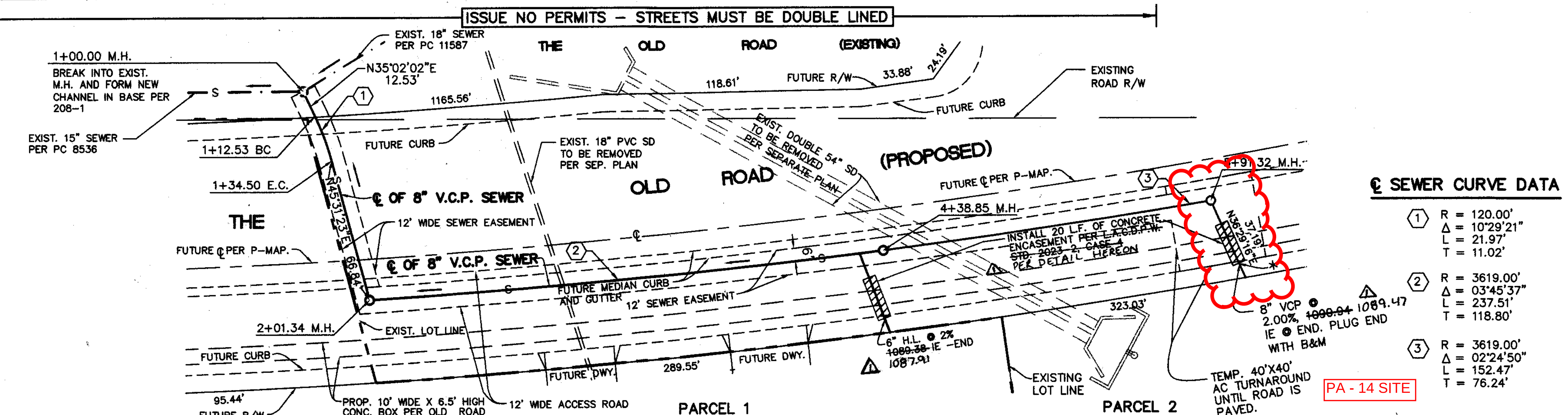
DOUBLE SCALE



ISSUE NO PERMITS - STREETS MUST BE DOUBLE LINED



SPECIAL ENCASEMENT DETAIL
EXTEND 3'-0" MIN. BEYOND BOX



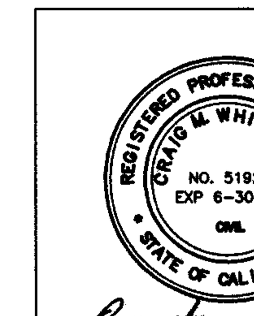
℄ SEWER CURVE DATA

1	R = 120.00'	Δ = 10°29'21"	L = 21.97'	T = 11.02'
2	R = 3619.00'	Δ = 03°45'37"	L = 237.51'	T = 118.80'
3	R = 3619.00'	Δ = 02°24'50"	L = 152.47'	T = 76.24'

PLAN
SCALE: 1" = 40'
25 0 50 100

SANITARY SEWER PLANS IN
THE OLD ROAD PC NO. 11839
200' S/O MAGIC MOUNTAIN PKWY

REVIEWED BY LAND DEVELOPMENT DIVISION
BY — SUBDIVISION PLAN CHECKING SECTION — 1/4/06 — DATE
COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS



PROJECT ENGINEER — 12-16-05 — DATE

ALLIANCE
LAND PLANNING & ENGINEERING INC.

5962 LAPLACE COURT
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896

I:\CAD\0257\SEWER\SEWER SHEET.dwg — JN 0257

BENCH MARK

BM L.A. COUNTY B.M. 5402 Elev. 1031.950
RND. HD SPK. TOP OF LOWEST HDWL 24 FT W/O C/L THE OLD ROAD (W. RDWY) & 0.6 MI S/O HENRY MAYO DR.

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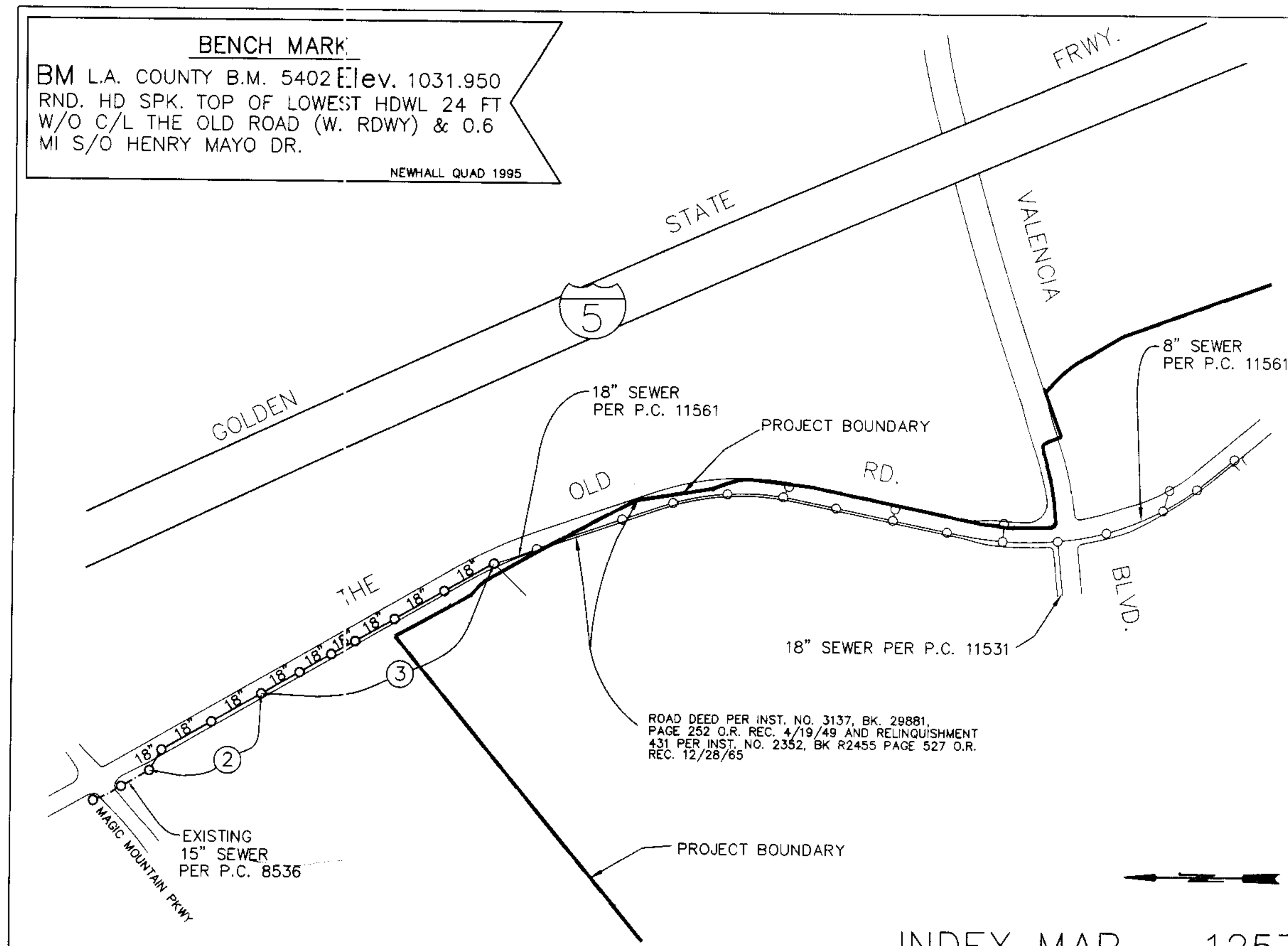

INDEX MAP – 1257

SCALE: 1"=600'

P.C. 11587 – SEWER WITHIN THE OLD ROAD

NOTE: NUMBERS IN CIRCLES INDICATE PAGE NUMBER.

THOMAS GUIDE PAGE: 4550-C4, D4

NO.	REVISION	REVISED BY	APPROVED BY	DATE

STORMWATER POLLUTION CONTROL REQUIREMENTS FOR SEWER CONSTRUCTION

DOUBLE SCALE

1. Eroded sediments and other pollutants must be retained on site and may not be transported from the site via sheet flow, swales, area drains, natural drainage courses, or wind.
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5. Trash and construction-related solid wastes must be deposited into a covered receptacle to prevent contamination of rainwater and dispersal by wind.
6. Sediments and other materials may not be tracked from the site by vehicle traffic. The construction entrance roadways must be stabilized so as to inhibit sediments from being deposited into the public way. Accidental depositions must be swept up immediately and may not be washed down by rain or other means.
7. Any slopes with disturbed soils or denuded of vegetation must be stabilized so as to inhibit erosion by wind and water.

CA001 – DEWATERING OPERATIONS
CA002 – PAVING OPERATIONS
CA003 – STRUCTURE CONSTRUCTION AND PAINTING
CA010 – MATERIAL DELIVERY AND STORAGE
CA020 – SOLID WASTE MANAGEMENT
CA021 – HAZARDOUS WASTE MANAGEMENT
CA023 – CONCRETE WASTE MANAGEMENT
CA024 – SANITARY/SEPTIC WASTE MANAGEMENT
CA030 – VEHICLE AND EQUIPMENT CLEANING
CA031 – VEHICLE AND EQUIPMENT FUELING
CA032 – VEHICLE AND EQUIPMENT MAINTENANCE
ESC01 – SCHEDULING
ESC02 – PRESERVATION OF EXISTING VEGETATION

ESC10 – SEEDING AND PLANTING
ESC11 – MULCHING
ESC20 – GEOTEXTILES AND MATS
ESC21 – DUST CONTROLS
ESC22 – TEMPORARY STREAM CROSSING
ESC23 – CONSTRUCTION ROAD STABILIZATION
ESC24 – STABILIZED CONSTRUCTION ENTRANCE
ESC54 – STORM DRAIN INLET PROTECTION

STANDARD PLANS:

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE FOLLOWING DEPARTMENT SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

APWA 208-0	BREAKING INTO EXISTING MANHOLES
APWA 220-2	CHIMNEYS
APWA 222-0	HOUSE CONNECTION SEWER
APWA 223-0	HOUSE CONNECTION REMODELING
2000-0	LEGEND FOR SANITARY SEWER PLANS AND PROFILES AND DISTRICT MAPS.
2021-0	BEDDING FOR SEWER PIPE
2024-0	WYE OR TEE SUPPORT
2027-0	ALLOWABLE TRENCH WIDTHS

NOTE: EASEMENT TO THE COUNTY OF LOS ANGELES FOR SANITARY SEWER, INGRESS AND EGRESS TO BE GRANTED OVER ALL PRIVATE STREETS PER FINAL MAP.

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DESTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (661) 266-4683 SO THAT REQUIRED INSPECTION CAN BE MADE.

PRIVATE CONTRACT SEWER GENERAL NOTES

1. A sewer construction permit shall be obtained and a fee paid for construction inspection and record plans to the Department of Public Works at the Permit Counter, 900 South Fremont Avenue, 8th Floor, Alhambra, at least 72 hours prior to starting work under this permit. Copies of all other required permits, such as Road Excavation, Caltrans, etc., must be filed with the permit application.
2. Prior to issuance of any permit, the contractor shall file a permit for excavations and trenches from the State of California Division of Industrial Safety, and a Certificate of Worker's Compensation Insurance with the Department of Public Works named as the Certificate Holder to be notified 30 days prior to cancellation of policy.
3. If work is done in a State Highway, a permit must be obtained from the State of California Division of Highways, 120 South Spring Street, Los Angeles, California.
4. When work is within a contract city, the contractor must contact the Director of Public Works of that city, to determine the location to pay the inspection fee.
5. The contractor shall contact the district office listed on the "Application for Construction Permit" to arrange for an acceptable construction start date.
6. Approval of this plan by the County of Los Angeles does not constitute a representation as to accuracy of the location of or the existence or non-existence of any underground utility pipe or structure within the limits of this project. This note applies to all pages.
7. All work shall be in accordance with the latest approved edition of the "Standard Specifications for Public Works Construction, including supplements and the latest Special Provisions for the Construction of Sanitary Sewers and shall be prosecuted only in the presence of the Department of Public Works
8. The contractor's attention is directed to Section 7-10.4.1 of the Standard Specifications for Public Works Construction in regard to safety orders and shall conform to the "Minimum Public Safety Requirements" as shown on Los Angeles Department of Public Works' Standard S-2.
9. Elevations are in feet above U.S.C. & G.S. sea level datum of 1929.
10. No revisions shall be made in these plans without the approval of the Director of Public Works.
11. No representative of the Department of Public Works will survey or lay out any portion of the work.
12. Grades to which this improvement is to be constructed are shown on plans and profiles. Grade points for top of curbs, centerline of streets, or centerline of alleys, are shown by circles on profiles at all points between designated points. The grade shall be established so as to conform to a straight line drawn between said designated points.
13. The private engineer shall furnish the Department of Public Works with grade sheets and stationing for all house laterals and "Y" or "T" branches and shall provide stakes for them at their proper locations with stationing plainly marked. All house laterals shall be constructed in a straight alignment at right angles from the main line sewer except as shown on the plans. House laterals from chimneys shall not have an angle of less than 45 degrees with the M.L. sewer. Any change in alignment shall be requested in writing by the private engineer.
14. The private engineer shall furnish the house lateral depth at the property line below the top of curb elevation for each house lateral on the grade sheet.

CONSTRUCTION NOTES

1. Provide survey stakes on the property line or property lines produced at right angles to the sewer line at the centerline of each manhole
2. Vitrified clay pipe joints shall be type "D" or "G" per standard specifications section 208-2.
3. If a powerpole is within three feet of the sewer, the sewer shall be encased per standard plan S-23, case II, two feet on each side from the point of interference.
4. All joints between cast iron pipe and vitrified caly shall be made with a rubber sleeve joint, type "D" (with bushing if necessary) per standard specifications section 208-2.
5. House laterals to be constructed with inverts at the property line 6 feet below curb grade except as noted.
6. Wye or tee branches may be used for connections to the mainline sewers except as noted.
7. If during the course of construction, it is determined that there is less than four feet of cover over the top of a mainline or house lateral V.C.P. sewer which is not indicated on the plans, the pipes shall be encased per standard plan S-23, case II, unless otherwise approved by the director of Public Works.
8. All structures shall be either brick sewer manholes per standard plan S-3 or precast concrete sewer manholes per standard plan S-36, or reinforced precast concrete manhole per standard plan S-6, except as noted.
9. Resurface all trenches within paved areas to meet Los Angeles County Public Works or California State Highway requirements in accordance with the permits.
10. Full compliance with section 306-1.3.4. of the standard specification will be required for backfill in street certification of backfill compaction and sand equivalents by a qualified civil engineer shall be provided by the permitee prior to the issuance of a certificate of partial acceptance.
11. All backfill and fills outside of the street right of way shall be compacted to 90% of the maximum density as determined by ASTM soil compaction test D 1557-78 method "D" unless otherwise specified. This shall be certified by a qualified civil engineer. This certification shall be submitted to the Construction Division of the Department of Public Works prior to the acceptance of the work by the county.
12. Manhole tops in improved rights of way to be level with finished grade.
13. Sewers to be tested for leakage per section 306-1/4 of the standard specifications and special provisions.

55416

PROFILE, ALIGNMENT AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN

THE OLD ROAD P.C. 11587
S./O. MAGIC MTN. PARKWAY & N./O. VALENCIA BLVD.

2 SHEETS: 3 PAGES

COUNTY OF LOS ANGELES CALIFORNIA

INDEX-1257

P.C. 11281 (1)

JAMES A. NOYES — DIRECTOR OF PUBLIC WORKS

RECOMMENDED LAND DEVELOPMENT DIVISION

BY [signature] ASSISTANT DIVISION ENGINEER — 6/20/01 DATE

SUBMITTED BY [signature] SUBDIVISION PLAN CHECKING SECTION — 6/26/01 DATE

APPROVED: COUNTY SANITATION DISTRICT OF LOS ANGELES CALIF.
JAMES F. STHAL – CHIEF ENGINEER and GENERAL MANAGER

COUNTY SANITATION DISTRICT NO. 32

BY [signature] OFFICE ENGINEER — DATE: 6-21-01

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

[signature] RCE NO. 51929 — 5-22-01 DATE

P.C. 11587 PAGE 2

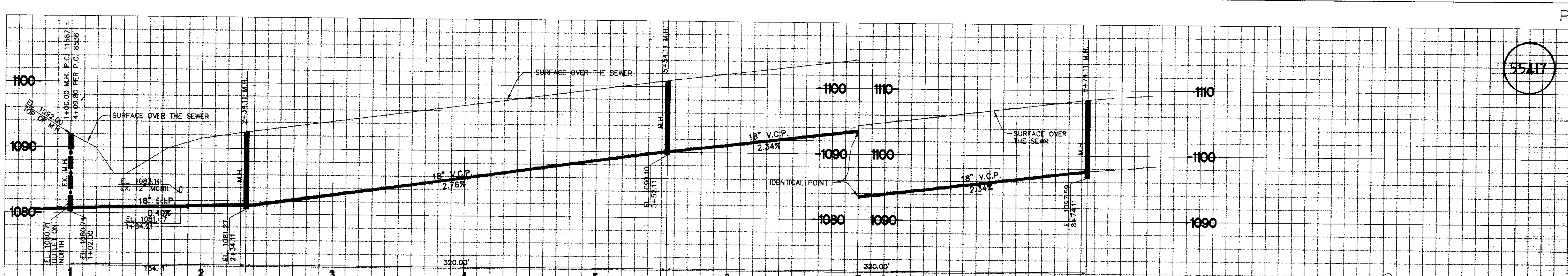
NO. L.A. CO. CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

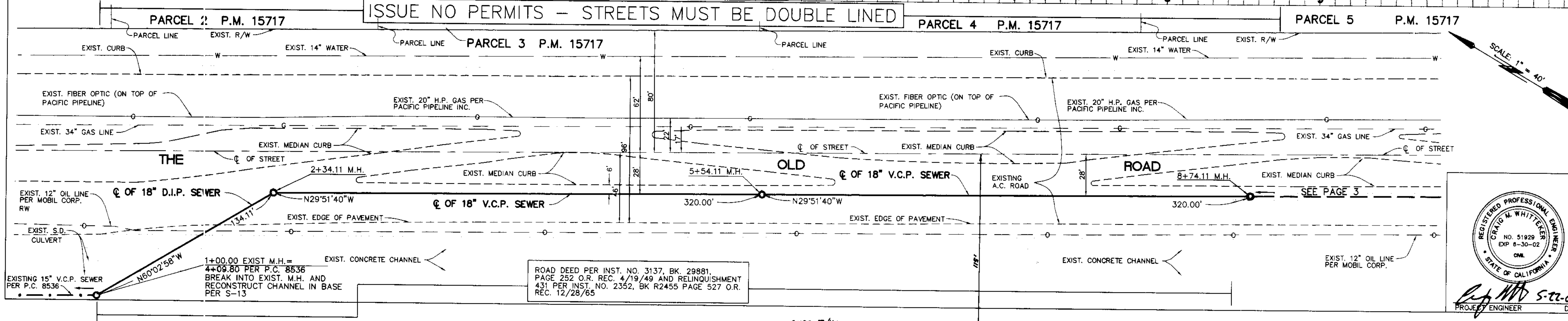
TEL. (562) 699-7411 EX. 2727

DOUBLE SCALE

55417



ISSUE NO PERMITS – STREETS MUST BE DOUBLE LINED



PLAN

SCALE: 1" = 40'

PS007252

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-02 CIVIL STATE OF CALIFORNIA

[signature] 5-22-01
PROJECT ENGINEER — DATE

SANITARY SEWER PLANS IN THE OLD ROAD
E./O. MAGIC MTS. PARKWAY & W./O. VALENCIA BLVD.

PC NO. 11587

REVIEWED LAND DEVELOPMENT DIVISION

BY M.D. [signature] SUBDIVISION PLAN CHECKING SECTION — 6-20-01 DATE

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

ALLIANCE LAND PLANNING & ENGINEERING INC.
5962 LAPLACE COURT
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896

93004\SEWER\P.C. 11587\PC11587-SHT12.DWG — JN 0031

P.C. 11587

P.C. 11587 PAGE 3

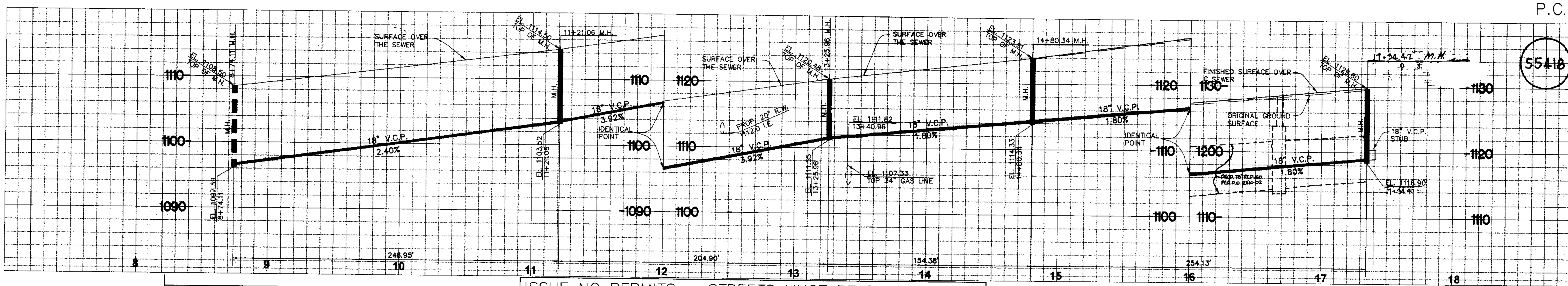
NO. L.A. CO. CHARGES FOR CONNECTION

55418

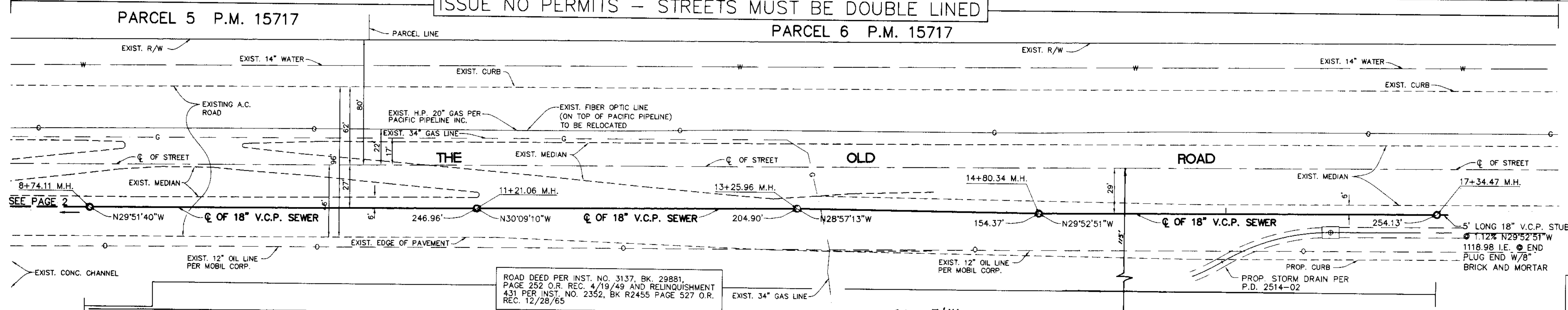
SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727

DOUBLE SCALE



ISSUE NO PERMITS – STREETS MUST BE DOUBLE LINED



REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-02 CIVIL STATE OF CALIFORNIA

PLAN
SCALE: 1" = 40'

REVIEWED BY LAND DEVELOPMENT DIVISION
BY M.D. E... 6-20-01
SUBDIVISION PLAN CHECKING SECTION DATE

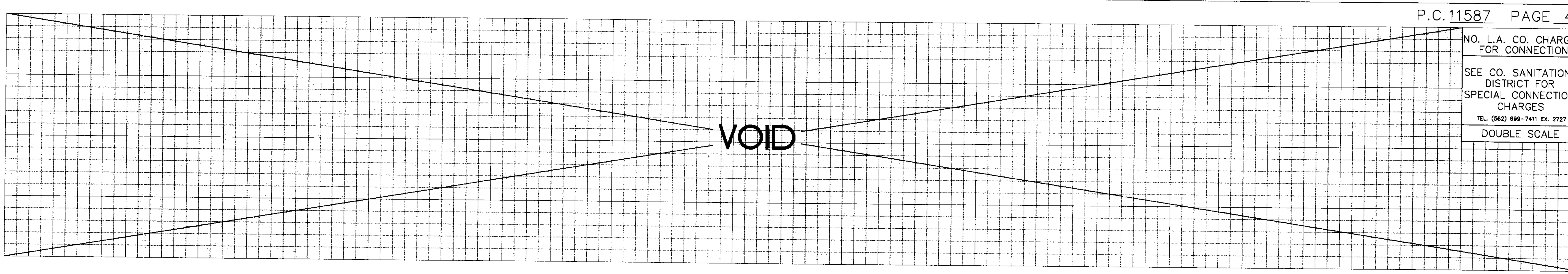
P.C. 11587 PAGE 4

NO. L.A. CO. CHARGES FOR CONNECTION

SEE CO. SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727

DOUBLE SCALE



REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-02 CIVIL STATE OF CALIFORNIA

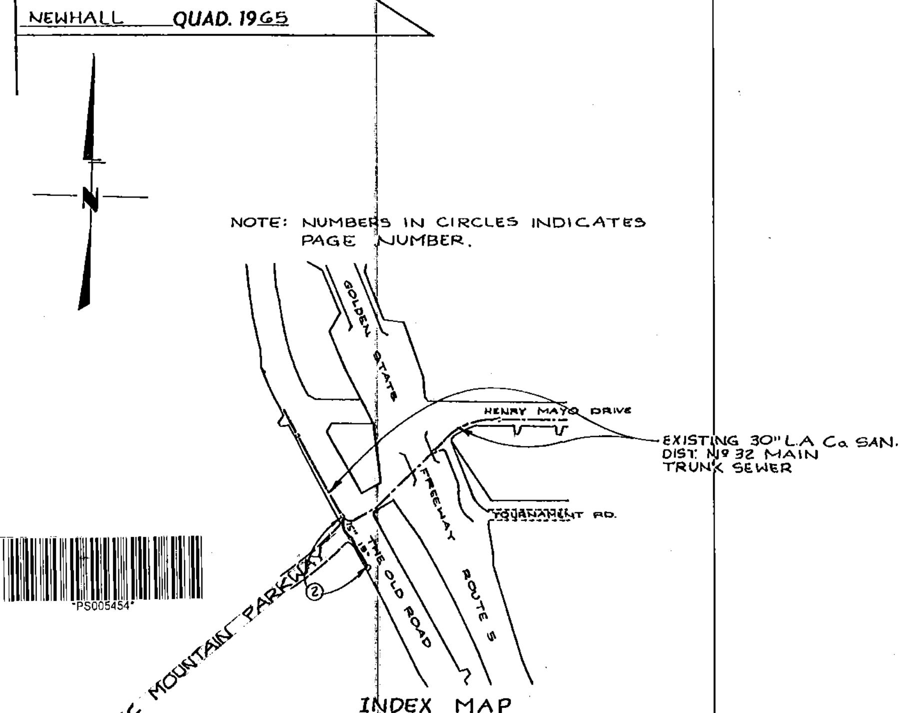
PS007252

PLAN
SCALE: 1" = 40'

REVIEWED BY LAND DEVELOPMENT DIVISION
BY
SUBDIVISION PLAN CHECKING SECTION DATE

JN 0031 93004\SEWER\P.C. 11587\PC11587-SHT34.DWG

B.M. BL 1774 ELEV. 1078.072
RDBM TAG 9CB TRAFFIC ISL. 18 FT N ℄ & S R/WY HENRY MAYO DR. +70 FT W ℄ GOLDEN ST. FWY BRIDGE B 53-1628
NEWHALL QUAD. 1965



INDEX MAP
SCALE 1" = 500'
PC 8536

NOTICE TO CONTRACTOR

The existence and location of any underground utility pipes or structures shown on these plans are obtained by a search of the available records. To the best of my knowledge there are no existing utilities except as shown on these plans. The contractor is required to take due precautionary measures to protect the utility lines shown and any other lines not of record or not shown on these plans.

Ronald R. Horn
R.C.E. 16913

COLLECT CHARGES AS INDICATED

DOUBLE SCALE
NEWHALL BLDG. DIST. NO. 8.2

NOTES:

1. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT PROPERTY LINE 0 FEET BELOW FINISHED GRADE.
2. PROVIDE STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTER LINE OF EACH MANHOLE.
3. NO REPRESENTATIVE OF THE COUNTY ENGINEER WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
4. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY ENGINEER WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45° WITH THE MAIN LINE SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
5. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE FINISHED GRADE FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
6. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY ENGINEER.
7. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION DIVISION BY TELEPHONE, MADISON 9-4747, EXT. 81551, AT LEAST TWENTY-FOUR HOURS BEFORE STARTING ANY WORK UNDER THIS CONTRACT.
8. ALL STRUCTURES SHALL BE EITHER BRICK MANHOLES PER S-3 OR PRECAST CONCRETE MANHOLES PER S-36 .. EXCEPT AS NOTED.
9. "Y" OR "T" BRANCHES MAY BE USED FOR CONNECTIONS TO MAINLINE SEWERS EXCEPT AS NOTED.
10. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
11. USE EXTRA STRENGTH PIPE. ALL PIPE IS STANDARD DEPTH EXCEPT AS NOTED.
12. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D", "F", OR "G" PER STANDARD SPECIFICATIONS SECTION 208-2.
13. IF A POWER POLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED, PER S-23, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
14. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAIN LINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPE SHALL BE ENCASED PER S-23, UNLESS OTHERWISE APPROVED BY THE COUNTY ENGINEER.
15. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET L.A. COUNTY ROAD DEPT. OR CALIFORNIA STATE HIGHWAY REQUIREMENTS IN ACCORDANCE WITH PERMITS.
16. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.3.7 OF THE STANDARD SPECIFICATIONS.
17. REFER TO SECTION 7-10.4.1 OF THE STANDARD SPECIFICATIONS, REGARDING SAFETY ORDERS.
19. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CLAY PIPE SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "C" OR "D", (WITH BUSHING IF NECESSARY) PER STANDARD SPECIFICATIONS, SECTION 208-5.

THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE COUNTY ENGINEER SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LEGEND	S-5
MINIMUM PUBLIC SAFETY REQUIREMENTS	S-2
BRICK MANHOLE	S-8
NON-REINFORCED PRECAST CONCRETE MANHOLE	S-36
~~REINFORCED PRECAST CONCRETE MANHOLE~~	~~S-6~~
~~MANHOLE FRAME AND COVER~~	~~S-15~~
STANDARD MANHOLE STEP	S-17
BEDDING FOR SEWER PIPE	S-21
CRADLING AND ENCASEMENT	S-23
WYE OR TEE SUPPORT	S-20
ALLOWABLE TRENCH WIDTHS	S-33
CHIMNEY PIPE AND BASE	S-27
LOCKING MANHOLE FRAME & COVER	S-35

County Sanitation Districts shall be notified prior to the following so that required inspection can be made (Phone 337-1025 or ~~685-8097~~)

Acceptance of the project.

No connections for the disposal of industrial wastes shall be made to sewers shown on these drawings without written permission from the Chief Engineer and General Manager of the County Sanitation Districts.

PROFILE, ALIGNMENT AND GRADE OF
SANITARY SEWERS
CONSTRUCTED IN
THE OLD ROAD
AT MAGIC MOUNTAIN PARKWAY
PRIVATE CONTRACT NO. 8536

P.C. 8536
PAGE 1

W.S. 63
1 SHEET; 2 PAGES
SCALE: VERT. 1" = 8' HORIZ. 1" = 40' SEPT , 1970

42092

PREPARED IN THE OFFICES OF
SIKAND ENGINEERING ASSOCIATES, INC.
15205 BURBANK BOULEVARD
VAN NUYS, CALIFORNIA 91401 787-8550
By: Ronald R. Horn
REG. C. E. NO. 16913

NOTE:
GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTER LINE OF STREETS, OR CENTER LINE OF ALLEYS ARE SHOWN BY CIRCLES ON PROFILES. AT ALL POINTS BETWEEN DESIGNATED POINTS THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGNATED POINTS.
ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1929.
WORK SHALL BE CONSTRUCTED ACCORDING TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (1970 EDITION) AND COUNTY ENGINEER SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWERS DATED APRIL 2, 1970, AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY ENGINEER.
BEFORE WORK CAN BE STARTED, THE CONTRACTOR MUST OBTAIN A PERMIT TO EXCAVATE IN COUNTY STREETS FROM THE L. A. COUNTY ROAD DEPT., DISTRICT OFFICE NO. ...5..., AND PAY A FEE TO THE COUNTY ENGINEER, ROOM 330, COUNTY ENGINEERING BUILDING, 108 WEST SECOND STREET OR ....NEWHALL.................... REGIONAL OFFICE, SUFFICIENT TO COVER THE COST OF CONSTRUCTION INSPECTION AND RECORD PLANS.
APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE, OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE APPLIES TO ALL PAGES.
IF WORK IS TO BE DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA, DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.

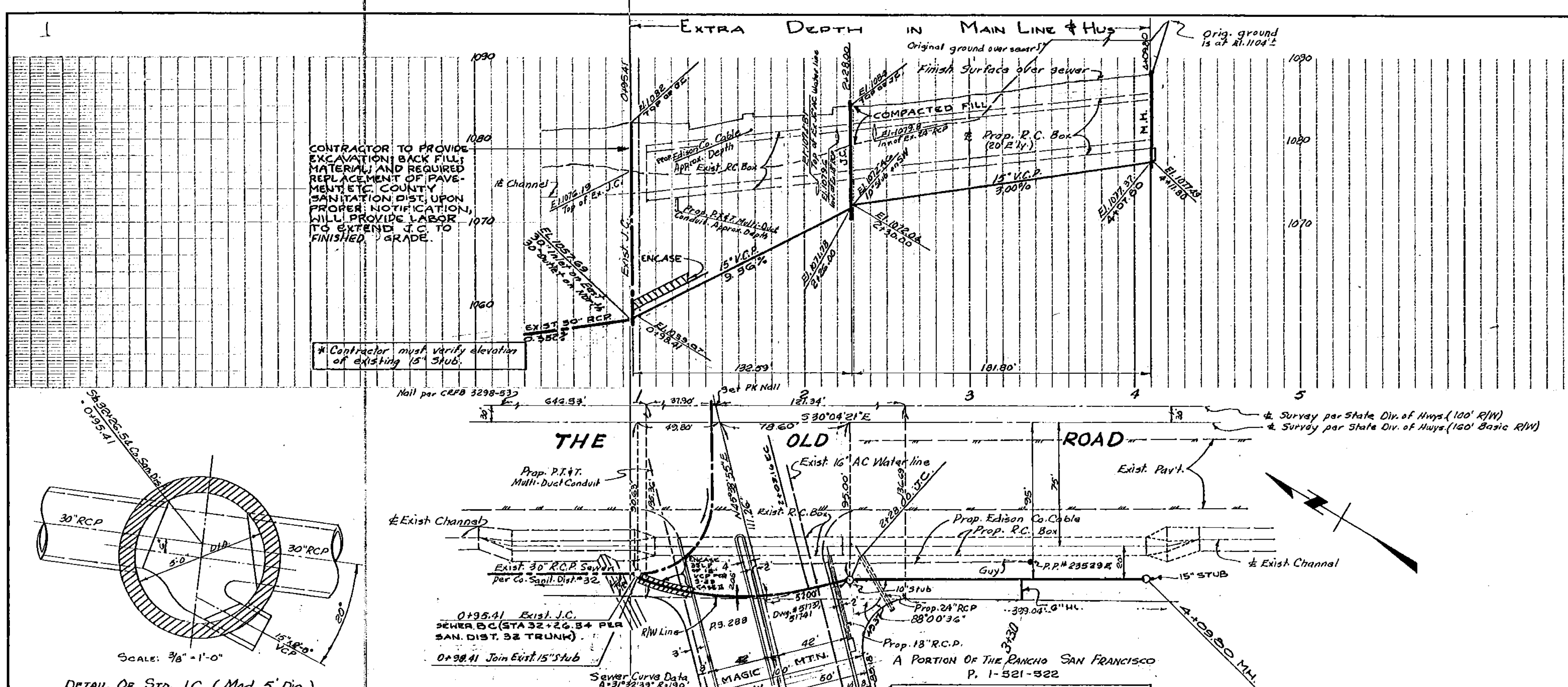
COUNTY OF LOS ANGELES, CALIFORNIA
JOHN A. LAMBIE, COUNTY ENGINEER — J. D. PARKHURST, CHIEF ENGINEER
CO. SAN. DIST. NO. 32
APPROVED BY, [signature] 9/24/70 APPROVED BY [signature]
REGIONAL ENGINEER (DATE) OFFICE ENGINEER
CHECKED BY, [signature] 9-24-70
REG. C.E. NO. 14390

J.N. 0370.73

P.C. 8536 PAGE 2

DOUBLE SCALE
NO CHARGE FOR CONNECTIONS

42093



PC 8536
1

APPENDIX C – Exhibits and Maps

Exhibit 1: Entrada South Sewer Area Study Map

Table 4: VTTM 53295: Entrada South, Sewer Area Study
Sewer Flow Calculation Summary

AREA A

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
A2	81-83					0.080							
		WESTRIDGE PKWY	#41-#42	8	3.00%		0.080	0.013	0.959		8%	0.4000%	Gravity VCP
		MV (PC 12220D)				1.029							
		COMMERCE CTR DR	#42-#43	12	1.20%		1.109	0.013	1.866		59%	0.4800%	Gravity VCP
A1	84-86, 88					0.044							
		"A" STREET	#45-#46	8	2.50%		0.044	0.013	0.876		5%	0.4000%	Gravity VCP
		"D" STREET	#46-#47	8	4.00%		0.044	0.013	1.108		4%	0.4000%	Gravity VCP
A3	61-70, 59					0.152							
		PRIVATE DRIVE	#47-#48	8	2.00%		0.196	0.013	0.783		25%	0.4000%	Gravity VCP
A4	55-58					0.103							
		PRIVATE DRIVE	#48-#49	8	2.00%		0.299	0.013	0.783		38%	0.4000%	Gravity VCP
A5	38-39					0.056							
		COMMERCE CTR DR	#49-#50	8	2.00%		0.355	0.013	0.783		45%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#50-#43	8	1.00%		0.355	0.013	0.553		64%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#43-#44	12	4.40%		1.464	0.013	3.577		41%	0.7600%	Gravity VCP
		COMMERCE CTR DR	#44-#40	15	1.16%		1.464	0.013	3.391		43%	0.0800%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$

AREA B

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
B1 C + B1 R	41					0.156							
		PRIVATE DRIVE	#60-#61	8	1.720%		0.156	0.013	0.726		21%	0.400%	Gravity VCP
B2	51, 54					0.097							
		PRIVATE DRIVE	#61-#63	8	1.720%		0.253	0.013	0.726		35%	0.400%	Gravity VCP
B3	37, 40					0.026							
		PRIVATE DRIVE	#62-#63	8	1.720%		0.026	0.013	0.726		4%	0.400%	Gravity VCP
		PRIVATE DRIVE	#63-#64	8	1.720%		0.279	0.013	0.726		38%	0.400%	
B4	44, 45					0.035							
		PRIVATE DRIVE	#64-#65	8	1.720%		0.314	0.013	0.726		43%	0.400%	Gravity VCP
B5	48-50 52-53					0.122							
B6	46-47					0.049							
		PRIVATE DRIVE	#65-#66	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
		PRIVATE DRIVE	#66-#69	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
B7	30					0.002							
		B STREET	#67-#69	8	2.930%		0.002	0.013	0.948		0%	0.400%	Gravity VCP
		B STREET	#69-#70	8	2.930%		0.486	0.013	0.948		51%	0.840%	Gravity VCP
		M.M.P	#70-#82	8	2.000%		0.486	0.013	0.783		62%	0.840%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$

AREA C

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
C1	17-19					0.102							
		PRIVATE DRIVE	#80-#81	8	1.210%		0.102	0.013	0.609		17%	0.400%	Gravity VCP
C2	20-23					0.191							
		PRIVATE DRIVE	#81-#82	8	0.720%		0.293	0.013	0.469		63%	0.400%	Gravity VCP
		M.M.P	#82-#83	24	1.220%		2.243	0.013		23.032	10%	0.100%	Gravity VCP
C3C + C3H	9,10,11,12,13					0.346							
		M.M.P	#83-#22	24	1.220%		2.589	0.013		23.032	11%	0.100%	Gravity VCP

AREA D

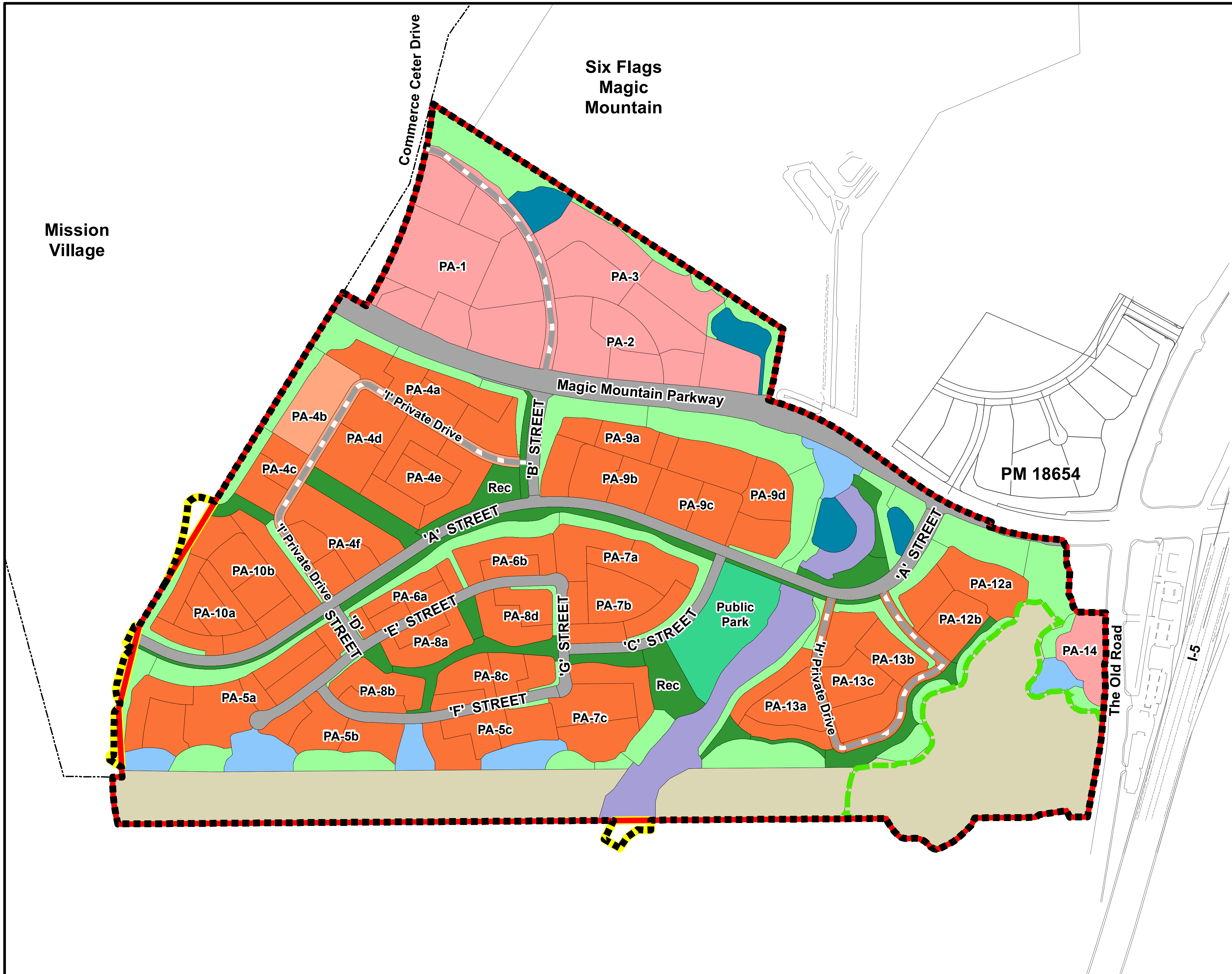
AREA E

Exhibit 2: Entrada South Sewer Tributary Area Exhibit

Area A
Area B
Area C
Area D
Area D
Area E
NAVIGATION AVE.
COMMERCE CENTER DRIVE
VTTM 53295 BOUNDARY
TRUNK SEWER PER LACSD (SCVSD) SC-P-0007
TRUNK SEWER PER LACSD (SCVSD) SC-P-0006
MV2
MV1
12" SEWER PER PC 12220B
EXISTING 10' SS EASEMENT PER TRACT MAP 61105-01
8" SEWER PER PC 12220E
10" SEWER PER PC 12220E
12" SEWER PER PC 12220E
"OO" STREET
"A" STREET
"B" STREET
"C" STREET
"D" STREET
"E" STREET
"F" STREET
"G" STREET
"H" STREET
WESTRIDGE PKWY
MAGIC MOUNTAIN ENTRANCE
MEDIA CENTER LANE
SKY VIEW LANE
THE OLD ROAD
RYE CANYON ROAD
GOLDEN STATE FREEWAY
DISTRICT 32 VALENCIA WATER RECLAMATION PLANT
EXISTING LACSD 30" SEWER C.S.D. 32-P-0003
EXISTING 24" TRUNK SEWER PER LACSD SC-P-0001
EXISTING LACSD 6" FORCE MAIN
EXISTING 18" SEWER PER PC 8536
EXISTING 8" SEWER PER PC 11839
EXISTING LACSD 8" SEWER
PROJECT SITE
VICINITY MAP
LEGEND
ENTRADA 53295
OVERALL SEWER TRIBUTARY AREA
EXHIBIT
LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
OWNER/DEVELOPER:
FIVEPOINT
25124 SPRINGFIELD COURT SUITE 300
VALENCIA, CA 91355
TELEPHONE: (661) 255-4000
REPRESENTATIVE : MR. MILES HELFRICH
PLANS PREPARED BY:
HUNSAKER & ASSOCIATES
PERMIT NO.
SHEET 1 OF 1
G:\Newhall Ranch\53295 Entrada\Exh\HES054-01_Entrada Tributary Area Exhibit.dwg Plotted On Dec 05, 2022-8:54am by alirezas

Exhibit 3: Entrada-Cumulative VTTM 53295 GIS Land Use Map

ENTRADA SOUTH VTTM 53295 LAND USE



Legend

- VTTM 53295 Boundary
- Project Site
- External Map Improvements
- Spineflower Preserve Area
- Newhall Ranch Specific Plan Boundary

Land Use

- M.F.-Condo
- Comm-Business Park
- Mixed Use-Residential
- Mixed Use-Commercial
- P.F.-Drainage
- P.F.-Debris Basin
- P.F.-Water Quality
- Open Space
- O.S.-NAT
- Public Park
- Recreation
- Public Road
- Private Drive

HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING • ENGINEERING • SURVEYING
26074 Avenue Hall, Suite 23 • Valencia, CA 91355 • PH: (661) 294-2211 • FX: (661) 294-9890

DATE: 10/25/2021
JOB#:0015-035-019

REVISED ON: 07/08/2022
SHEET 1 OF 1

FIVEPOINT

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Technical Memorandum

Date: November 13th, 2023

To: **NIKKO PAJARILLAGA**

From: Alireza Sazegari
Hunsaker & Associates Los Angeles, Inc.

cc: Jason H. Fukumitsu, PE

Re: VTTM 53295 Sewer Area Study PC 12056AS
ESTU2022000057
Addendum 1

The purpose of Addendum 1 is to present the diversion of the sewer discharge in Newhall Ranch-Entrada South (VTTM 53295) per PC 12056AS, to match construction phasing. See revised ENTRADA 53295, SEWER AREA STUDY MAP attached to this memorandum for changes and affected areas.
As per the latest Vesting Tentative Tract Map No 53295 the construction phasing line divides the site along B and G street into two sections, East and West of B and G streets. In result, sewage generation area D is divided into two areas, existing D subareas west of G street remains as area D. The remaining D subareas, East of G street become the newly formed area F. The new Area D will discharge to existing 24" Trunk sewer on Magic Mountain PKWY (SC-p-0007) via newly proposed pipe which connects to existing Area B on B street. Area F will drain as originally proposed for old area D. Furthermore, Subarea D3 has been split into two parts, with the western part remaining as Area D3 and the eastern part becoming the new Area D5.

Attached revised Table 3 demonstrates changes in discharge within sewage generation areas A through D and F. Revised Table 4 (Study Sewer Flow Calculation Summary) show the updated confluence discharge rate in each segment. The tables indicate the current sewer system is adequate with the newly proposed flows. Based on the provided calculations presented in this memorandum, there are no significant changes to the existing sewer system.

REGISTERED PROFESSIONAL ENGINEER
JASON H. FUKUMITSU
No. 40695
CIVIL
STATE OF CALIFORNIA

SEWER AREA STUDY
APPROVED

REVIEWED BY: ______ DATE 5/6/2024

APPROVED BY: ______ DATE 5/13/2024

COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION

THIS APPROVAL EXPIRES TWO YEARS FROM THE DATE OF APPROVAL

Attachments:

- Revised Table 3 (Area A-D, F)
- Revised Table 4
- Revised ENTRADA 53295, SEWER AREA STUDY MAP
- Phasing Map (Sheet 5 of MAJOR LAND DIVISON VESTING TENTAIVE TRACT MAP NO. 53295)

Revised Table 3

Sewage Generation Calculation

(Area A-D, F)

Table 3: VTTM 53295: Entrada South, Sewer Area Study

Area A

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (du)				
A1	84-86, 88	PA-5a	MULTI-FAMILY	3.68	0.012		25	300	0.044	0.029	0.044
A2	81-83	PA-5a	MULTI-FAMILY	6.64	0.012		45	300	0.080	0.052	0.080
A3	61-70, 59	PA-10a & b	MULTI-FAMILY	12.73	0.012		115	300	0.153	0.133	0.153
A4	55-58	PA-4f	MULTI-FAMILY	5.85	0.012		89	300	0.070	0.103	0.103
A5	38-39	PA-4c	MULTI-FAMILY	2.62	0.012		48	300	0.031	0.056	0.056

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area B

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
B1 C	41	PA-4b	MU-COMMERCIAL	3.44	0.015	17,025		100	0.052	0.007	0.052
B1 R	41	PA-4b	MU-RESIDENTIAL	3.44	0.012		92	300	0.041	0.107	0.107
B2	51, 54	PA-4d	MULTI-FAMILY	4.22	0.012		84	300	0.051	0.097	0.097
B3	~~37~~, 40	PA-4a	MULTI-FAMILY	1.41	0.012		22	300	0.017	0.026	0.026
B4	44, 45	PA-4a	MULTI-FAMILY	2.34	0.012		30	300	0.028	0.035	0.035
B5	48-50 52, 53	PA-4e	MULTI-FAMILY	7.25	0.012		105	300	0.087	0.122	0.122
B6	46-47	PA-4a	MULTI-FAMILY	3.27	0.012		42	300	0.039	0.049	0.049
B7	30		RECREATION	1.71	0.001				0.002		0.002

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5
[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area C

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day) (gal/room)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
C1	17-19	PA-1	COMMERCIAL	6.83	0.015	72,666		200	0.102	0.056	0.102
C2	20-24	PA-1	COMMERCIAL	12.73	0.015	222,234		200	0.191	0.172	0.191
C3 H	25-27	PA-2	MU-HOTEL	6.28	0.015		220	150	0.094	0.128	0.128
C3 C	2, 8-14	PA- 3	MU-COMMERCIAL	17.96	0.015	213,925		200	0.269	0.165	0.269

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area D

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
D1	89-91	PA-5b	MULTI-FAMILY	4.28	0.012		34	300	0.051	0.039	0.051
D2	111-112	PA-8b	MULTI-FAMILY	3.10	0.012		24	300	0.037	0.028	0.037
D3	115-116	PA-8c West	MULTI-FAMILY	2.26	0.012		27	300	0.027	0.031	0.031
D4	92-94	PA-5c	MULTI-FAMILY	4.80	0.012		39	300	0.058	0.045	0.058
D5	117-118	PA-8c East	MULTI-FAMILY	2.01	0.012		25	300	0.024	0.029	0.029
D6	113-114	PA-8a	MULTI-FAMILY	2.93	0.012		26	300	0.035	0.030	0.035
D7	97-102	PA-6a	MULTI-FAMILY	3.08	0.012		30	300	0.037	0.035	0.037
D8	103-104	PA-6b	MULTI-FAMILY	3.22	0.012		26	300	0.039	0.030	0.039
D9	119-120	PA-8d	MULTI-FAMILY	3.31	0.012		26	300	0.040	0.030	0.040
D10 P	161	PARK	PARK/REC	5.36	0.001				0.005		0.005
D10 R	135	RECREATION	PARK/REC	1.53	0.001				0.002		0.002
D11	123-128	PA-7a & 7b	MULTI-FAMILY	10.37	0.012		89	300	0.124	0.103	0.124
D12	141-143,146-148	PA-9a & 9b	MULTI-FAMILY	7.92	0.012		116	300	0.095	0.135	0.135
D13	144-145, 149-151	PA-9c & 9d	MULTI-FAMILY	10.47	0.012		110	300	0.126	0.128	0.128
D14	175-180	PA-13b &13c	MULTI-FAMILY	8.47	0.012		104	300	0.102	0.121	0.121
D15	171-173	PA-13a	MULTI-FAMILY	4.88	0.012		68	300	0.059	0.079	0.079
D16	185-187	PA-12a & 12b	MULTI-FAMILY	7.00	0.012		76	300	0.084	0.088	0.088

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 53295: Entrada South, Sewer Area Study
Area F

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)(gal/du.day)	Q BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
F1	129-131	PA-7c	MULTI-FAMILY	6.50	0.012		57	300	0.078	0.066	0.078
F2 P	161	PARK	PARK/REC	5.40	0.001				0.005		0.005
F2 R	135	RECREATION	PARK/REC	2.27	0.001				0.002		0.002
F3	123-128	PA-7a & 7b	MULTI-FAMILY	10.37	0.012		89	300	0.124	0.103	0.124
F4	141-143,146-148	PA-9a & 9b	MULTI-FAMILY	7.91	0.012		116	300	0.095	0.135	0.135
F5	144-145, 149-151	PA-9c & 9d	MULTI-FAMILY	10.47	0.012		110	300	0.126	0.128	0.128
F6	175-179	PA-13b &13c	MULTI-FAMILY	7.80	0.012		104	300	0.094	0.121	0.121
F7	171-173	PA-13a	MULTI-FAMILY	4.88	0.012		68	300	0.059	0.079	0.079
F8	185-187	PA-12a & 12b	MULTI-FAMILY	7.00	0.012		76	300	0.084	0.088	0.088

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Revised Table 4

Sewer Flow Calculation Summary

AREA A

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
A2	81-83					0.080							
		WESTRIDGE PKWY	#41-#42	8	3.00%		0.080	0.013	0.959		8%	0.4000%	Gravity VCP
		MV (PC 12220D)				1.029							
		COMMERCE CTR DR	#42-#43	12	1.20%		1.109	0.013	1.866		59%	0.4800%	Gravity VCP
A1	84-86, 88					0.044							
		"A" STREET	#45-#46	8	2.50%		0.044	0.013	0.876		5%	0.4000%	Gravity VCP
		"D" STREET	#46-#47	8	4.00%		0.044	0.013	1.108		4%	0.4000%	Gravity VCP
A3	61-70, 59					0.153							
		PRIVATE DRIVE	#47-#48	8	2.00%		0.197	0.013	0.783		25%	0.4000%	Gravity VCP
A4	55-58					0.103							
		PRIVATE DRIVE	#48-#49	8	2.00%		0.300	0.013	0.783		38%	0.4000%	Gravity VCP
A5	38-39					0.056							
		COMMERCE CTR DR	#49-#50	8	2.00%		0.356	0.013	0.783		45%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#50-#43	8	1.00%		0.356	0.013	0.553		64%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#43-#44	12	4.40%		1.465	0.013	3.577		41%	0.7600%	Gravity VCP
		COMMERCE CTR DR	#44-#40	15	1.16%		1.465	0.013	3.391		43%	0.0800%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.

2) Calculated Q (cfs) is based on land use, see table 3.

3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").

4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.

5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA B

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
B1 C + B1 R	41					0.158							
		PRIVATE DRIVE	#60-#61	8	1.720%		0.158	0.013	0.726		22%	0.400%	Gravity VCP
B2	51, 54					0.097							
		PRIVATE DRIVE	#61-#63	8	1.720%		0.256	0.013	0.726		35%	0.400%	Gravity VCP
B3	37, 40					0.026							
		PRIVATE DRIVE	#62-#63	8	1.720%		0.026	0.013	0.726		4%	0.400%	Gravity VCP
		PRIVATE DRIVE	#63-#64	8	1.720%		0.281	0.013	0.726		39%	0.400%	
B4	44, 45					0.035							
		PRIVATE DRIVE	#64-#65	8	1.720%		0.316	0.013	0.726		44%	0.400%	Gravity VCP
B5	48-50 52, 53					0.122							
B6	46-47					0.049							
		PRIVATE DRIVE	#65-#66	8	1.720%		0.487	0.013	0.726		67%	0.840%	Gravity VCP
		PRIVATE DRIVE	#66-#69	8	1.720%		0.487	0.013	0.726		67%	0.840%	Gravity VCP
B7	30					0.002							
		"B" STREET	#67-#10	8	2.930%		0.002	0.013	0.948		0.2%	0.400%	Gravity VCP
From Area D	Area D					0.357							
		"A" STREET	#9-#10	8	8.210%		0.357	0.013	1.588		22%	0.840%	Gravity VCP
		"B" STREET	#10-#69	8	2.930%		0.359	0.013	0.948		38%	0.840%	Gravity VCP
		"B" STREET	#69-#70	8	2.930%		0.845	0.013	0.948		89%	2.400%	Gravity VCP
PC 12220E		M.M.P	#70-#82	8	2.000%		0.845	0.013	0.783		108%	N/A	Exising 8" VCP per PC 12220E

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.

2) Calculated Q (cfs) is based on land use, see table 3.

3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").

4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.

5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA C

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
C1	17-19					0.102							
		PRIVATE DRIVE	#80-#81	8	1.210%		0.102	0.013	0.609		17%	0.400%	Gravity VCP
C2	20-24					0.191							
		PRIVATE DRIVE	#81-#82	8	0.720%		0.293	0.013	0.469		63%	0.400%	Gravity VCP
		M.M.P	#82-#83	24	1.220%		2.603	0.013		23.032	11%	0.100%	Gravity VCP
C3C + C3H	2, 8-14					0.397							
		M.M.P	#83-#22	24	1.220%		3.000	0.013		23.032	13%	0.100%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.

2) Calculated Q (cfs) is based on land use, see table 3.

3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").

4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.

5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA D

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
D1	89-91					0.051							
		"F" STREET	#1-#2	8	6.000%		0.051	0.013	1.357		4%	0.400%	Gravity VCP
D2	111-112					0.037							
		"F" STREET	#2-#3	8	5.200%		0.089	0.013	1.263		7%	0.400%	Gravity VCP
D3	115-116					0.031							
		"F" STREET	#3-#4	8	6.000%		0.120	0.013	1.357		9%	0.400%	Gravity VCP
D4	92-94					0.058							
		"F" STREET	#4-#5	8	3.600%		0.177	0.013	1.051		17%	0.400%	Gravity VCP
D5	117-118					0.029							
		"F" STREET	#5-#8	8	1.510%		0.207	0.013	0.680		30%	0.400%	Gravity VCP
D6	113-114					0.035							
		"E" STREET	#6-#7	8	5.300%		0.035	0.013	1.275		3%	0.400%	Gravity VCP
D7	97-102					0.037							
		"E" STREET	#7-#9	8	5.200%		0.072	0.013	1.263		6%	0.400%	Gravity VCP
D9	119-120					0.040							
		"G" STREET	#8-#9	8	1.000%		0.246	0.013	0.553		45%	0.400%	Gravity VCP
D8	103-104					0.039							
		"G" STREET	#9-#10	8	8.210%		0.357	0.013	1.588		22%	0.440%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

AREA E

Tributary Area	LOT Number	Street	Segment	Existing Pipe Size (in)	Exist Pipe Slope[1]	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate (Q_{design}/$Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
E1	194					0.040							
		THE OLD ROAD	E1-#90	8	2.000%		0.040	0.013	0.783		5%	0.400%	Gravity VCP
		THE OLD ROAD	#90-#91	8	1.400%		0.040	0.013	0.655		6%	0.400%	Gravity VCP
E2	Exist Lot					0.033							
		THE OLD ROAD	#91-MH #231	8	1.160%		0.073	0.013	0.596		12%	0.400%	Gravity VCP
		THE OLD ROAD	MH#231-MH#138	8	2.160%		0.073	0.013	0.814		9%	0.400%	Gravity VCP
Existing	Existing					6.190							
		THE OLD ROAD	MH#138-MH#137	15	3.000%		6.263	0.013		10.090	62%	1.200%	Gravity VCP
		THE OLD ROAD	MH#137-Trunk	15	9.960%		6.263	0.013		18.400	34%	1.200%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.

2) Calculated Q (cfs) is based on land use, see table 3.

3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").

4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$

Q_{kutter}=A*C* (R*S)$^{1/2}$

AREA F

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
F1	0					0.078							
		"G" STREET	F1-#11	8	2.000%		0.078	0.013	0.783		10%	0.400%	Gravity VCP
F2P+F2R	161, 135					0.008							
		"C" STREET"	#11-#12	8	2.800%		0.086	0.013	0.927		9%	0.680%	Gravity VCP
F3	123-128					0.124							
		"C" STREET"	#12-#13	8	1.770%		0.210	0.013	0.736		29%	1.120%	Gravity VCP
F4	141-143, 146-148					0.135							
		"A" STREET	#14-#15	8	0.820%		0.135	0.013	0.501		27%	0.400%	Gravity VCP
F5	144-145, 149-151					0.128							
		"A" STREET	#15-#13	8	2.500%		0.262	0.013	0.876		30%	0.400%	Gravity VCP
		"A" STREET	#13-#18	8	3.300%		0.472	0.013	1.006		47%	0.400%	Gravity VCP
F6	175-179					0.121							
			#16-#17	8	0.770%		0.121	0.013	0.485		25%	0.400%	Gravity VCP
F7	171-173					0.079							
		"A" STREET	#17-#18	8	1.100%		0.200	0.013	0.580		34%	0.400%	Gravity VCP
		"A" STREET	#18-#20	8	7.500%		0.672	0.013	1.517		44%	3.640%	Gravity VCP
F8	185-187					0.088							
		"H" STREET	#19-#20	8	2.000%		0.088	0.013	0.783		11%	0.400%	Gravity VCP
		"A" STREET	#20-#21	8	5.000%		0.760	0.013	1.239		61%	4.320%	Gravity VCP
PC 12220E		M.M.P.	#21-#22	12	6.000%		0.760	0.013	4.177		18%	0.440%	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/$R^{1/2}$

Q_{kutter}=A*C* $(R*S)^{1/2}$

Entrada 53295

Sewer Area Study Map

Table 4: VTTM 53295: Entrada South, Sewer Area Study
Sewer Flow Calculation Summary

AREA A

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by ~~volume~~ flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
A2	81-83					0.080							
		WESTRIDGE PKWY	#41-#42	8	3.00%		0.080	0.013	0.959		8%	0.4000%	Gravity VCP
		MV (PC 12220D)				1.029							
		COMMERCE CTR DR	#42-#43	12	1.20%		1.109	0.013	1.866		59%	0.4800%	Gravity VCP
A1	84-86, 88					0.044							
		"A" STREET	#45-#46	8	2.50%		0.044	0.013	0.876		5%	0.4000%	Gravity VCP
		"D" STREET	#46-#47	8	4.00%		0.044	0.013	1.108		4%	0.4000%	Gravity VCP
A3	61-70, 59					~~0.152~~ 0.153	0.197						
		PRIVATE DRIVE	#47-#48	8	2.00%		~~0.196~~	0.013	0.783		25%	0.4000%	Gravity VCP
A4	55-58					0.103	0.300						
		PRIVATE DRIVE	#48-#49	8	2.00%		~~0.299~~	0.013	0.783		38%	0.4000%	Gravity VCP
A5	38-39					0.056	0.356						
		COMMERCE CTR DR	#49-#50	8	2.00%		~~0.355~~	0.013	0.783		45%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#50-#43	8	1.00%		~~0.355~~ 0.356	0.013	0.553		64%	0.4000%	Gravity VCP
		COMMERCE CTR DR	#43-#44	12	4.40%		~~1.464~~ 1.465	0.013	3.577		41%	0.7600%	Gravity VCP
		COMMERCE CTR DR	#44-#40	15	1.16%		~~1.464~~ 1.465	0.013	3.391		43%	0.0800%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$

~~**AREA B**~~

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
B1 C + B1 R	41					0.156							
		PRIVATE DRIVE	#60-#61	8	1.720%		0.156	0.013	0.726		21%	0.400%	Gravity VCP
B2	51, 54					0.097							
		PRIVATE DRIVE	#61-#63	8	1.720%		0.253	0.013	0.726		35%	0.400%	Gravity VCP
B3	37, 40					0.026							
		PRIVATE DRIVE	#62-#63	8	1.720%		0.026	0.013	0.726		4%	0.400%	Gravity VCP
		PRIVATE DRIVE	#63-#64	8	1.720%		0.279	0.013	0.726		38%	0.400%	
B4	44, 45					0.035							
		PRIVATE DRIVE	#64-#65	8	1.720%		0.314	0.013	0.726		43%	0.400%	Gravity VCP
B5	48-50 52-53					0.122							
B6	46-47					0.049							
		PRIVATE DRIVE	#65-#66	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
		PRIVATE DRIVE	#66-#69	8	1.720%		0.484	0.013	0.726		67%	0.840%	Gravity VCP
B7	30					0.002							
		B STREET	#67-#69	8	2.930%		0.002	0.013	0.948		0%	0.400%	Gravity VCP
		B STREET	#69-#70	8	2.930%		0.486	0.013	0.948		51%	0.840%	Gravity VCP
		M.M.P	#70-#82	8	2.000%		0.486	0.013	0.783		62%	0.840%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$

AREA C

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by ~~volume~~ flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
C1	17-19					0.102							
		PRIVATE DRIVE	#80-#81	8	1.210%		0.102	0.013	0.609		17%	0.400%	Gravity VCP
C2	20-~~23~~ 24					0.191							
		PRIVATE DRIVE	#81-#82	8	0.720%		0.293	0.013	0.469		63%	0.400%	Gravity VCP
	2, 8-14	M.M.P	#82-#83	24	1.220%	0.397	~~2.243~~ 2.603	0.013		23.032	~~10%~~ 11%	0.100%	Gravity VCP
C3C + C3H	~~9,10,11,12,13~~					~~0.346~~							
		M.M.P	#83-#22	24	1.220%		~~2.589~~ 3.000	0.013		23.032	~~11%~~ 13%	0.100%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity is calculated using Kutter's formula at 3/4 full condition (≥15").

C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$

~~**AREA D**~~

Tributary Area	Lot Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
D1	89-91					0.051							
		"F" STREET	#1-#2	8	6.000%		0.051	0.013	1.357		4%	0.400%	Gravity VCP
D2	111-112					0.037							
		"F" STREET	#2-#3	8	5.200%		0.089	0.013	1.263		7%	0.400%	Gravity VCP
D3	115-118					0.060							
		"F" STREET	#3-#4	8	6.000%		0.149	0.013	1.357		11%	0.400%	Gravity VCP
D4	92-94					0.058							
		"F" STREET	#4-#5	8	3.600%		0.207	0.013	1.051		20%	0.400%	Gravity VCP
D5	129-131					0.078							
		"G" STREET	#5-#10	8	2.000%		0.284	0.013	0.783		36%	0.400%	Gravity VCP
D6	113-114					0.035							
		"E" STREET	#6-#7	8	5.300%		0.035	0.013	1.275		3%	0.400%	Gravity VCP
D7	97-102					0.037							
		"E" STREET	#7-#8	8	5.200%		0.072	0.013	1.263		6%	0.400%	Gravity VCP
D8	103-104					0.039							
		"G" STREET	#8-#9	8	1.000%		0.111	0.013	0.553		20%	0.400%	Gravity VCP
D9	119-120					0.040							
		"G" STREET	#9-#10	8	1.000%		0.150	0.013	0.553		27%	0.400%	Gravity VCP
		"C" STREET"	#10-#11	8	3.000%		0.435	0.013	0.959		45%	0.680%	Gravity VCP
D10P + D10R	161					0.007							
		"C" STREET"	#11-#12	8	2.800%		0.442	0.013	0.927		48%	0.680%	Gravity VCP
D11	123-128					0.124							
		"C" STREET"	#12-#13	8	1.770%		0.566	0.013	0.736		77%	1.120%	Gravity VCP
D12	141-143, 146-148					0.135							
		"A" STREET	#14-#15	8	0.820%		0.135	0.013	0.501		27%	0.400%	Gravity VCP
D13	144-145, 149-151					0.128							
		"A" STREET	#15-#13	8	2.500%		0.262	0.013	0.876		30%	0.400%	Gravity VCP
		"A" STREET	#13-#18	8	3.300%		0.828	0.013	1.006		82%		Gravity VCP
D14	175-180					0.121							
			#16-#17	8	0.770%		0.121	0.013	0.485		25%	0.400%	Gravity VCP
D15	171-173					0.079							
		"A" STREET	#17-#18	8	1.100%		0.200	0.013	0.580		34%	0.400%	Gravity VCP
		"A" STREET	#18-#20	8	7.500%		1.028	0.013	1.517		68%	3.640%	Gravity VCP
D16	185-187					0.088							
		"H" STREET	#19-#20	8	2.000%		0.088	0.013	0.783		11%	0.400%	Gravity VCP
		"A" STREET	#20-#21	8	5.000%		1.116	0.013	1.239		90%	4.320%	Gravity VCP
		"A" STREET	#21-#22	12	6.000%		1.116	0.013	4.177		27%	0.440%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
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Q_{kutter}=A*C* (R*S)$^{1/2}$

AREA E

Tributary Area	LOT Number	Street	Segment	Existing Pipe Size (in)	Exist Pipe Slope[1]	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by ~~volume~~ flow rate ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q	Comment
E1	194					0.040							
		THE OLD ROAD	E1-#90	8	2.000%		0.040	0.013	0.783		5%	0.400%	Gravity VCP
		THE OLD ROAD	#90-#91	8	1.400%		0.040	0.013	0.655		6%	0.400%	Gravity VCP
E2	Exist Lot					0.033							
		THE OLD ROAD	#91-MH #231	8	1.160%		0.073	0.013	0.596		12%	0.400%	Gravity VCP
		THE OLD ROAD	MH#231-MH#138	8	2.160%		0.073	0.013	0.814		9%	0.400%	Gravity VCP
Existing	Existing					6.190							
		THE OLD ROAD	MH#138-MH#137	15	3.000%		6.263	0.013		10.090	62%	1.200%	Gravity VCP
		THE OLD ROAD	MH#137-Trunk	15	9.960%		6.263	0.013		18.400	34%	1.200%	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
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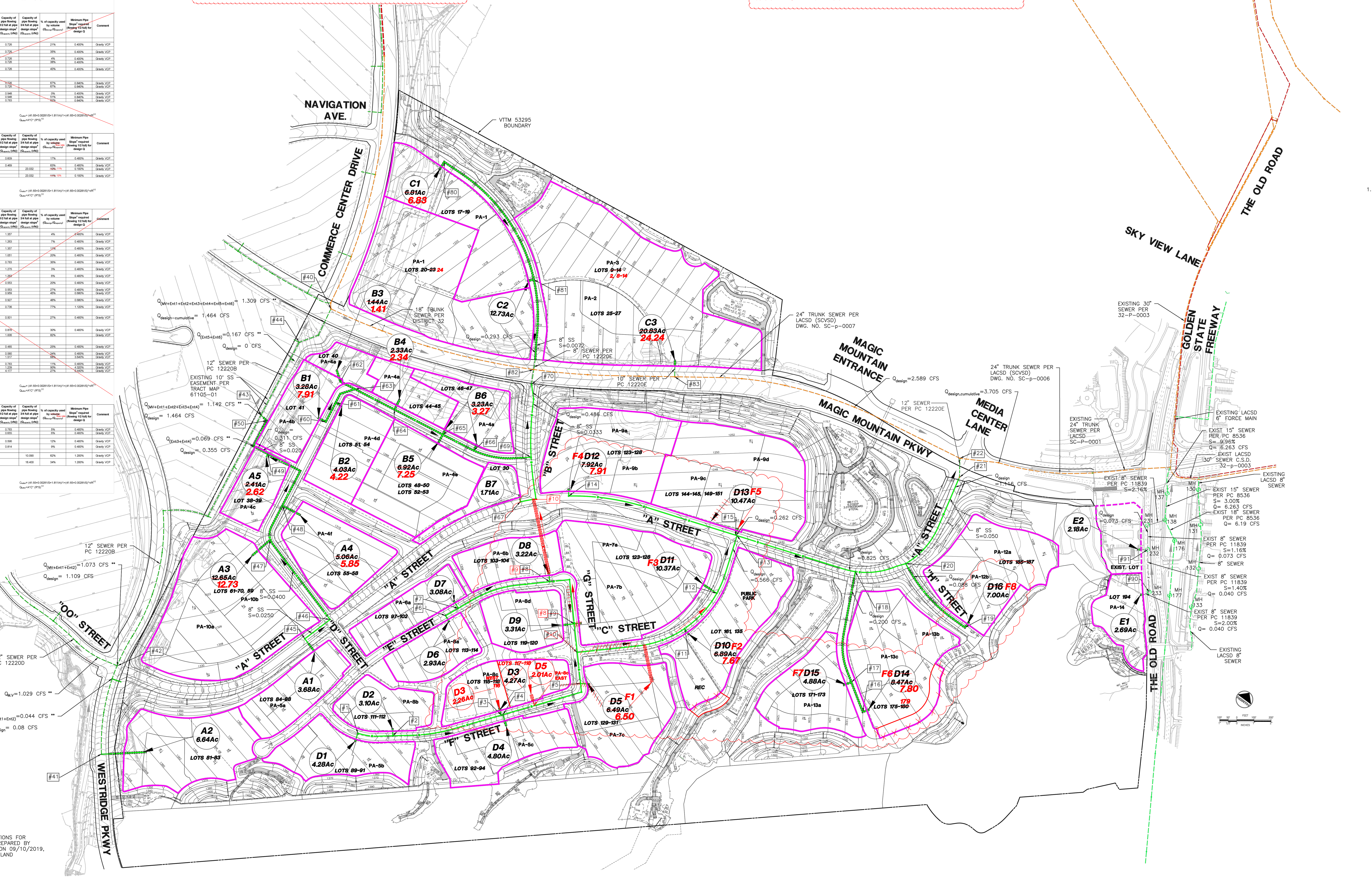
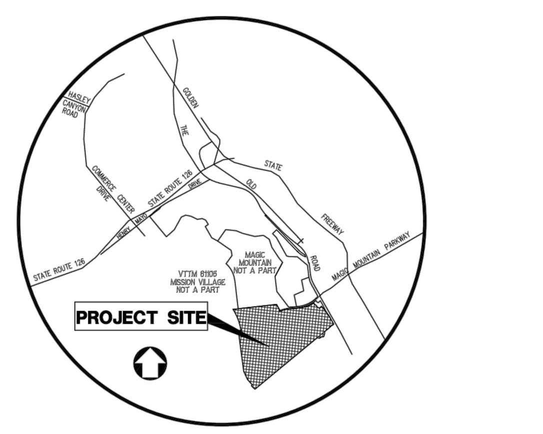
C_{kutter}= (41.65+0.00281/S+1.811/n)/1+(41.65+0.00281/S)*n/R$^{1/2}$
Q_{kutter}=A*C* (R*S)$^{1/2}$



** Q PER APPROVED SEWER AREA STUDY PROPOSED CONDITIONS FOR AMENDED TRACT 061105, MISSION VILLAGE, PC 11831AC PREPARED BY HUNSAKER & ASSOCIATES DATED 08/2019 AND APPROVED ON 09/10/2019, BY LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS, LAND DEVELOPMENT DIVISION.



VICINITY MAP
NOT TO SCALE

LEGEND

SEWER EASEMENT
PROPOSED SEWER
EXISTING LACSD TRUNK SEWER
EXISTING LACSD FORCE MAIN
EXISTING LACSD SEWER MAIN
EXISTING LOCAL SEWER
PROPOSED SEWER STUDY SUBAREA
TRACT BOUNDARY
FLOW PATH
EXISTING FLOW PATH
#10 SEGMENT NODE
E1 SUBAREA/LOT DESIGNATION
X.X Ac SUBAREA ACREAGE/OFFSITE FLOW

GENERAL NOTES

1. ALL EXISTING PIPES/STUBS PER PC12220B THAT ARE NOT IN USE TO BE ABANDONED IN PLACE. END OF PIPE TO BE CAPPED AT THE MANHOLE. A REVISION TO PC12220B IS REQUIRED PRIOR TO APPROVAL OF FINAL SEWER IMPROVEMENT PLANS FOR THAT TRIBUTARY AREA.

HUNSAKER & ASSOCIATES
FIVEPOINT
ENTRADA 53295
SEWER AREA STUDY MAP
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

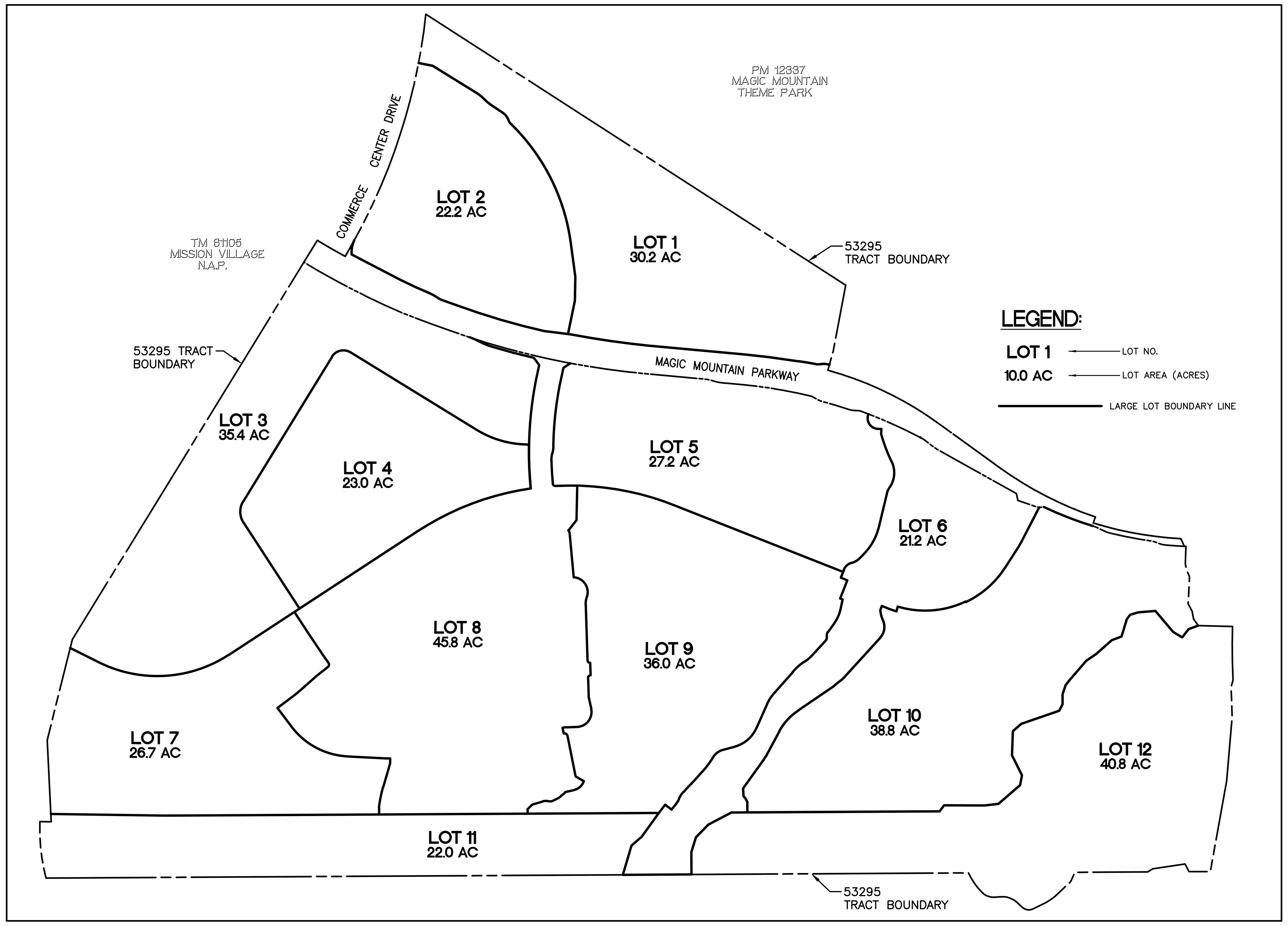
SHEET 1 OF 1

Major Land Division

Vesting Tentative Tract Map No. 53295

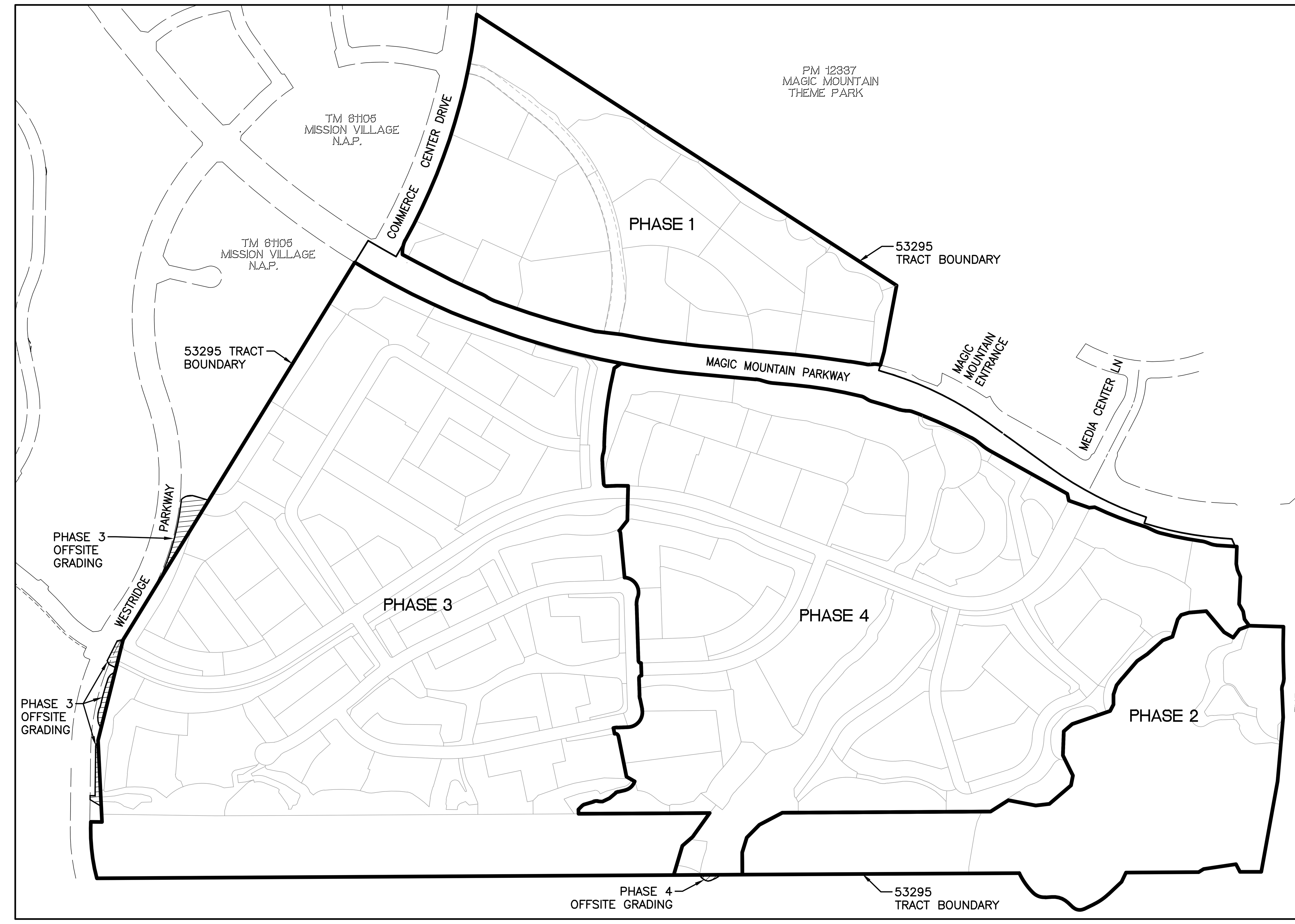
Large Lot Parcel Map

And Phasing Map



LARGE LOT PARCEL MAP

FEET 300' 150' 0' 300' 600'
INCHES 1" ½" 0" 1" 2"



PHASING MAP

FEET 300' 150' 0' 300' 600'
INCHES 1" ½" 0" 1" 2"

PHASE 1	
Total Ac	52.4 AC
Total On-Site AC	52.4 AC
Total Off-Site AC	0.0 AC
Total DU (Condo)	0 DU
Total Commercial SF	673,825 SF
Total Open Space	6.0 AC

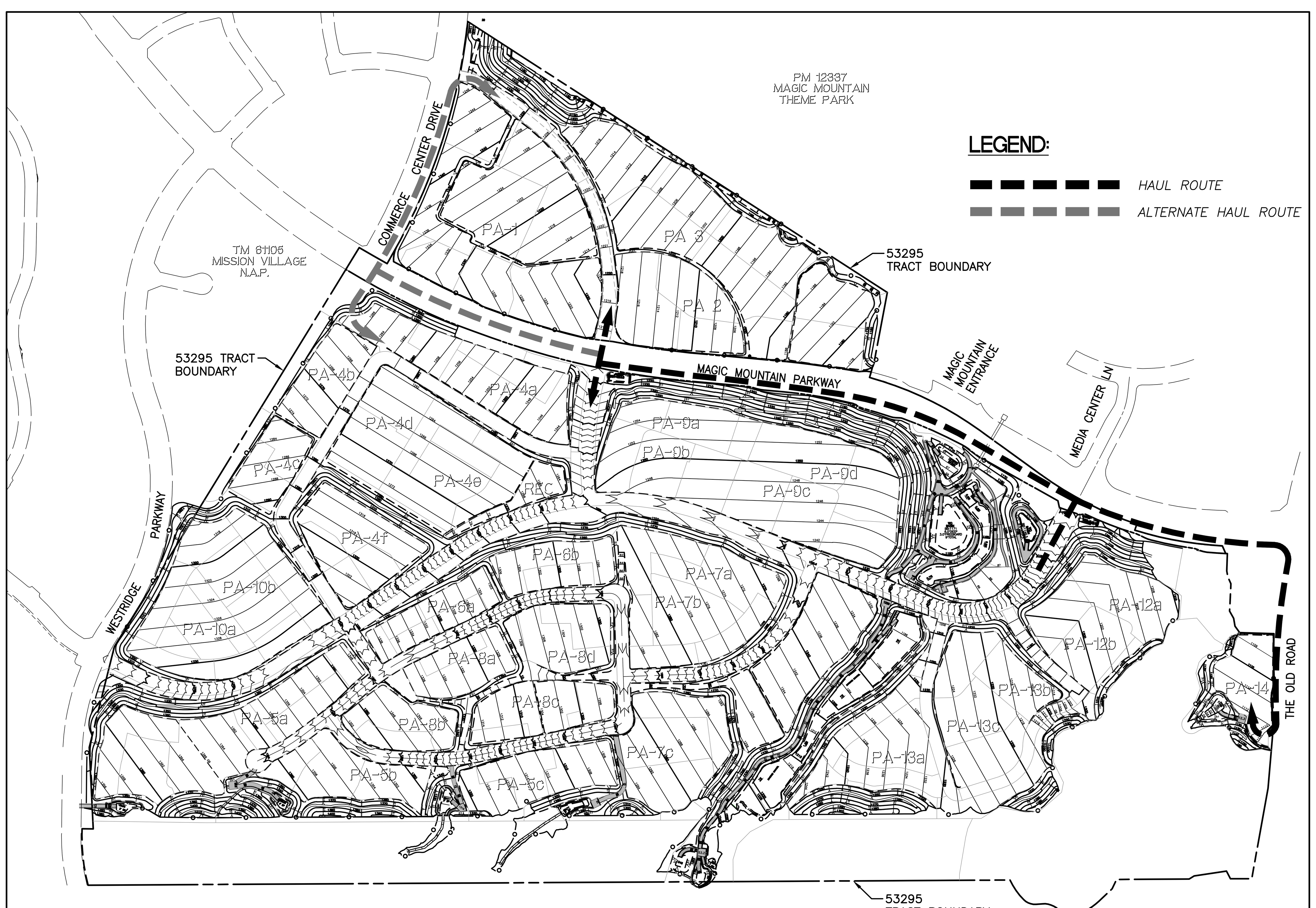
PHASE 2	
Total AC	40.8 AC
Total On-Site AC	40.8 AC
Total Off-Site AC	0.0 AC
Total DU (Condo)	0 DU
Total Commercial SF	39,150 SF
Total Open Space	37.6 AC

PHASE 3	
Total AC	154.2 AC
Total On-Site AC	152.9 AC
Total Off-Site AC	1.3 AC
Total DU (Condo)	954 DU
Total Commercial SF	17,025 SF
Total Open Space	42.0 AC

PHASE 4	
Total Ac	123.3 AC
Total On-Site AC	123.2 AC
Total Off-Site AC	0.1 AC
Total DU (Condo)	620 DU
Total Commercial SF	0 SF
Total Open Space	33.3 AC

NOTE: SPINEFLOWER PRESERVE AND PARKS ARE INCLUDED IN TOTAL OPEN SPACE CALCULATION
13.0 ACRES OF DEDICATED MAGIC MOUNTAIN PARKWAY NOT INCLUDED HERE

THE PROJECT IS PROPOSED TO BE DEVELOPED IN FIVE PHASES, BUT WE HEREBY REQUEST TO CHANGE THE ORDER OF PHASES AS LONG AS SUFFICIENT INFRASTRUCTURE IS IN PLACE TO BUILD EACH PHASE TO THE SATISFACTION OF REGIONAL PLANNING, PUBLIC WORKS, AND THE FIRE DEPARTMENT.



HAUL ROUTE MAP

FEET 300' 150' 0' 300' 600'
INCHES 1" ½" 0" 1" 2"

DESIGNED:	NO.	REVISIONS	DATE	BY
DRAFTED:				
CHECKED: JFukumitsu				

OWNER/DEVELOPER:
FIVEPOINT®
NEWHALL LAND
25124 SPRINGFIELD COURT SUITE 300
VALENCIA, CA 91355
TELEPHONE: (661) 255-4000
REPRESENTATIVE : MR. MILES HELFRICH

REGISTERED PROFESSIONAL ENGINEER
JASON H. FUKUMITSU
No. 40695
CIVIL
STATE OF CALIFORNIA

PLANS PREPARED BY:
HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
26074 Avenue Hall, Ste 23 ▪ Valencia, CA 91355
PH: (661) 294-2211 ▪ FX: (661) 294-9890
JASON H. FUKUMITSU, DATE

MAJOR LAND DIVISION
VESTING TENTATIVE TRACT MAP NO. 53295
LARGE LOT PARCEL MAP
AND PHASING MAP

IN THE UNINCORPORATED AREA OF THE COUNTY OF LOS ANGELES STATE OF CALIFORNIA

DATE	05/05/2023
SCALE	AS SHOWN
PROJECT NO.	0015-035-036
SHEET 5 OF 5 SHEETS	

Appendix 5.12c

Valencia Commerce Center Sewer Area Study

Sewer Area Study
Proposed Conditions for
VTPM 18108
Newhall Ranch – Valencia Commerce Center

County of Los Angeles

Hunsaker Project No:
0015-035-036
Prepared on October 04, 2022
EIMP2022000054
PC 12077AS

Prepared for:

FIVEPOINT
25124 Springfield Court Suite 300
Valencia, CA 91355

Prepared by:

Alireza Sazegari
Hunsaker and Associates, LA Inc.
26074 Avenue Hall, Suite 23
Valencia, CA 91355
Telephone: (661) 294-2211

Under the supervision of:

REGISTERED PROFESSIONAL ENGINEER
JASON H. FUKUMITSU
No. 40695
CIVIL
STATE OF CALIFORNIA

Jason H. Fukumitsu RCE 40695 Exp. 03/31/2025

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B. Exhibits and Maps

Exhibit 1. Valencia Commerce Center Sewer Tributary Area Exhibit

Exhibit 2. Valencia Commerce Center VTPM 18108 GIS Land Use

Exhibit 3. Valencia Commerce Center Sewer Area Study Map

C. Reference Plans / Reports

1. Los Angeles County Department of Public Works Area Study Zoning Coefficients
2. SMD Maps: N-1216 and N-1217
3. Existing Sewer Plans: PC 11120, PC 11645, and 32-p-0006
4. Rating Table for Sewer Pipe

1. INTRODUCTION

The purpose of this report is to provide sewer main sizing for the proposed Valencia Commerce Center (VTPM 18108) development.

The project is located in unincorporated Los Angeles County. The project is bounded roughly by the SR126 to the south, The Old Road to the east, Commerce Center Drive to the west, and east of new development and existing improvements PM26363, PM22261 & PM20839.

The proposed development does not receive offsite flow, and travels to the Santa Clarita Valley Sanitation District (SCVSD) Los Angeles County (LAC). The majority of the project site flows westerly on the proposed Franklin Parkway, and Hancock Parkway to existing 18" VCPs per PC11120 and PC11645. The northeasterly portion of the project site (PA-1) drains to the east, and connects into an existing 24" trunk sewer owned by LACSD (Los Angeles County Sanitation District) then drains south along The Old Road toward the Castaic Pumping Plan Lift Station (SCVSD 1 Valencia Water Reclamation Plant as shown in 32-p-0006).

In addition, phased upgrades to Hancock Parkway Pump Station (PS#2) made to accommodate PM 22261, 20839, 26363, and VTPM 18108 PA-4&7 will be discussed by Dexter Wilson Engineering, Inc (DWE Job No 721-470) in a separate memorandum (ESTU2022000625).

2. PROJECT LAND USE AND TOPOGRAPHY

The proposed Valencia Commerce Center (VTPM 18108) will include industrial, and commercial land uses. All areas that would contribute towards sewage generation were included in the sewer area study analysis. Sewage generation from future development in areas PA-4 and PA-7 are also accounted for the critical flow pipe sizing but these areas are not part of this study.

A breakdown of the various land use within the proposed development and its area can be found in Table 1 in Appendix A. Each land use type has a corresponding sewer generation coefficient which was used in the analysis that is found in Table 2. Where information is available, the building area is used to calculate the sewer flow. Otherwise, the acres zoned for a specific land use is used with the appropriate acre-based sewer generation factor. These calculations can be found in Table 3, Area A to C as part of appendix A.

3. METHODOLOGY

The project was divided into 3 tributary study areas, with most areas being further divided into sub-areas based on land use. Exhibit 1: Valencia Commerce Center Sewer Tributary Area Exhibit in Appendix B shows these study areas. Each tributary area was delineated based on the proposed topography of the site, and the proposed sewer drainage system.

Sewer flow rate for PM 22261, 20839 & 26363 were calculated per below table for the purpose of this study.

SUMMARY OF PLANNING SEWAGE FLOW (EXISTING ONLY)

PM Number	Area (Acres)	Zoning coefficient	Flow by zoning, (cfs)
PM 22261 (Existing)	59.50	0.021	1.250
PM 20839 (Existing)	65.93	0.021	1.385
PM 26363 (Existing)	50.20	0.021	1.054
TOTAL EXISTING PEAK FLOW (PLANNING FACTOR BASED)	175.63	0.021	3.689

Sewer discharge rates were computed as a product of the zoning coefficients and the land use data (acres, or occupancy). Land use data was compiled based on an area calculation of each tributary as shown in Exhibit 2: Valencia Commerce Center VTPM 18108 GIS Land Use in Appendix B. Sewage generation factors were based on the Los Angeles County Department of Public Works zoning coefficients for private contract sewer projects. Table 3 (Area A to Area C) from appendix 1 shows the calculations for the sewer discharges from each tributary area to be used in pipe sizing calculations.

Planning Area 7 (Area D) and Planning Area 7 (Area E) sewage generation is also calculated in table 3, Area D and E to be used for the purpose of this study as part of future developments.

Tabulated flows from each tributary area are combined and routed through the project site, see Exhibit 3: Valencia Commerce Center Sewer Area Study Map in Appendix B. The design flow rates required for a given sewer segment will be used for pipe sizing. This design flow rate is the higher of the zoning or occupancy flow rate. Minimum sizes and slopes are based upon the minimum street grade in a specific sewer reach. In some cases, the minimum sizes and slopes are based upon other design considerations such as utility conflicts, topography, or proposed grading. The design sizes and slopes for individual sewer segments are shown in Table 4 of Appendix A. Exhibit 3 in Appendix B identifies the nodes and subareas listed in the sewer routing system referred to within Table 4.

4. SEWER TRIBUTARY AREAS

Valencia Commerce Center (VTPM 18108) has 3 tributary areas: A, B and C. The capacity of each pipe segment was analyzed in Table 4.

Area A is located on the eastern side of the project. Flows from this area drain easterly into an existing sewer line-32-p-0006. Area A consists of commercial lots.

Area B is located on the southern side of the project. Flows from this area drain westerly then enter an existing sewer line-PC 11645. Area B consists of commercial lots.

Area C is located on the northwestern corner, and center portions of the project. Flows from this area drain southwesterly and westerly into an existing sewer line-PC 11120. Area C consists of industrial and commercial lots.

Area D and E are not part of PM 18108. However, the mentioned areas are part of this sewer area study because they will ultimately contribute flow to the sewer shed. Flows from Area D drain southerly then enter an existing 8” sewer line stub-PC 11645. Area D consists of commercial lots. Flows from Area E will be ultimately drained in to a 10” existing gravity sewer line from PC 11120. Area E consist of industrial lots.
Sewage generation from these areas are used for sizing new system and checking the capacity of the existing system.

5. CONCLUSIONS AND RECOMMENDATIONS

Pipe sizing and slopes for individual sewer segments are listed in Table 4: Sewer Flow Calculation Summary in Appendix A. An existing stub in PC 11645 located within the intersection of Commerce Center Drive and Hancock Parkway, connected to Manhole at Sta. 36+86.37 Per PC 11645 will need to be upsized. The existing stub is 8 inches in diameter and the proposed pipe upstream of it is 15 inches in diameter. This existing stub was not sized to accommodate flow from Area B. Therefore, the existing stub will need to become 15 inches in diameter.

New 18-inch gravity VCP is proposed to discharge sewage from the proposed force main lines of Hancock pump station to the existing 24” LACSD Trunk sewer line along Turnberry Ln. Capacity of this line is also verified at table 4 from Appendix A. The Q design value calculations for this pipe is per “Hydraulic Outlet Study for TM18108 in Los Angeles County presented by Dexter Wilson Engineering, Inc.

6. REFERENCES

- Los Angeles County Design & Supporting Data Manual
  - Chapter 46: Private Contract Sewer General Notes
  - Chapter 47: Sewer Area Study

APPENDIX A - TABLES

TABLE 1: LAND USE STATISTICS

TABLE 2: SEWAGE GENERATION COEFFICIENTS

VTTM 0118108: Valencia Commerce Center, Sewer Area Study

Table 1: Land Use Statistics

Land Use	Area (ac)
Mixed Use-Commercial/Business Park	93.4
Industrial	24.1

Table 2. Los Angeles County Department of Public Works – Estimated Average Daily Sewage Flow for Various Occupancies and Zoning Coefficients.

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow
Apartment Buildings:		
Bachelor or Single dwelling units	Apt	150 gal/D.U.
1 bedroom dwelling units	Apt	200 gal/D.U.
2 bedroom dwelling units	Apt	250 gal/D.U.
3 bedroom or more dwelling units	Apt	300 gal/D.U.
Auditoriums, churches, etc.	Aud	5 gal/seat
Automobile parking	P	25 gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20 gal/seat
Commercial Shops & Stores	CS	100 gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500 gal/bed
Hospitals (convalescent)	HC	85 gal/bed
Hotels	H	150 gal/room
Medical Buildings	MB	300 gal/1000 sq ft gross floor area
Motels	MB	150 gal/unit
Office Buildings	Off	200 gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50 gal/seat
Schools:		
Elementary or Jr. High	S	10 gal/student
High Schools	HS	15 gal/student
Universities or Colleges	U	20 gal/student
College Dormitories	CD	85 gal/student

*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture ----------------------------------	0.001
Residential*:	
R-1 ---	0.004
R-2 ---	0.008
R-3 ---	0.012
R-4 ---	0.016*
Commercial:	
C-1 through C-4 ---------------------------	0.015*
Heavy Industrial:	
M-1 through M-4 -------------------------	0.021*

* Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown
* Use 0.001 (cfs/unit) for condominiums only

TABLE 3: SEWAGE GENERATION CALCULATION

Table 3: VTTM 0118108: Valencia Commerce Center, Sewer Area Study
Area A

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	FLOW BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
A1	92-97	PA-1	COMMERCIAL	9.62	0.015	174,300		200	0.144	0.135	0.144
A2			INDUSTRIAL	5.20	0.021				0.109	0.000	0.109
A3			INDUSTRIAL	4.27	0.021				0.090	0.000	0.090
A4			INDUSTRIAL	7.00	0.021				0.147	0.000	0.147

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 0118108: Valencia Commerce Center, Sewer Area Study
Area B

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	FLOW BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
B1-OFFICE	83-86,88,89	PA-2.3	COMMERCIAL	17.43	0.015	649,800		200	0.262	0.503	
B1-PARKING	87	PA-2.3	PARKING			392,461		25		0.038	
B1	83-89	PA-2.3	COMMERCIAL	17.43					0.262	0.541	0.541
B2-OFFICE	77-80,82	PA-2.2	COMMERCIAL	10.48	0.015	368,400		200	0.157	0.285	
B2-PARKING	81	PA-2.2	PARKING			210,936		25		0.020	
B2	77-82	PA-2.2	COMMERCIAL	10.48					0.157	0.305	0.305
B3-OFFICE	68,69,71-73	PA-2.1	COMMERCIAL	13.25	0.015	302,600		200	0.199	0.234	
B3-PARKING	70	PA-2.1	PARKING			141,571		25		0.014	
B3	68-73	PA-2.1	COMMERCIAL	13.25					0.199	0.248	0.248

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 0118108: Valencia Commerce Center, Sewer Area Study

Area C

TRIBUTARY AREA	LOT NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	FLOW BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
C1	29-35	PA-3.3a	INDUSTRIAL	13.84	0.021	247,800		25	0.291	0.024	0.291
C2	28, 38-39	PA-3.3b	INDUSTRIAL	10.28	0.021	224,500		25	0.216	0.022	0.216
C3	43-44	PA-3.3c	COMMERCIAL	4.16	0.015	66,300		200	0.062	0.051	0.062
C4-OFFICE	48-59	PA-3.3d	COMMERCIAL	16.80	0.015	767,100		200	0.252	0.593	
C4-PARKING	47	PA-3.3d	COMMERCIAL			585,300		25		0.057	
C4	47-59	PA-3.3d	COMMERCIAL	16.80					0.252	0.650	0.650
C5-OFFICE	2-5,7-12	PA-3.1	COMMERCIAL	19.06	0.015	581,200		200	0.286	0.450	
C5-PARKING	6	PA-3.1	COMMERCIAL			351,500		25		0.034	
C5	2-12	PA-3.1	COMMERCIAL	19.06					0.286	0.484	0.484
C6	17, 20	PA-3.2	COMMERCIAL	2.55	0.015	18,000		100	0.038	0.007	0.038

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 0118108: Valencia Commerce Center, Sewer Area Study
Area D

TRIBUTARY AREA	APN NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	FLOW BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
D1	3271-002-038	PA-4	COMMERCIAL	27.1	0.015				0.407	0.000	0.407

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

Table 3: VTTM 0118108: Valencia Commerce Center, Sewer Area Study

Area E

TRIBUTARY AREA	APN NUMBER	PLANNING AREA	LANDUSE	LOT AREA (ac)	COEFF BY ZONING (cfs/ac)	UNIT COUNT BY OCCUPANCY		COEFF BY OCCUPANCY (gal/1000sf.day)	FLOW BY ZONING (cfs)	Q BY OCCUPANCY (cfs)[1]	Q DESIGN (cfs)[2]
						Gross Floor Area (sf)	DWELLING UNITS (DU)				
E1		PA-7.1	INDUSTRIAL	4.87	0.021				0.102	0.000	0.102
E2		PA-7.2	INDUSTRIAL	6.09	0.021				0.128	0.000	0.128

[1] Conversion from gal/day to cfs is 1.54723*10^-6, Conversion from average daily flow to peak flow is 2.5

[2] Q Design is the higher Q between Q zoning VS. Q occupancy

TABLE 4: SEWER FLOW CALCULATION SUMMARY

Table 4: VTTM 0118108: Valencia Commerce Center, Sewer Area Study
Sewer Flow Calculation Summary

AREA A

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
A1	92-97					0.144							
		Hancock Pkwy	A1- #1	8	0.0040		0.144	0.013	0.349		41%	0.0044	Gravity VCP
A2	EXIST					0.109							
		Hancock Pkwy	#1- #2	8	0.0040		0.253	0.013	0.349		73%	0.0044	Gravity VCP
A3	EXIST					0.090							
A4	EXIST					0.147							
		Muifield Lane	#2-#3	12	0.0024		0.490	0.013	0.829		59%	0.0024	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity for new construction is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

AREA B

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min) (in)	Prop Pipe Slope[1] (min) (ft/ft)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
B1	83-89					0.541							
		Hancock Pkwy	#20-#21	12	0.0032		0.541	0.013	0.959		56%	0.0024	Gravity VCP
B2	77-82					0.305							
		Hancock Pkwy	#21-#22	12	0.0032		0.846	0.013	0.959		88%	0.0028	Gravity VCP
B3	68-73					0.248							
		Hancock Pkwy	#22-#23	15	0.0032		1.094	0.013	1.774		62%	0.0040	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity for new construction is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

AREA C

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min) (ft/ft)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
C1	29-35					0.291							
		"A" Street	#40-#41	8	0.0092		0.291	0.013	0.530		55%	0.0040	Gravity VCP
C2	28, 38-39					0.216							
		Franklin Pkwy	#41-#42	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
		Franklin Pkwy	#42-#43	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
		Franklin Pkwy	#43-#44	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
C3	43-44					0.062							
		Franklin Pkwy	#44-#45	10	0.0092		0.569	0.013	0.986		58%	0.0032	Gravity VCP
C4	47-59					0.650							
		Franklin Pkwy	#45-#46	12	0.0092		1.219	0.013	1.633		75%	0.0056	Gravity VCP
C5	2-12					0.484							
		Franklin Pkwy	#46-#47	15	0.0096		1.702	0.013	3.084		55%	0.0040	Gravity VCP
C6	17, 20					0.038							
		Franklin Pkwy	#47-#48	15	0.0060		1.741	0.013	2.435		71%	0.0040	Gravity VCP
		Franklin Pkwy	#48-#49	15	0.0060		1.741	0.013	2.435		71%	0.0040	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity for new construction is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

AREA D & E

Tributary Area	LOT Number	Street	Segment	Exist Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
D1	3271-002-038					0.407							
		Private	#60-#61	10	0.0100		0.407	0.013	1.028		40%	0.0032	Gravity VCP
E1	PA-7.1					0.102							
E2	PA-7.2					0.128							
PM22261& PM20839& PM26363						3.689							
		Commerce Ctr Dr	#49-#61	18	0.0044		5.660	0.013		6.670	85%		Gravity VCP
		Commerce Ctr Dr	#61-#62	18	0.0044		6.066	0.012		6.880	88%		Gravity DIP
		Commerce Ctr Dr	#62-EXMH	2X18	0.0030		6.066	0.012		11.520	53%		Gravity DIP
		Commerce Ctr Dr	EXMH-#23	18	0.2464		6.066	0.012		52.450	12%		Gravity DIP
		Hancock Parkway	#23-PS	18	0.0060		7.160	0.013		7.410	97%		Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on land use, see table 3.
3) Pipe capacity for new construction is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

Turnberry Ln transfer Pipe Capacity Check

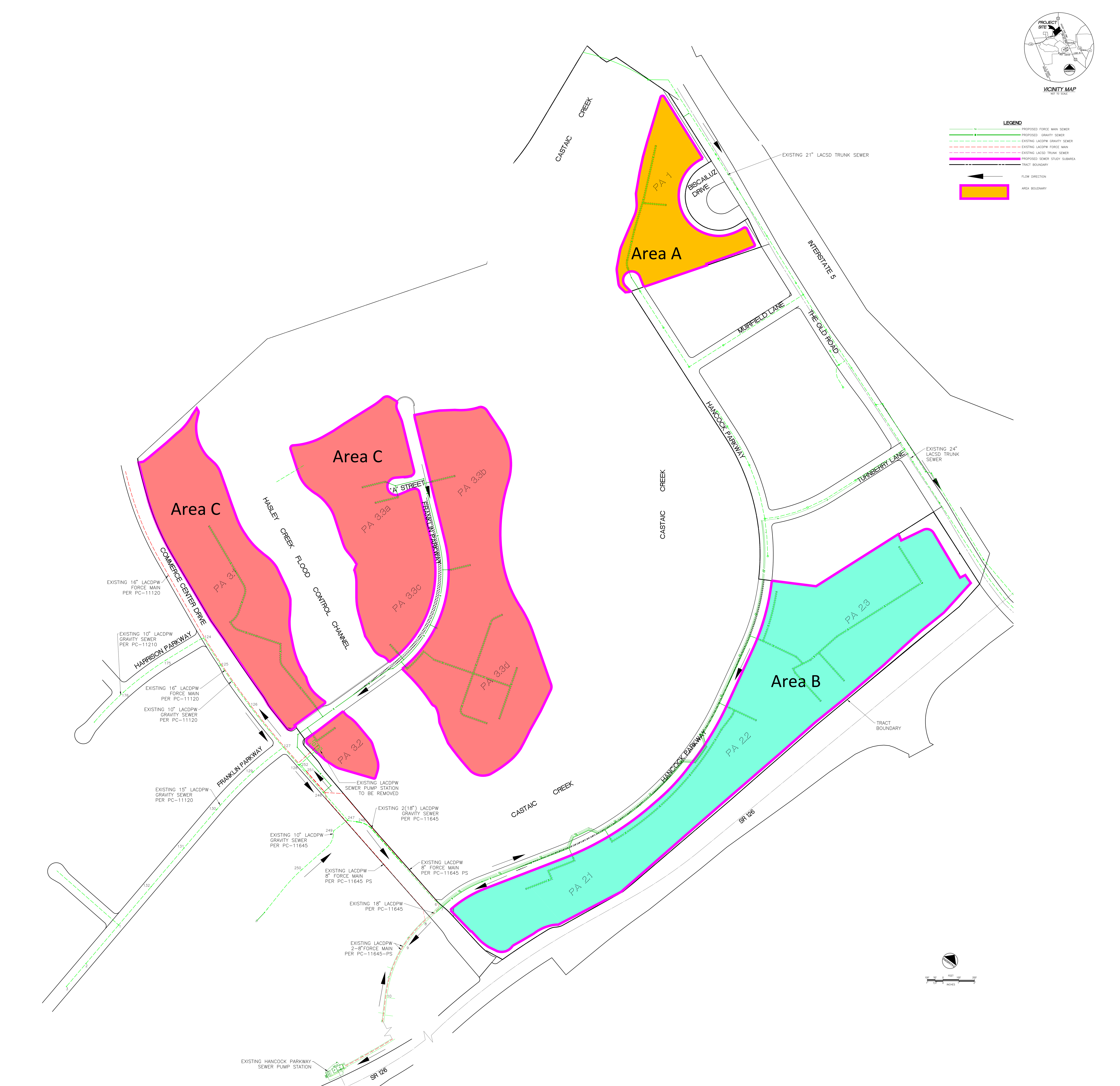
Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q[2] (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
		Turnberry Lane	#70-#71	18	0.0016	3.164	3.164	0.013		3.800	83%	0.0012	Gravity VCP

Notes:

1) Pipe slope reflects the flattest segment of sewer pipe.
2) Calculated Q (cfs) is based on Pump Station Pumpung rate.
3) Pipe capacity for new construction is calculated using Kutter's formula at half full condition (<15").
4) Minimum pipe slope is calculated based on the design Q and using Kutter's formula at half or 3/4 full condition based on the pipe size.
5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

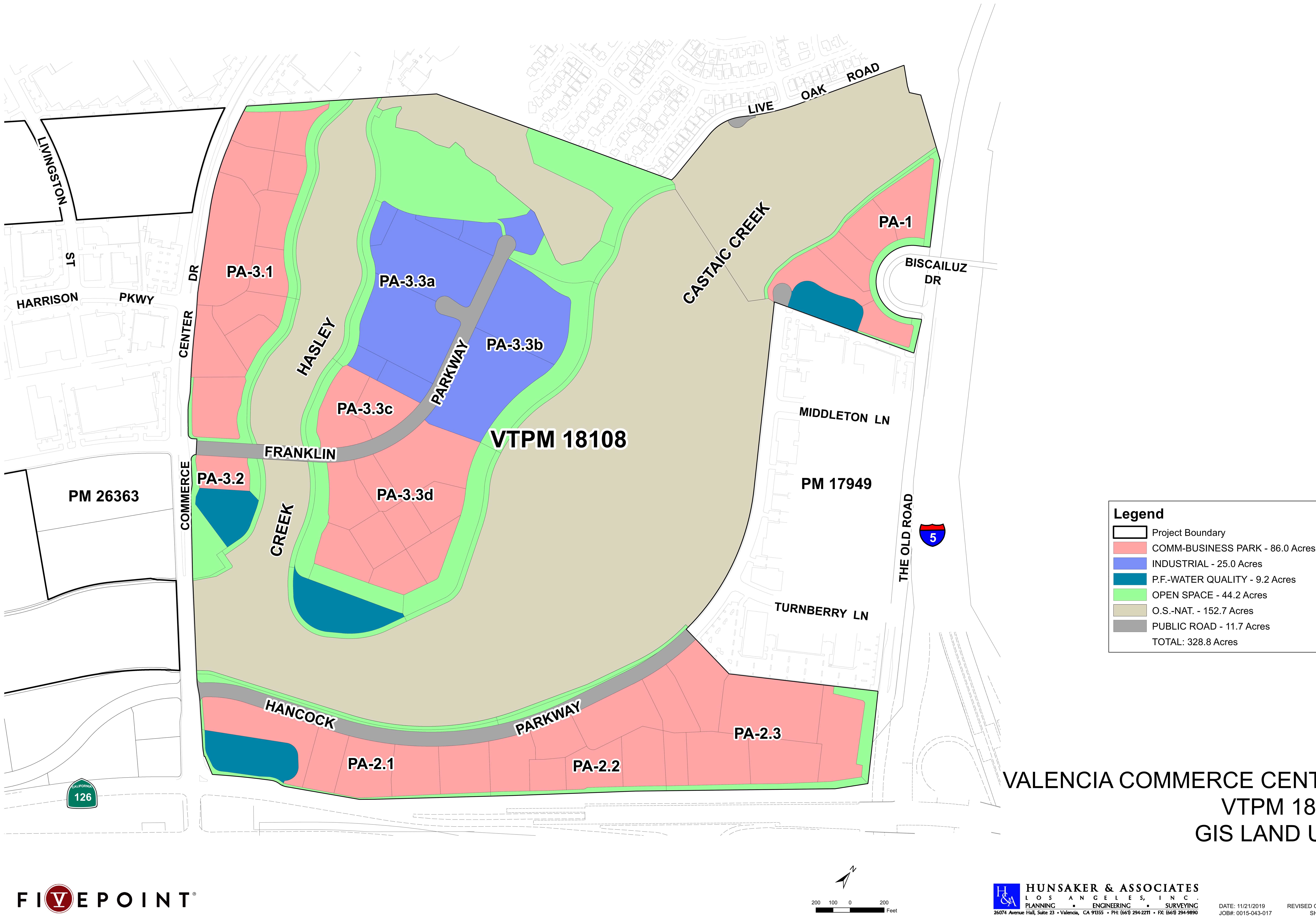
APPENDIX B – EXHIBITS AND MAPS

EXHIBIT 1: VALENCIA COMMERCE CENTER SEWER TRIBUTARY AREA EXHIBIT



DESIGNED: G.K. & W.L.					OWNER/DEVELOPER: FIVEPOINT® 25124 SPRINGFIELD COURT SUITE 300 VALENCIA, CA 91355	REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA	PLANS PREPARED BY: HUNSAKER & ASSOCIATES LOS ANGELES, INC. PLANNING ▪ ENGINEERING ▪ SURVEYING 26074 Avenue Hall, Ste 23 ▪ Valencia, CA 91355 PH: (661) 294-2211 ▪ FX: (661) 294-9890	COUNTY OF LOS ANGELES	SCALE: AS SHOWN
DRAFTED: G.K.								SEWER TRIBUTARY AREA EXHIBIT VESTING TENTATIVE PARCEL MAP 18108	DATE: 03/10/2020
									JOB No. 0015-043-020
CHECKED: W.L.	NO.		REVISIONS	DATE	BY		JASON H. FUKUMITSU DATE	IN THE UNINCORPORATED AREA OF THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA	SHEET 1 OF 1 SHEETS

EXHIBIT 2: VALENCIA COMMERCE CENTER VTPM 18108 GIS LAND USE



VALENCIA COMMERCE CENTER
VTPM 18108
GIS LAND USE

FIVEPOINT

HUNSAKER & ASSOCIATES
LOS ANGELES, INC.
PLANNING ▪ ENGINEERING ▪ SURVEYING
26074 Avenue Hall, Suite 23 ▪ Valencia, CA 91355 ▪ PH: (661) 294-2211 ▪ FX: (661) 294-9890

DATE: 11/21/2019
JOB#: 0015-043-017

REVISED ON: 08/30/2021
SHEET 1 OF 1

Document Path: G:\Newhall Ranch\18108 VCC\Exh\HCC056-01_VTPM18108_Land Use.mxd

EXHIBIT 3: VALENCIA COMMERCE CENTER SEWER AREA STUDY MAP

LEGEND

- PROPOSED FORCE MAIN PER OFFSITE SEWER STUDY MEMO
- PROPOSED SEWER
- EXISTING LACDPW GRAVITY SEWER
- EXISTING LACDPW FORCE MAIN
- EXISTING LACSD TRUNK SEWER
- PROPOSED SEWER STUDY SUBAREA
- TRACT BOUNDARY
- LOT LINE
- PROPOSED FLOW DIRECTION
- EXISTING FLOW DIRECTION
- PROPOSED FLOW PATH
- #10 SEGMENT NODE
- E1 / X.X Ac: SUBAREA/LOT DESIGNATION; SUBAREA ACREAGE/OFFSITE FLOW
- MH# 11: EXISTING MANHOLE. MANHOLE NUMBERS PER SMD N-1216 & N-1217

NOTE: SEWER LINES AND MANHOLES ARE FOR GRAPHICAL REPRESENTATION ONLY

Table 4: VTTM 0118108: Valencia Commerce Center, Sewer Area Study Sewer Flow Calculation Summary

AREA A

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
A1	92-97					0.144							
		Hancock Pkwy	A1- #1	8	0.0040		0.144	0.013	0.349		41%	0.0044	Gravity VCP
A2	EXIST					0.109							
		Hancock Pkwy	#1- #2	8	0.0040		0.253	0.013	0.349		73%	0.0044	Gravity VCP
A3	EXIST					0.090							
A4	EXIST					0.147							
		Muifield Lane	#2-#3	12	0.0024		0.490	0.013	0.829		59%	0.0024	Gravity VCP

AREA B

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min) (in)	Prop Pipe Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
B1	83-89					0.541							
		Hancock Pkwy	#20-#21	12	0.0032		0.541	0.013	0.959		56%	0.0024	Gravity VCP
B2	77-82					0.305							
		Hancock Pkwy	#21-#22	12	0.0032		0.846	0.013	0.959		88%	0.0028	Gravity VCP
B3	68-73					0.248							
		Hancock Pkwy	#22-#23	15	0.0032		1.094	0.013	1.774		62%	0.0040	Gravity VCP

AREA C

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Prop Pipe Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
C1	29-35					0.291							
		"A" Street	#40-#41	8	0.0092		0.291	0.013	0.530		55%	0.0040	Gravity VCP
C2	28, 38-39					0.216							
		Franklin Pkwy	#41-#42	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
		Franklin Pkwy	#42-#43	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
		Franklin Pkwy	#43-#44	10	0.0092		0.506	0.013	0.986		51%	0.0032	Gravity VCP
C3	43-44					0.062							
		Franklin Pkwy	#44-#45	10	0.0092		0.569	0.013	0.986		58%	0.0032	Gravity VCP
C4	47-59					0.650							
		Franklin Pkwy	#45-#46	12	0.0092		1.219	0.013	1.633		75%	0.0056	Gravity VCP
C5	2-12					0.484							
		Franklin Pkwy	#46-#47	15	0.0096		1.702	0.013	3.084		55%	0.0040	Gravity VCP
C6	17, 20					0.038							
		Franklin Pkwy	#47-#48	15	0.0060		1.741	0.013	2.435		71%	0.0040	Gravity VCP
		Franklin Pkwy	#48-#49	15	0.0060		1.741	0.013	2.435		71%	0.0040	Gravity VCP

AREA D & E

Tributary Area	LOT Number	Street	Segment	Exist Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
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		Commerce Ctr Dr	#61-#62	18	0.0044		6.066	0.012		6.880	88%		Gravity DIP
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Notes:
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Turnberry Ln transfer Pipe Capacity Check

Tributary Area	LOT Number	Street	Segment	Prop Pipe Size (min)(in)	Pipe Design Slope[1] (min) (ft/ft)	Subarea Q^2 (cfs) (Calculated Flow)	Design Q (Q_{design}) (cfs) (Cumulative Flow)	Kutter's n	Capacity of pipe flowing 1/2 full at pipe design slope[3] ($Q_{capacity}$ (cfs))	Capacity of pipe flowing 3/4 full at pipe design slope[5] ($Q_{capacity}$ (cfs))	% of capacity used by volume ($Q_{design}/Q_{capacity}$)	Minimum Pipe Slope[4] required (flowing 1/2 full) for design Q (ft/ft)	Comment
		Turnberry Lane	#70-#71	18	0.0016	3.164	3.164	0.013		3.800	83%	0.0012	Gravity VCP

Notes:
1) Pipe slope reflects the flattest segment of sewer pipe.
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5) Pipe capacity for new construction is calculated using Kutter's formula at 3/4 full condition (≥15").

* - PA-4, PA-7.1 AND PA-7.2 ARE NOT PART OF THIS STUDY.

DESIGNED: G.K. & W.L.		
DRAFTED: G.K.		
CHECKED: W.L.		
NO.	REVISIONS	DATE / BY

OWNER/DEVELOPER: FIVEPOINT, 25124 SPRINGFIELD COURT SUITE 300, VALENCIA, CA 91355

REGISTERED PROFESSIONAL ENGINEER JASON H. FUKUMITSU No. 40695 CIVIL STATE OF CALIFORNIA

PLANS PREPARED BY: HUNSAKER & ASSOCIATES LOS ANGELES, INC. PLANNING ▪ ENGINEERING ▪ SURVEYING 26074 Avenue Hall, Ste 23 ▪ Valencia, CA 91355 PH: (661) 294-2211 ▪ FX: (661) 294-9890

JASON H. FUKUMITSU DATE

COUNTY OF LOS ANGELES

SEWER AREA STUDY MAP
VESTING TENTATIVE PARCEL MAP 18108

IN THE UNINCORPORATED AREA OF THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

SCALE: AS SHOWN
DATE: 06/03/2020
JOB No. 0015-043-020
SHEET 1 OF 1 SHEETS

G:\Newhall Ranch\18108 VCC\Sewer\Study\HCC092-01_SAS.dwg Plotted On Mar 10, 2023-3:48pm

APPENDIX C – REFERENCE PLANS/REPORTS

1. LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS AREA STUDY ZONING COEFFICIENTS

Estimated Average Daily Sewage Flows for Various Occupancies

Occupancy	Abbreviation	*Average daily flow
Apartment Buildings:		
Bachelor or Single dwelling units	Apt	150 gal/D.U.
1 bedroom dwelling units	Apt	200 gal/D.U.
2 bedroom dwelling units	Apt	250 gal/D.U.
3 bedroom or more dwelling units	Apt	300 gal/D.U.
Auditoriums, churches, etc.	Aud	5 gal/seat
Automobile parking	P	25 gal/1000 sq ft gross floor area
Bars, cocktails lounges, etc.	Bar	20 gal/seat
Commercial Shops & Stores	CS	100 gal/1000 sq ft gross floor area
Hospitals (surgical)	HS	500 gal/bed
Hospitals (convalescent)	HC	85 gal/bed
Hotels	H	150 gal/room
Medical Buildings	MB	300 gal/1000 sq ft gross floor area
Motels	MB	150 gal/unit
Office Buildings	Off	200 gal/1000 sq ft gross floor area
Restaurants, cafeterias, etc.	R	50 gal/seat
Schools:		
Elementary or Jr. High	S	10 gal/student
High Schools	HS	15 gal/student
Universities or Colleges	U	20 gal/student
College Dormitories	CD	85 gal/student

*Multiply the average daily flow by 2.5 to obtain the peak flow

Zoning Coefficients

Zone	Coefficient (cfs/Acre)
Agriculture ---------------------------------	0.001
Residential*:	
R-1 ---	0.004
R-2 ---	0.008
R-3 ---	0.012
R-4 ---	0.016*
Commercial:	
C-1 through C-4 ---------------------------	0.015*
Heavy Industrial:	
M-1 through M-4 -------------------------	0.021*

* Individual building, commercial or industrial plant capacities shall be the determining factor when they exceed the coefficients shown
* Use 0.001 (cfs/unit) for condominiums only

2. SMD MAPS: N-1216 and N-1217

N-1216

A-68
A-87

THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

N
AUTOMATED GRAPHICS

METERS 0 50 100 200 250
0 200 400 600 800 FEET

LEGEND

CLAY SEWERS MAINTAINED BY SMD. 8" UNLESS OTHERWISE NOTED
PLASTIC SEWERS
CONCRETE SEWERS
CLAY SEWERS, LINED
CEMENT SEWERS, LINED
FORCE MAINS
SEWERS NOT MAINTAINED BY SMD
TRUNK SEWERS
CITY BOUNDARY
STANDARD MANHOLE
DROP MANHOLE
SHALLOW MANHOLE
TRAP MANHOLE
WEIR MANHOLE
C.O. CLEANOUT
L.H. LAMP HOLE
PUMP STATION

TOTAL MH'S THIS MAP: 250

MAP REV.
07-18-17

N-1216

MAP REV
07-18-17

DATA BASE REV
05-12-93

CONSOLIDATED S.M.D.

N-1216

T: 4459 G-5

2607.2609.1216

N-1217

A-65
A-68

SEE SHT. NO. N-1216

THIS MAP IS INTENDED FOR USE ONLY AS OPERATIONS MAP BY LOS ANGELES COUNTY SEWER MAINTENANCE DISTRICTS. LOS ANGELES COUNTY EXPRESSLY DISCLAIMS ANY LIABILITY FOR ANY INACCURACIES WHICH MAY BE PRESENT IN THIS MAP.

AUTOMATED GRAPHICS

METERS 0 50 100 200 250
0 200 400 600 800 FEET

LEGEND

- CLAY SEWERS MAINTAINED BY SMD. 8" UNLESS OTHERWISE NOTED
- PLASTIC SEWERS
- CONCRETE SEWERS
- CLAY SEWERS, LINED
- CEMENT SEWERS, LINED
- FORCE MAINS
- SEWERS NOT MAINTAINED BY SMD
- TRUNK SEWERS
- CITY BOUNDARY
- STANDARD MANHOLE
- DROP MANHOLE
- SHALLOW MANHOLE
- TRAP MANHOLE
- WEIR MANHOLE
- C.O. CLEANOUT
- L.H. LAMP HOLE
- PUMP STATION

TOTAL MH'S THIS MAP: 22

MAP REV.
07-18-17

N-1217

MAP REV
07-18-17

DATA BASE REV
05-12-93

CONSOLIDATED S.M.D.

N-1217

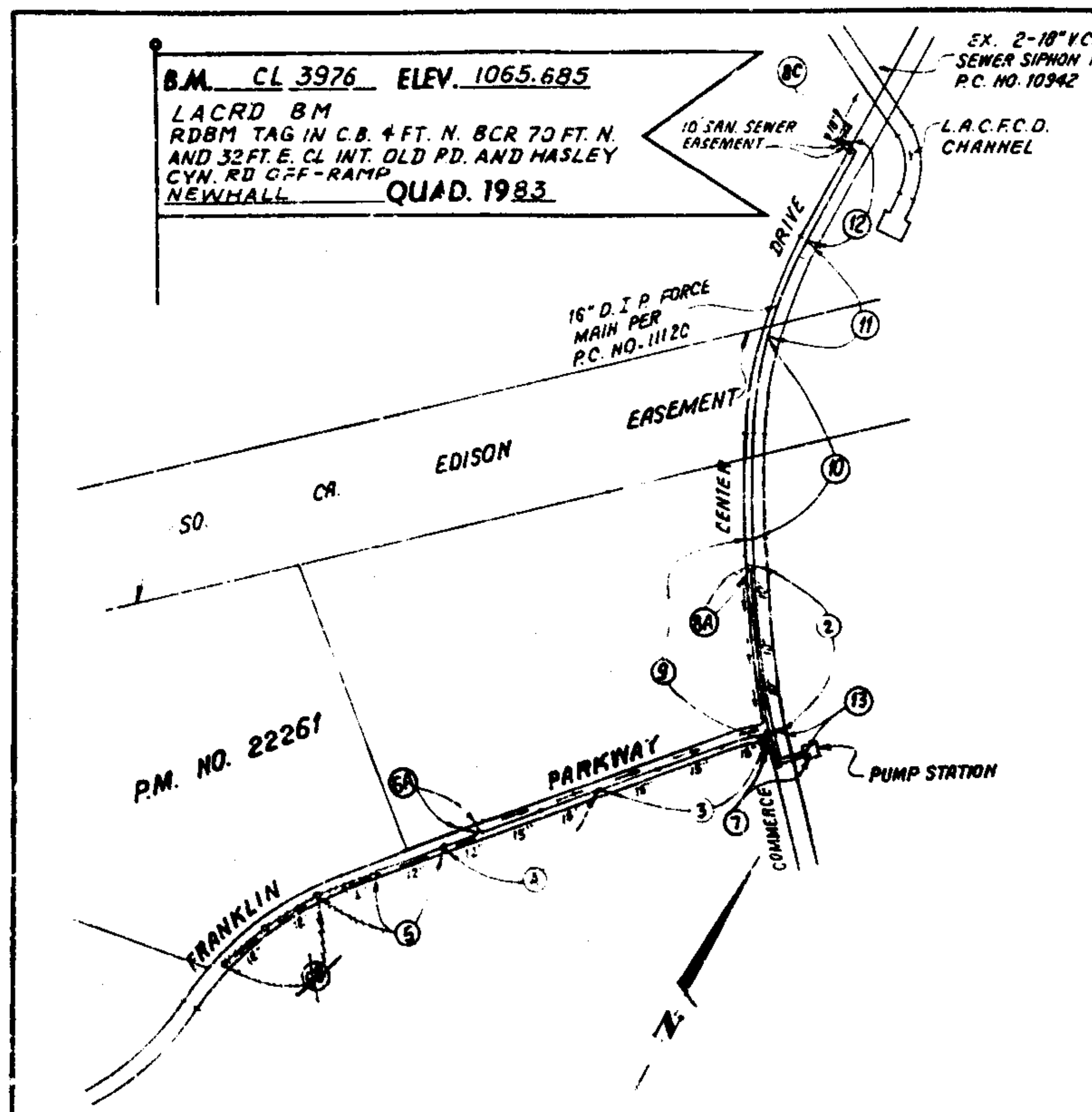
T: 4550 A-1

2607.2609.1217

3. EXISTING SEWER PLANS

DOUBLE SCALE

B.M. CL 3976 ELEV. 1065.685
LACRD BM
RDBM TAG IN C.B. 4 FT. N. BCR 70 FT. N. AND 32 FT. E. CL INT. OLD RD. AND HASLEY CYN. RD OFF-RAMP
NEWHALL QUAD. 1983



INDEX MAP
SCALE: 1" = 600'
P.C. 11120
PARCEL MAP NO. 22261
T.G. 123-D6
NOTE: NUMBERS IN CIRCLES INDICATE PAGE NUMBERS.

REVISION NO. 1 — DATE: 11-28-95
PAGE: 8 — ADDED THE NAME OF BLDG'S "A" & "B"
PAGES: — REVISED PUMPING BLDG. "A" & GENERATOR
10, 12, 13 BLDG. "B" FROM CONCRETE BLOCK TO
& 17 TILT-UP PANEL.
PAGES: — VOIDED
14, 15 & 19
PAGES: — ADDED SHEETS
14A, 15A
& 19A
APPROVED BY: Santiago G. Ibalio 3/20/96
OFFICE OF THE DIRECTOR OF PUBLIC WORKS

REVISION NO. 2 — DATE: 05-14-96
PAGE 1: REVISED KEY MAP.
PAGE 5: VOIDED THE SEWER LINE FROM STA. 22+20.00 TO STA. 25+50.00 ON PLAN & PROFILE. NO UPSTREAM SERVICE REQ'D.
PAGE 6B: VOIDED THE SEWER LINE ON PLAN & PROFILE. NO U/S SERVICE REQ'D.
APPROVED BY: Santiago G. Ibalio 9-9-96
OFFICE OF THE DIRECTOR OF PUBLIC WORKS — DATE

REVISION NO. 3 — DATE: 09-03-97
PAGE 12: REVISED M.H. @ STA. 41+50.00 FROM S.M.H. TO M.H.
APPROVED BY: Santiago G. Ibalio 10-01-97
OFFICE OF THE DIRECTOR OF PUBLIC WORKS — DATE

NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTEWATER DISCHARGE HAS BEEN ISSUED BY THE SANITATION DISTRICTS FOR SAID CONNECTION.

BEFORE BREAKING INTO OR CONSTRUCTION ON A COUNTY SANITATION DISTRICT SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, SANITATION DISTRICT INSPECTOR SHALL BE NOTIFIED BY PHONE (805) 266-4683 SO THAT REQUIRED INSPECTION CAN BE MADE.

GENERAL NOTES:

CONSTRUCTION NOTES:

PROFILE, ALIGNMENT AND GRADE OF

PAGE 1

SANITARY SEWERS

TO BE CONSTRUCTED IN

PARCEL MAP NO. 22261

PRIVATE CONTRACT NO. 11120

INDEX 1216
25 SHEETS; 31 PAGES

54362

SCALE: VERT. 1" = 8' — FEB., 1994

PREPARED IN THE OFFICES OF
SIKAND ENGINEERING ASSOC.
15230 BURBANK BLVD., (818) 787-8550
VAN NUYS, CA. 91411
BY Ronald K. Hayes
REG. C.E. NO. 16913

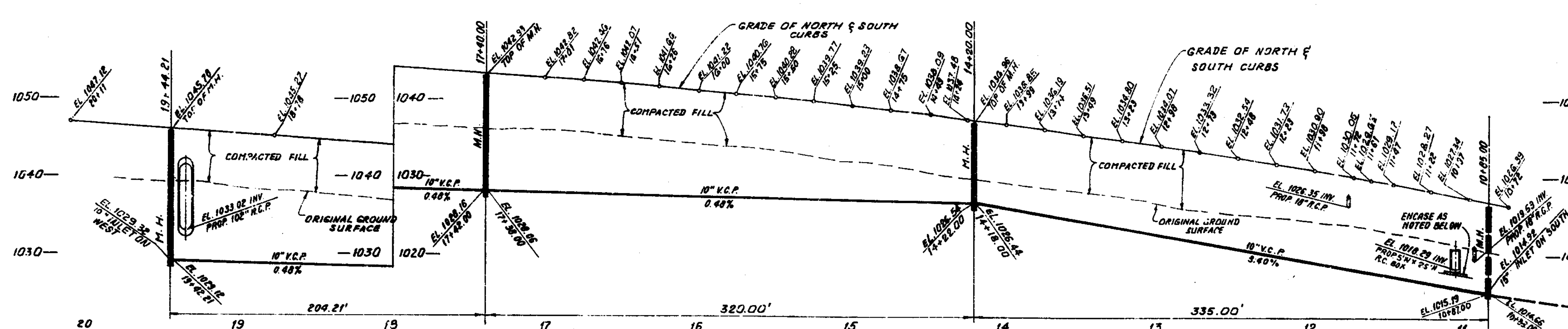
SEWER MANHOLE
CHIMNEY PIPE AND BASE
CONCRETE THRUST BLOCKS
REINFORCED PRECAST MANHOLE
30 INCH MANHOLE TYPE "C"

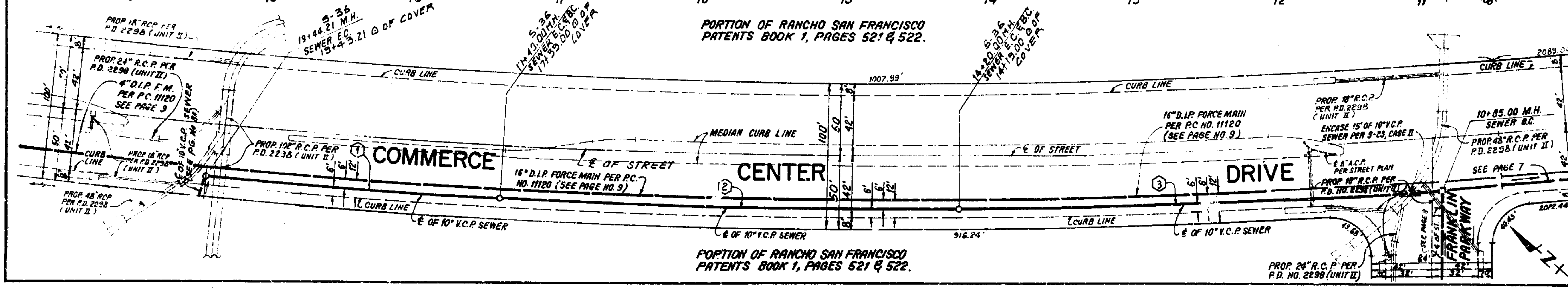
COUNTY OF LOS ANGELES, CALIFORNIA
HARRY W. STONE — ACTING DIRECTOR OF PUBLIC WORKS
CHARLES W. CARRY — CHIEF ENGINEER
APPROVED 5/9/94 — APPROVED 6-14-94
CHECKED Tom Hougland 5/9/94
20273
SANTA CLARITA VALLEY — 8.2

P.C. 11120 PAGE 2
REVIEWED BY: Santiago G. Ibalio — DATE 5/3/94

DOUBLE SCALE
NO L.A. COUNTY CHARGE FOR CONNECTION
SEE SAN. DISTRICTS FOR SPECIAL CONNECTION CHARGES
(310) 699-7411 EXT. 2714

54363





PORTION OF RANCHO SAN FRANCISCO PATENTS BOOK 1, PAGES 521 & 522.

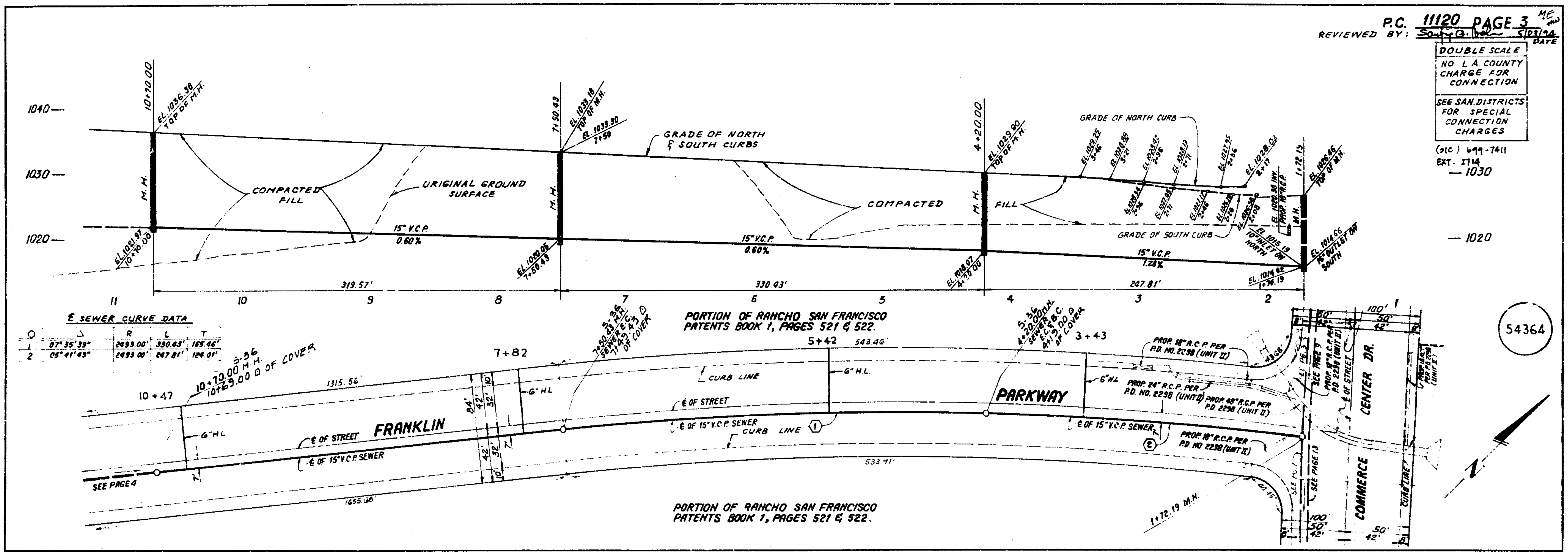
℄ SEWER CURVE DATA

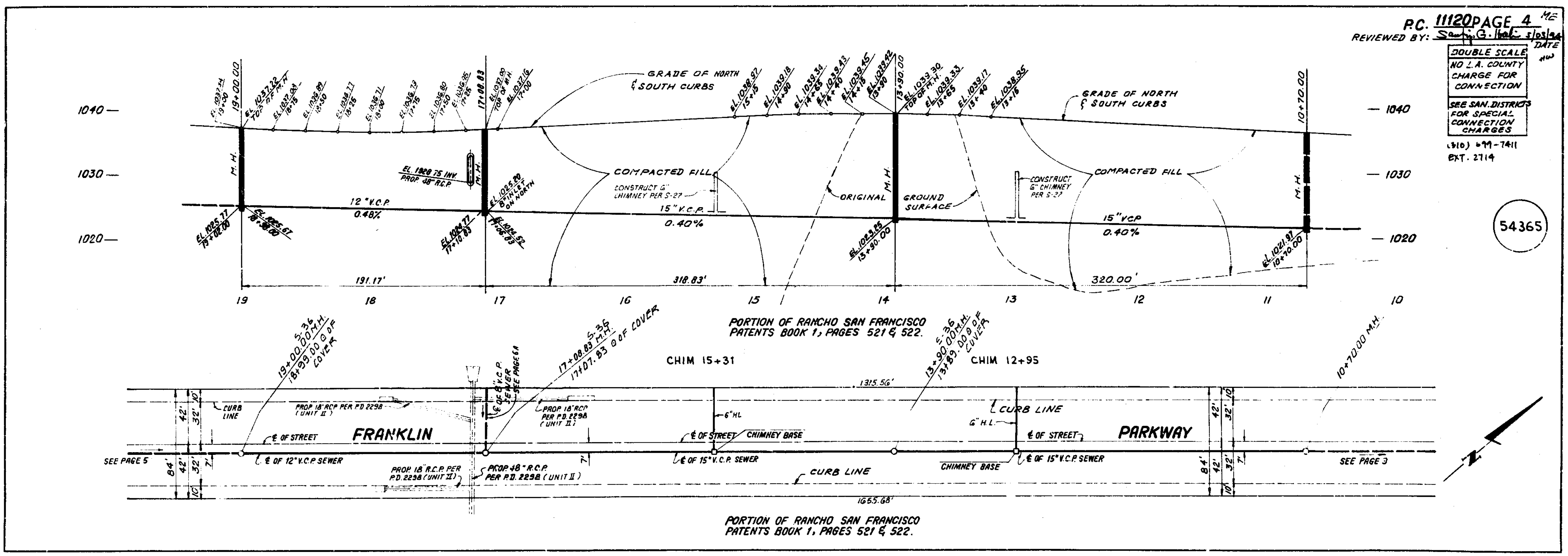
○	Δ	R	L	T
1	02°19'24"	5036.00'	204.21'	102.12'
2	03°38'27"	5036.00'	320.00'	160.05'
3	03°48'41"	5036.00'	335.00'	167.56'

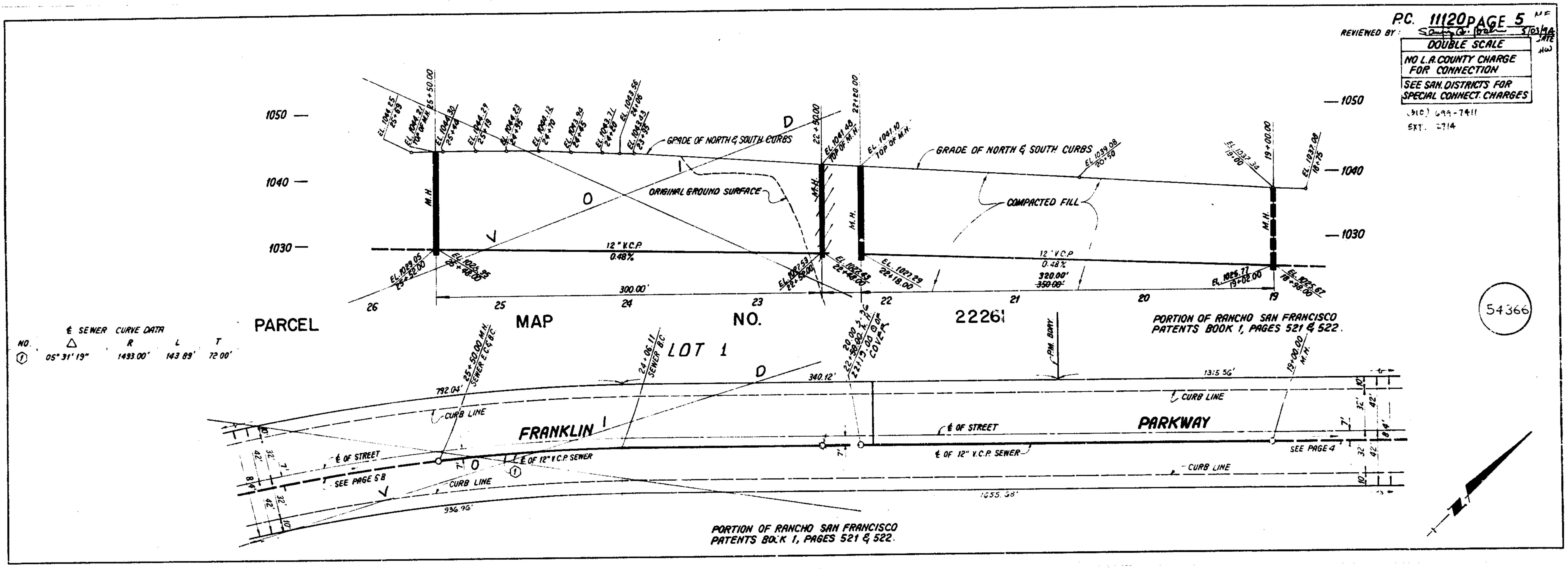
P.C. 11120

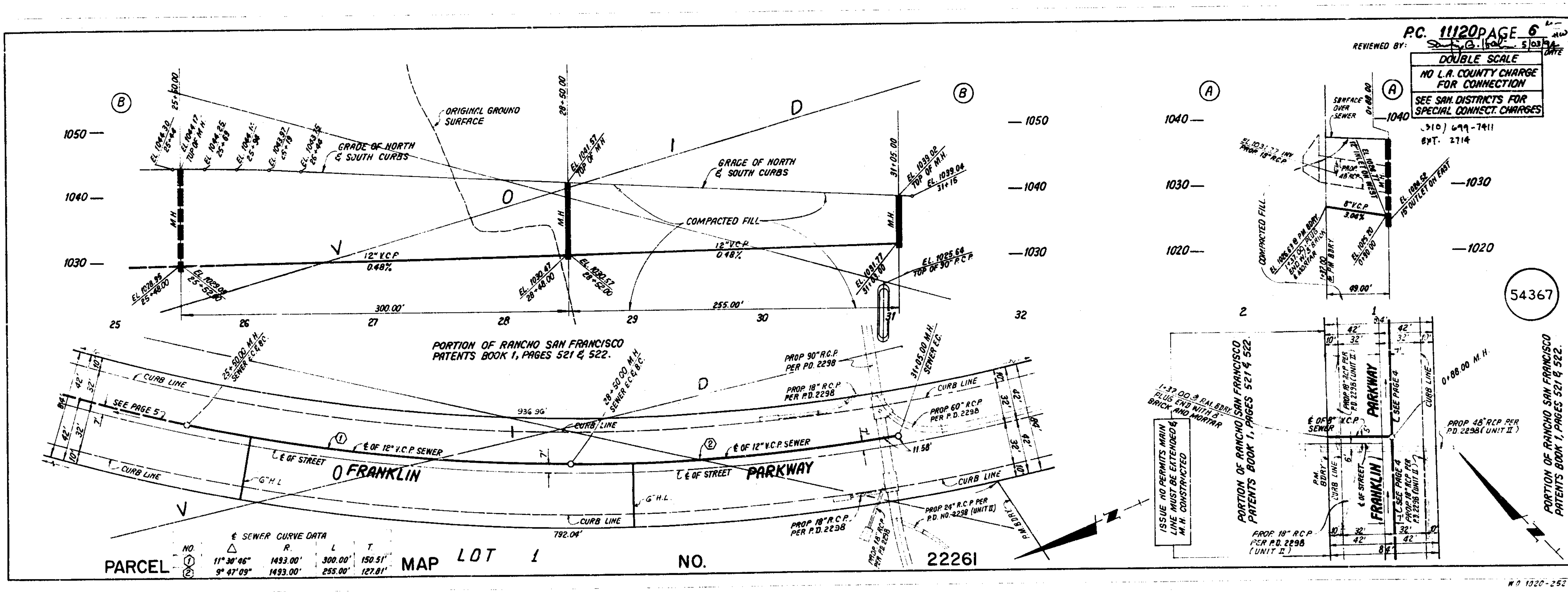
5

PM. 25531 PC. 11120









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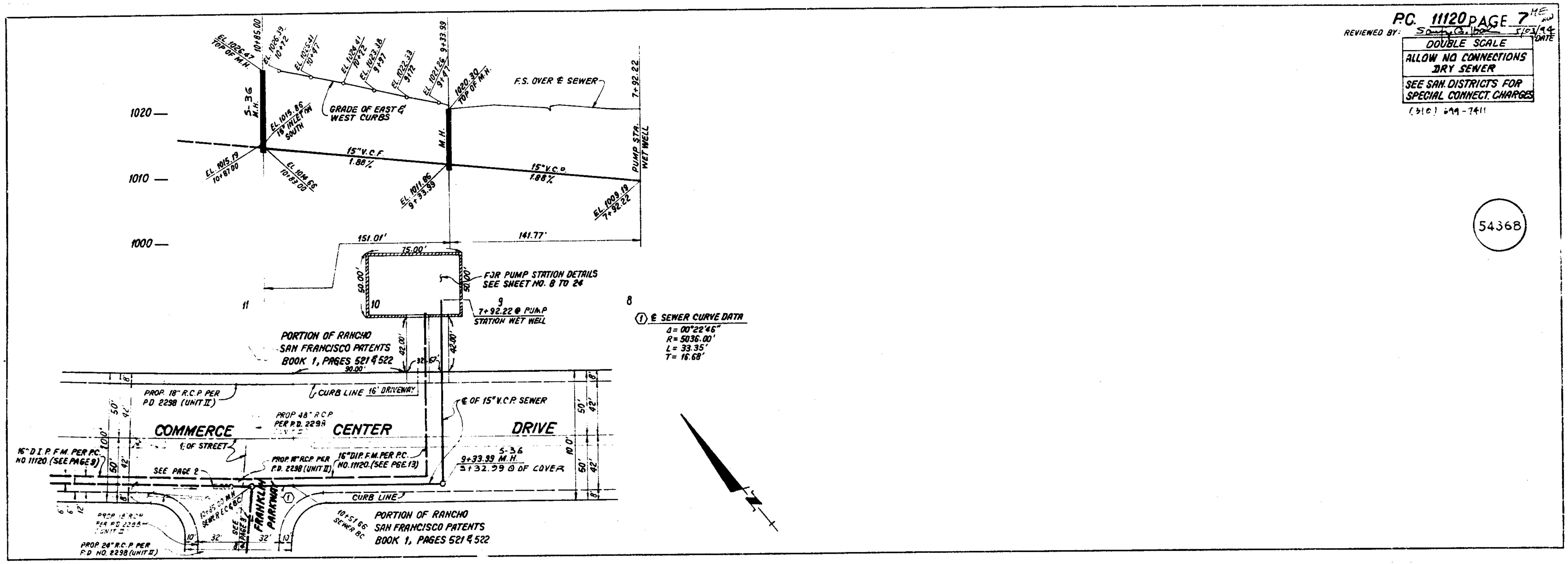

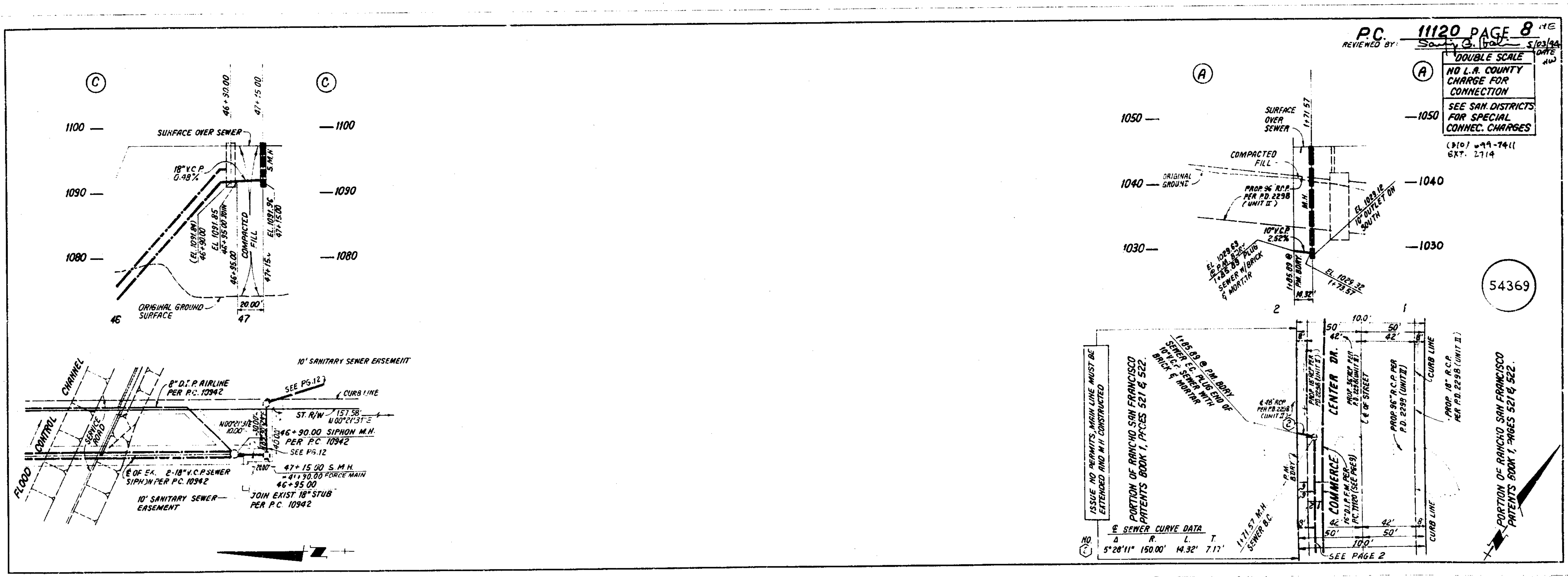

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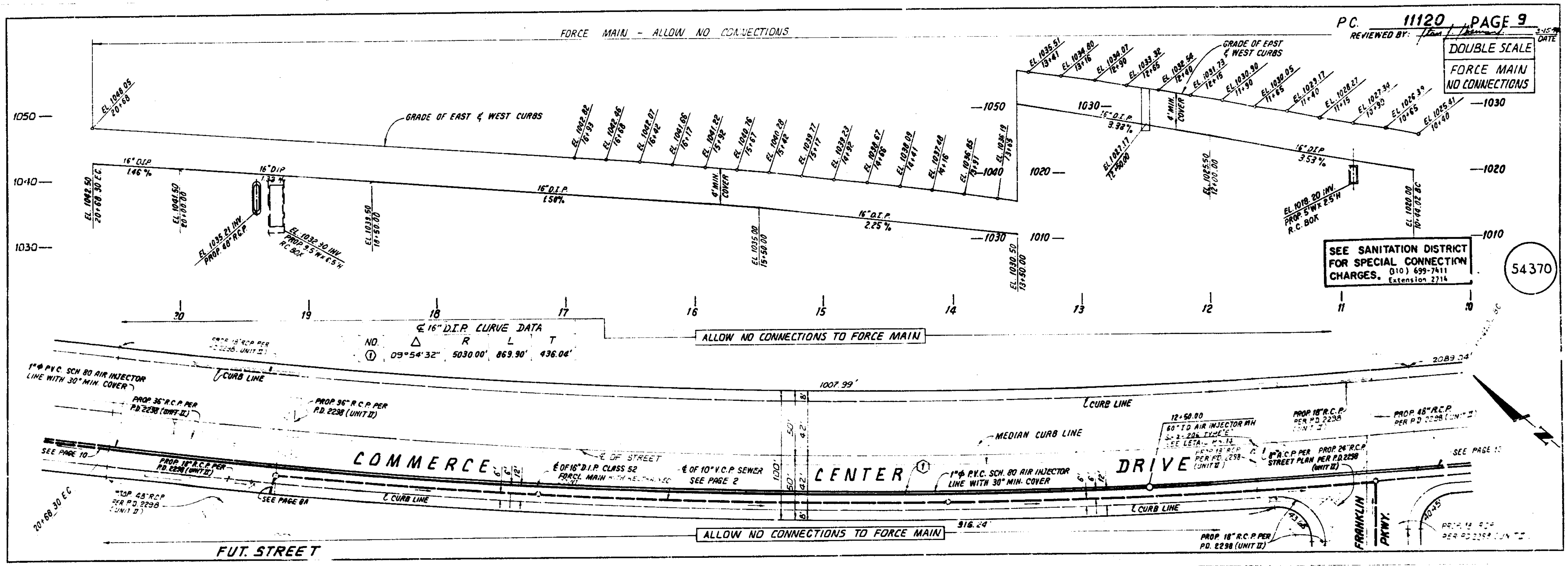

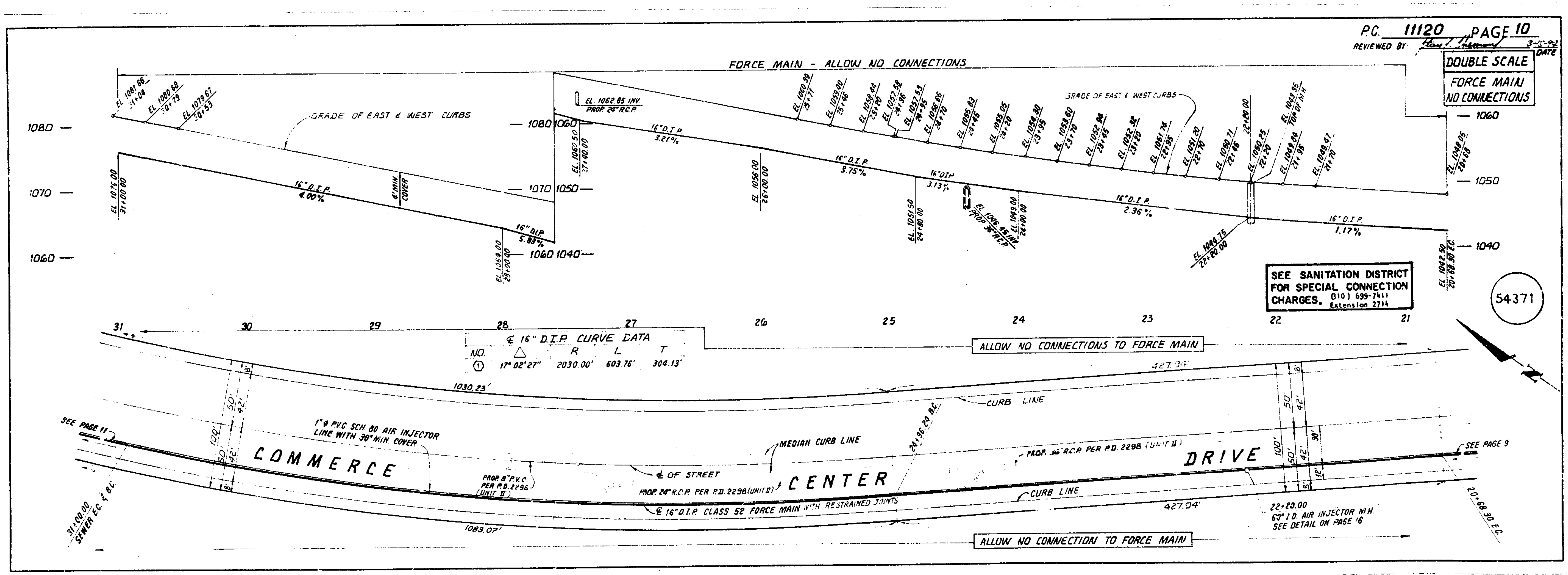

PW 2225 PC 11120

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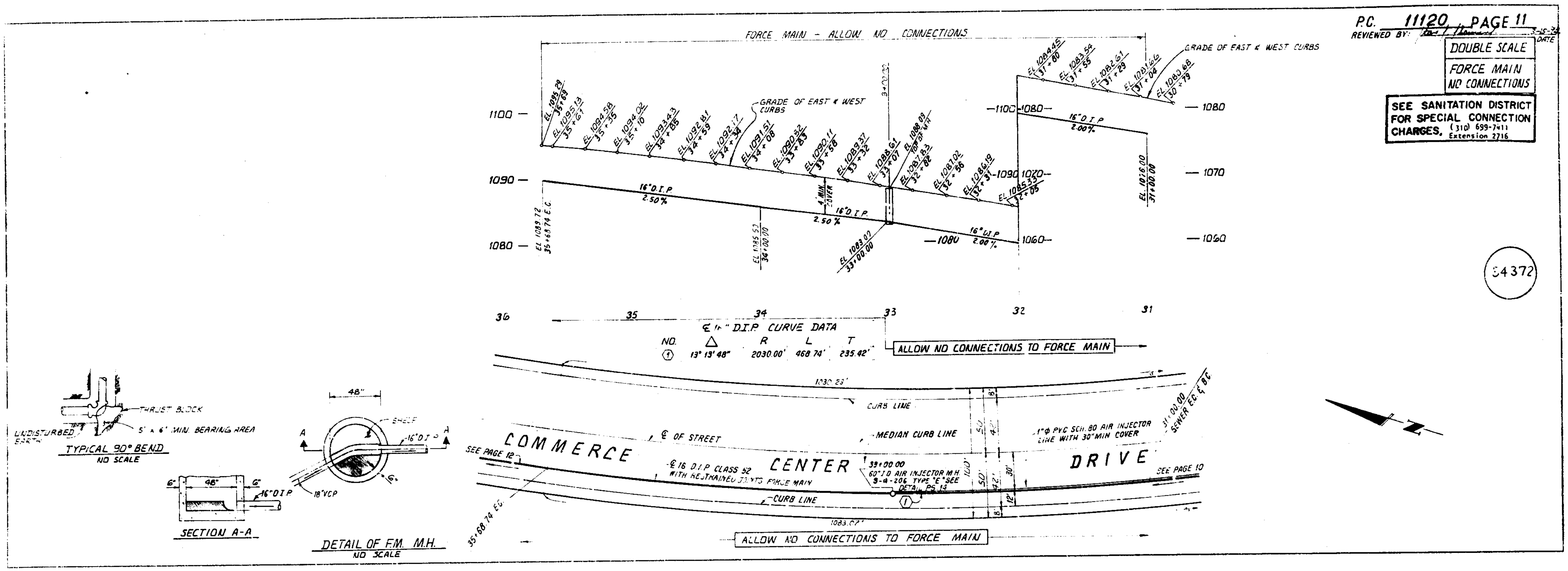
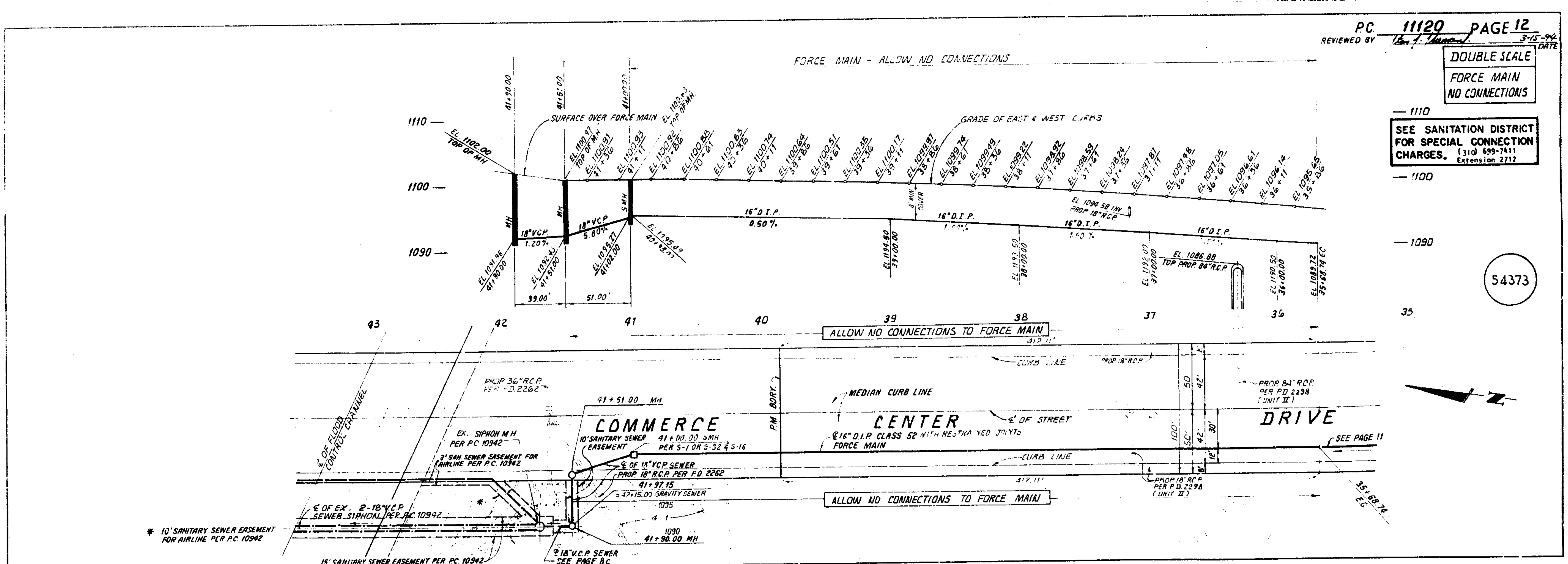


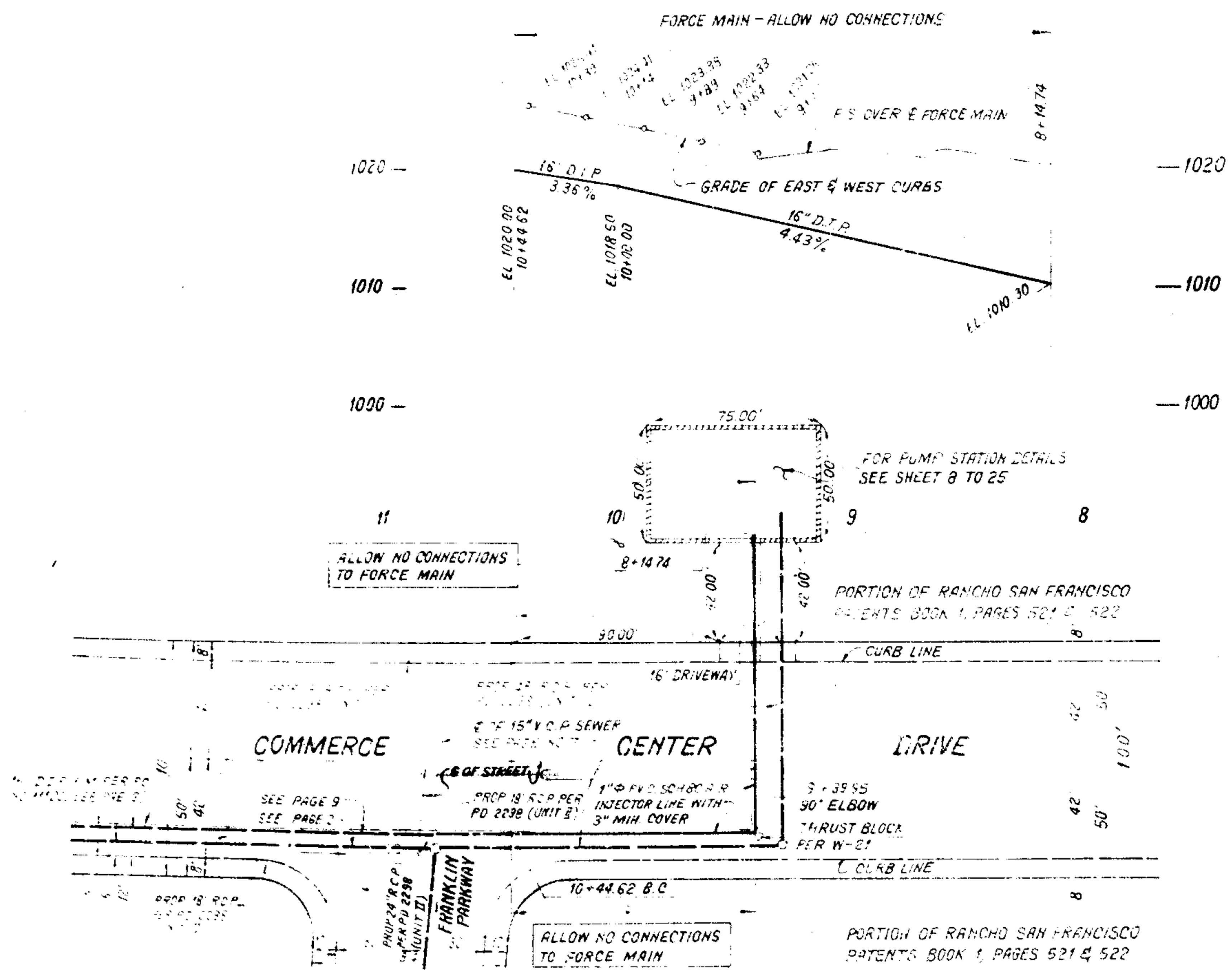


W.O. 1020-252-01

P.C. 11120 PAGE 13

DOUBLE SCALE
FORCE MAIN - ALLOW NO CONNECTIONS

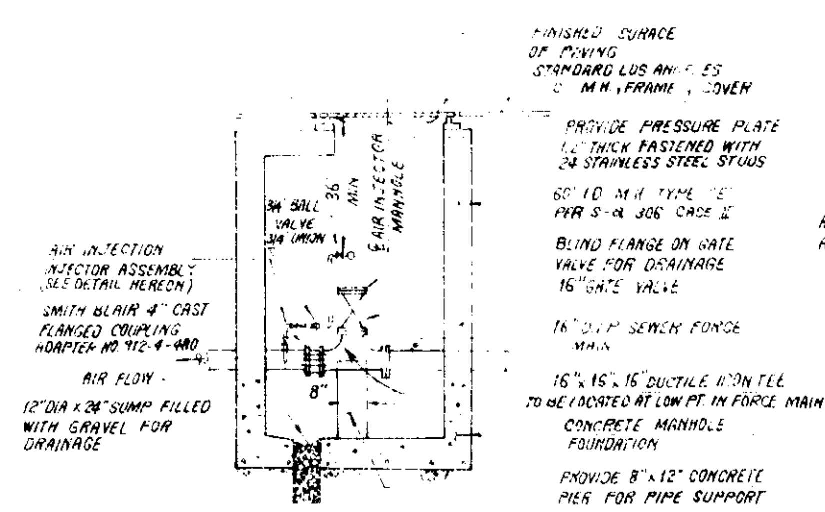
SEE SANITATION DISTRICT FOR SPECIAL CONNECTION CHARGES.



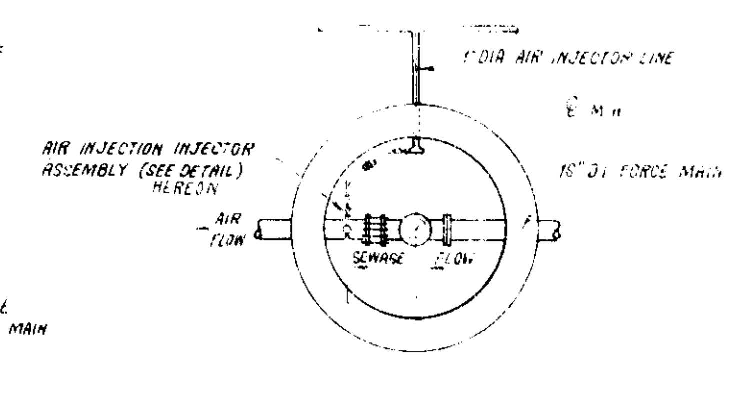
54374

P.C. 11120 PAGE 14

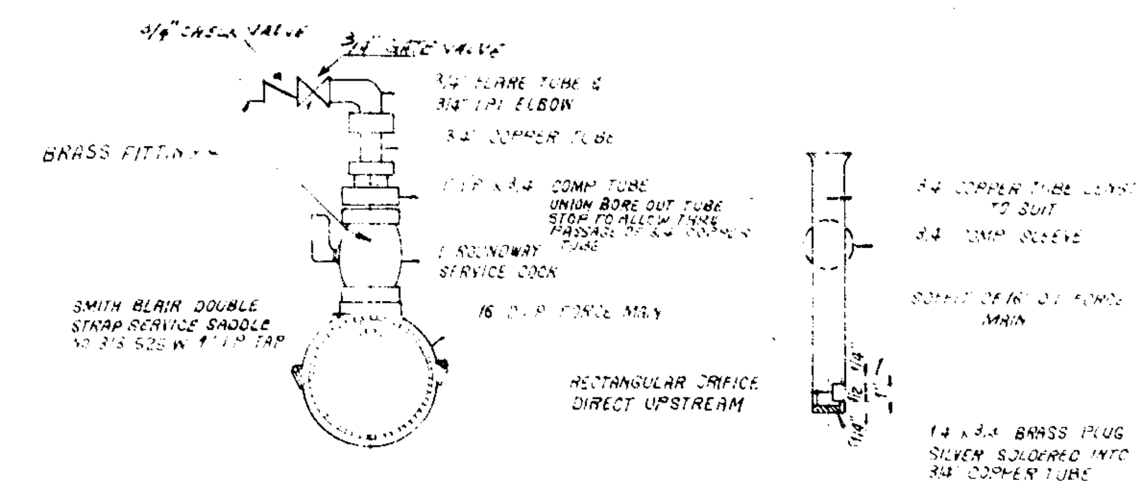
54375



SECTION THROUGH MANHOLE SHOWING DRAINAGE VALVE
NOT TO SCALE

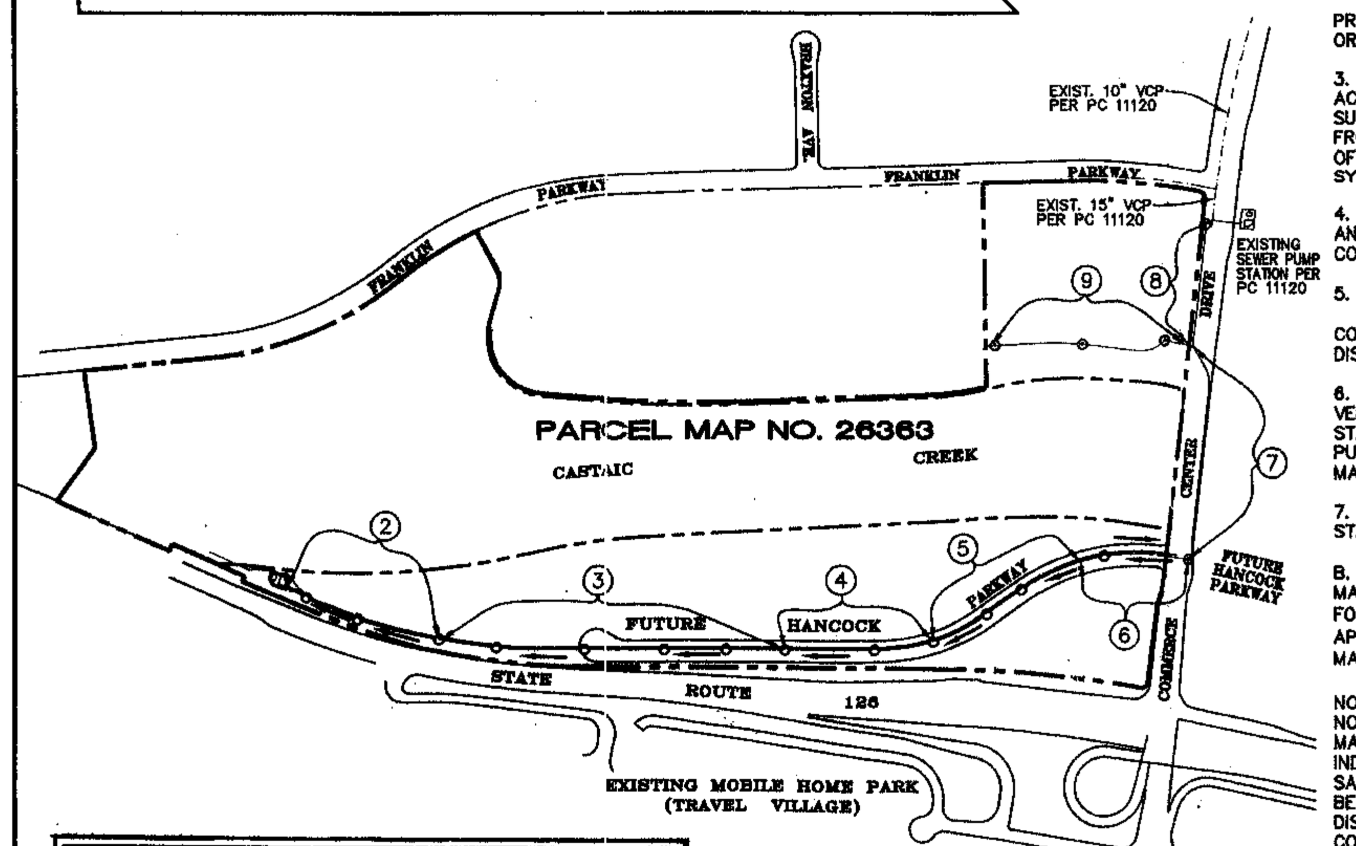


MANHOLE AIR DUCT DETAIL
NOT TO SCALE



AIR INJECTION INJECTOR ASSEMBLY
NOT TO SCALE

BENCHMARK: L5402
DESCRIPTION: RND HD SPK IN LOWER CONC. HDWL.
LOCATION: NORTH END 24 FT. W/O C.L. THE CLD ROAD (W RDWY) & 0.6 MI S/O HENRY MAYO DR. @ MI MKR #6.25
RECORDED FROM: NEWHALL QUAD.
ELEVATION: 1031.881   ADJ.: 2003



NOTE: SEE NOTE ON PAGE 8 FOR CONNECTION TO PC 11120

SEWER VIDEO OF ALL SEGMENTS, FINAL MAP AND AS-BUILT SEWER PLANS SHALL BE SUBMITTED PRIOR TO PARTIAL FIELD ACCEPTANCE

INDEX MAP

SCALE: 1" = 600' INDEX 1217
P.C. 11645 P.M. NO. 26363
THOMAS GUIDE PAGE: 4549 / G-1

NOTES: NUMBER IN CIRCLE INDICATES PAGE NUMBER. ALL MAINLINE SANITARY SEWERS ARE WITHIN THE SANITARY SEWER EASEMENT

ISSUE NO LATERAL CONNECTION PERMITS UNTIL OUTLET PUMP STATION PC 11645 PS IS ACCEPTED FOR PUBLIC USE.

BUILDING AND SAFETY OFFICE: SANTA CLARITA

NO.	REVISION	REVISED BY	APPROVED BY	DATE

STORMWATER POLLUTION PLAN NOTES

A. NOTES

1. ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ON SITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEETFLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES OR WIND.

2. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER.

3. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MUST BE CLEANED UP IMMEDIATELY AND DISPOSED OF IN A PROPER MANNER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM.

4. EXCESS OR WASTE CONCRETE MAY NOT BE WASHED INTO THE PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS SHALL BE MADE TO RETAIN. CONCRETE WASTES ON SITE UNTIL THEY CAN BE DISPOSED OF AS SOLID WASTE.

5. TRASH AND CONSTRUCTION RELATED SOLID WASTES MUST BE DEPOSITED INTO A COVERED RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND.

6. SEDIMENTS AND OTHER MATERIALS MAY NOT TRACKED FROM THE SITE BY VEHICLE TRAFFIC. THE CONSTRUCTION ENTRANCE ROADWAYS MUST BE STABILIZED SO AS TO INHIBIT SEDIMENTS FROM BEING DEPOSITED INTO THE PUBLIC WAY. ACCIDENTAL DEPOSITIONS MUST BE SWEPT UP IMMEDIATELY AND MAY NOT BE WASHED DOWN BY RAIN OR OTHER MEANS.

7. ANY SLOPES WITH DISTURBED SOILS DENUDED OF VEGETATION MUST BE STABILIZED SO AS TO INHIBIT EROSION BY WIND AND WATER.

B. THE FOLLOWING BMPs AS OUTLINED IN, BUT NOT LIMITED TO, THE "BEST MANAGEMENT PRACTICE HANDBOOK, CALIFORNIA STORMWATER QUALITY TASK FORCE, SACRAMENTO, CALIFORNIA 2003," OR THE LATEST REVISED EDITION, MAY APPLY DURING THE CONSTRUCTION OF THIS PROJECT (ADDITIONAL MEASURES MAY BE REQUIRED IF DEEMED APPROPRIATE BY COUNTY INSPECTORS):

NOTES:
NO CONNECTION FOR THE DISPOSAL OF INDUSTRIAL WASTES SHALL BE MADE TO SEWERS SHOWN ON THESE DRAWINGS UNTIL A PERMIT FOR INDUSTRIAL WASTE WATER DISCHARGE HAS BEEN ISSUED BY THE COUNTY SANITATION DISTRICTS FOR SAID CONNECTIONS.
BEFORE BREAKING INTO OR CONSTRUCTING A COUNTY SANITATION DISTRICTS SEWER AND PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, A COUNTY SANITATION DISTRICTS INSPECTOR SHALL BE NOTIFIED BY PHONE AT (661) 727-5320 SO THAT REQUIRED INSPECTION CAN BE MADE.

STANDARD PLANS:
THE FOLLOWING LATEST REVISED STANDARD PLANS ON FILE IN THE OFFICE OF THE FOLLOWING DEPARTMENT SHALL APPLY IN THE CONSTRUCTION OF THIS PROJECT.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

- 2000-0 LEGEND FOR SANITARY SEWER PLANS AND PROFILES AND DISTRICT MAPS.
- 2002-1 PRECAST CONCRETE SHALLOW MANHOLE
- 2003-2 REINFORCED PRECAST CONCRETE MANHOLE
- 2014-1 RECTANGULAR MANHOLE FRAME AND COVER
- 2015-1 STANDARD MANHOLE STEP
- 2021-1 BEDDING FOR SEWER PIPE
- 2023-2 CRADLING AND ENCASEMENT
- 2024-1 WYE OR TEE SUPPORT
- 2026-1 EROSION PROTECTION IN STEEP SLOPES
- 2027-1 ALLOWABLE TRENCH WIDTHS
- 6008-1 MINIMUM PUBLIC SAFETY REQUIREMENTS

AMERICAN PUBLIC WORKS ASSOCIATION

- 207-1 PRECAST REINFORCED CONCRETE MANHOLE BASE
- 208-1 BREAKING INTO EXISTING MANHOLES
- 210-2 MANHOLE FRAME AND COVER LOCKING TYPE
- 220-2 CHIMNEYS
- 221-1 PIPE ANCHORS AND BACKFILL STABILIZERS
- 222-1 HOUSE CONNECTION SEWER
- 223-1 HOUSE CONNECTION REMODELING

EROSION CONTROL
- EC1 – SCHEDULING
- EC2 – PRESERVATION OF EXISTING VEGETATION
- EC3 – HYDRAULIC MULCH
- EC4 – HYDROSEEDING
- EC5 – SOIL BINDERS
- EC6 – STRAW MULCH
- EC7 – GEOTEXTILES, PLASTIC COVERS, & EROSION CONTROL BLANKETS/MATS
- EC8 – WOOD MULCHING
- EC9 – EARTH DIKES/DRAINAGE SWALES & LINED DITCHES
- EC10 – OUTLET PROTECTION/VELOCITY DISSIPATION DEVICES
- EC11 – SLOPE DRAINS
- EC12 – STREAMBANK STABILIZATION
- EC13 – POLYACRYLAMIDE

TEMPORARY SEDIMENT CONTROL
- SE1 – SILT FENCE
- SE2 – SEDIMENT/DESILTING BASIN
- SE3 – SEDIMENT TRAP
- SE4 – CHECK DAM
- SE5 – FIBER ROLLS
- SE6 – GRAVEL BAG BERM
- SE7 – STREET SWEEPING AND VACUUMING
- SE8 – SANDBAG BARRIER
- SE9 – STRAW BALE BARRIER
- SE10 – STORM DRAIN INLET PROTECTION
- SE11 – CHEMICAL TREATMENT

WIND EROSION CONTROL
- WE1 – WIND EROSION CONTROL

EQUIPMENT TRACKING CONTROL
- TR1 – STABILIZED CONSTRUCTION ENTRANCE/EXIT
- TR2 – STABILIZED CONSTRUCTION ROADWAY
- TR3 – ENTRANCE/OUTLET TIRE WASH

WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL
- WM1 – MATERIAL DELIVERY AND STORAGE
- WM2 – MATERIAL USE
- WM3 – STOCKPILE MANAGEMENT
- WM4 – SPILL PREVENTION AND CONTROL
- WM5 – SOLID WASTE MANAGEMENT
- WM6 – HAZARDOUS WASTE MANAGEMENT
- WM7 – CONTAMINATED SOIL MANAGEMENT
- WM8 – CONCRETE WASTE MANAGEMENT
- WM9 – SANITARY/SEPTIC WASTE MANAGEMENT
- WM10 – LIQUID WASTE MANAGEMENT

NON-STORMWATER MANAGEMENT
- NS1 – WATER CONSERVATION PRACTICES
- NS2 – DEWATERING OPERATIONS
- NS3 – PAVING AND GRINDING OPERATIONS
- NS4 – TEMPORARY STREAM CROSSING
- NS5 – CLEAR WATER DIVERSION
- NS6 – ILLICIT CONNECTION/ILLEGAL DISCHARGE DETECTION AND REPORTING
- NS7 – POTABLE WATER/IRRIGATION
- NS8 – VEHICLE AND EQUIPMENT CLEANING
- NS9 – VEHICLE AND EQUIPMENT FUELING
- NS10 – VEHICLE AND EQUIPMENT MAINTENANCE
- NS11 – PILE DRIVING OPERATIONS
- NS12 – CONCRETE CURING
- NS13 – MATERIAL AND EQUIPMENT USE OVER WATER
- NS14 – CONCRETE FINISHING
- NS15 – STRUCTURE DEMOLITION/REMOVAL OVER OR ADJACENT TO WATER
- NS16 – TEMPORARY BATCH PLANTS

NOTE:

FOR 18" DUCTILE IRON GRAVITY SEWER PIPING
18" DIAMETER GRAVITY SEWER SHALL BE DUCTILE IRON PIPE AND FITTINGS, MINIMUM CLASS 350.
JOINTS SHALL BE TR FLEX RESTRAINED JOINTS FOR ALL BURIED PIPE AND FITTINGS, OR EQUIVALENT. FOR ABOVE GROUND PIPING SUCH AS WHEN CROSSING THE COMMERCE CENTER DRIVE BRIDGE, JOINTS SHALL BE BOLTLESS RESTRAINED JOINTS SUCH AS THE TR FLEX JOINT SYSTEM, OR EQUIVALENT.

INTERNAL LINING OF PIPE AND FITTINGS SHALL BE PROTECTO 401 CERAMIC EPOXY BY US PIPE FACTORY APPLIED TO A NOMINAL THICKNESS OF 40 MILS, OR APPROVED EQUIVALENT. EACH PIECE OF PIPE AND EVERY FITTING SHALL BE HOLIDAY TESTED AND THICKNESS TESTED AT THE FACTORY AND CERTIFIED IN WRITING TO THE OWNER BY THE FACTORY TO BE HOLIDAY-FREE AND IN COMPLIANCE WITH THE NOMINAL THICKNESS REQUIREMENT.

EXTERNAL COATING SHALL BE STANDARD FACTORY BITUMINOUS COATING OF 2 MILS THICKNESS. ALL BURIED PIPE AND FITTING SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C105.

PRIVATE CONTRACT SEWER GENERAL NOTES

THE FOLLOWING GENERAL NOTES ARE TO BE INCLUDED ON PAGE 1 OF ALL PRIVATE CONTRACT SEWER PLANS:

1. A SEWER CONSTRUCTION PERMIT SHALL BE OBTAINED AND A FEE PAID FOR CONSTRUCTION INSPECTION AND RECORD PLANS TO THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORK, CITY ENGINEER FOR THE CITY OF ________ AT THE PERMIT COUNTER, 900 SOUTH FREMONT AVENUE, 8TH FLOOR, ALHAMBRA, AT LEAST 72 HOURS PRIOR TO STARTING WORK UNDER THIS PERMIT. COPIES OF ALL REQUIRED PERMITS, SUCH AS ROAD EXCAVATION, CALTRANS, ECT., MUST BE FILED WITH THE PERMIT APPLICATION.
2. PRIOR TO ISSUANCE OF ANY PERMIT, THE CONTRACTOR SHALL FILE A PERMIT FOR EXCAVATIONS AND TRENCHES FROM THE STATE OF CALIFRONIA DIVISION OF INDUSTRIAL SAFETY, AND A CERTIFICATE OF WORKER'S COMPENSATION INSURANCE WITH THE DEPARTMENT OF PUBLIC WORKS NAMED AS THE CERTIFICATE HOLDER. THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS, CITY ENGINEER FOR THE CITY OF ________ SHALL BE NOTIFIED 30 DAYS PRIOR TO CANCELLATION OF THE INSURANCE POLICY.
3. IF WORK IS DONE IN A STATE HIGHWAY, A PERMIT MUST BE OBTAINED FROM THE STATE OF CALIFORNIA DIVISION OF HIGHWAYS, 120 SOUTH SPRING STREET, LOS ANGELES, CALIFORNIA.
4. WHEN WORK IS WITHIN A CONTRACT CITY, THE CONTRACTOR MUST CONTACT THE DIRECTOR OF PUBLIC WORKS OF THAT CITY, TO DETEMINE THE LOCATION TO PAY THE INSPECTION FEE.
5. THE CONTRACTOR SHALL CONTACT THE DISTRICT OFFICE LISTED ON THE "APPLICATION FOR CONSTRUCTION PERMIT" TO ARRANGE FOR AN ACCEPTABLE CONSTRUCTION START DATE.
6. APPROVAL OF THIS PLAN BY THE COUNTY OF LOS ANGELES, CITY ENGINEER FOR THE CITY OF ________ DOES NOT CONSTITUTE A REPRESENTATION AS TO ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NON-EXISTENCE OF ANY UNDERGROUND UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THIS NOTE COMPLIES TO ALL PAGES.
7. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", INCLUDING SUPPLEMENTS (IF THERE IS ANY), THE LATEST "ADDITIONS AND AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" AND THE "SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWER" AND SHALL BE PROSECUTED ONLY IN THE PRESENCE OF THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS.
8. THE CONTRACTOR'S ATTENTION IS DIRECTED TO SECTION 7-10.4.1 OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" IN REGARD TO SAFETY ORDERS AND SHALL CONFORM TO THE "MINIMUM PUBLIC SAFETY REQUIREMENT" AS SHOWN ON LOS ANGELES DEPARTMENT OF PUBLIC WORKS' STANDARD PLAN 6008-1.
9. ELEVATIONS ARE IN FEET ABOVE U.S.C. & G.S. SEA LEVEL DATUM OF 1988.
10. NO REVISIONS SHALL BE MADE IN THESE PLANS WITHOUT THE APPROVAL OF THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS, CITY ENGINEER FOR THE CITY OF SANTA CLARITA.
11. NO REPRESENTATIVE OF THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS, CITY ENGINEER FOR THE CITY OF SANTA CLARITA WILL SURVEY OR LAY OUT ANY PORTION OF THE WORK.
12. GRADES TO WHICH THIS IMPROVEMENT IS TO BE CONSTRUCTED ARE SHOWN ON PLANS AND PROFILES. GRADE POINTS FOR TOP OF CURBS, CENTERLINE OF STREETS, OR CENTERLINE OF ALLEYS, ARE SHOWN BY CIRCLES ON PROFILES AT ALL POINTS BETWEEN SAID DESIGNED POINTS. THE GRADE SHALL BE ESTABLISHED SO AS TO CONFORM TO A STRAIGHT LINE DRAWN BETWEEN SAID DESIGN POINTS.
13. THE PRIVATE ENGINEER SHALL FURNISH THE COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS, CITY ENGINEER FOR THE CITY OF SANTA CLARITA WITH GRADE SHEETS AND STATIONING FOR ALL HOUSE LATERALS AND "Y" OR "T" BRANCHES AND SHALL PROVIDE STAKES FOR THEM AT THEIR PROPER LOCATIONS WITH STATIONING PLAINLY MARKED. ALL HOUSE LATERALS SHALL BE CONSTRUCTED IN A STRAIGHT ALIGNMENT AT RIGHT ANGLES FROM THE MAIN LINE SEWER EXCEPT AS SHOWN ON THE PLANS. HOUSE LATERALS FROM CHIMNEYS SHALL NOT HAVE AN ANGLE OF LESS THAN 45 DEGREES WITH THE M.L. SEWER. ANY CHANGE IN ALIGNMENT SHALL BE REQUESTED IN WRITING BY THE PRIVATE ENGINEER.
14. THE PRIVATE ENGINEER SHALL FURNISH THE HOUSE LATERAL DEPTH AT THE PROPERTY LINE BELOW THE TOP OF CURB ELEVATION FOR EACH HOUSE LATERAL ON THE GRADE SHEET.
15. AN APPROVED BACKWATER VALVE IS REQUIRED WHEN THE PAD IS LOWER IN ELEVATION THAN THE TOP OF THE NEXT UPSTREAM MANHOLE.

CONSTRUCTION NOTES

1. PROVIDE SURVEY STAKES ON THE PROPERTY LINE OR PROPERTY LINES PRODUCED AT RIGHT ANGLES TO THE SEWER LINE AT THE CENTERLINE OF EACH MANHOLE.
2. VITRIFIED CLAY PIPE JOINTS SHALL BE TYPE "D" OR "G" PER "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" SECTION 208-2.
3. IF A POWERPOLE IS WITHIN THREE FEET OF THE SEWER, THE SEWER SHALL BE ENCASED PER LACDPW STANDARD PLAN 2023-2, CASE II, TWO FEET ON EACH SIDE FROM THE POINT OF INTERFERENCE.
4. ALL JOINTS BETWEEN CAST IRON PIPE AND VITRIFIED CRALY SHALL BE MADE WITH A RUBBER SLEEVE JOINT, TYPE "D" (WITH BUSHING IF NECESSARY) PER "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" SECTION 208-2.
5. HOUSE LATERALS TO BE CONSTRUCTED WITH INVERTS AT THE PROPERTY LINE 6 FEET BELOW CURB GRADE EXCEPT AS NOTED.
6. WYE OR TEE BRANCHES MAY BE USED FOR CONNECTIONS TO THE MAINLINE SEWERS EXCEPT AS NOTED.
7. IF DURING THE COURSE OF CONSTRUCTION, IT IS DETERMINED THAT THERE IS LESS THAN FOUR FEET OF COVER OVER THE TOP OF A MAINLINE OR HOUSE LATERAL V.C.P. SEWER WHICH IS NOT INDICATED ON THE PLANS, THE PIPES SHALL BE ENCASED PER LACDPW STANDARD PLAN 2023-2, CASE II, UNLESS OTHERWISE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
8. ALL STRUCTURES SHALL BE EITHER BRICK SEWER MANHOLES PER LACDPW STANDARD PLAN S-3 (APWA 203-0), OR PRECAST CONCRETE SEWER MANHOLES PER LACDPW STANDARD PLAN S-36 (APWA 200-2), OR REINFORCED PRECAST CONCRETE MANHOLE PER LACDPW STANDARD PLAN 2003-2, EXCEPT AS NOTED.
9. RESURFACE ALL TRENCHES WITHIN PAVED AREAS TO MEET DEPARTMENT OF PUBLIC WORKS OR CALTRANS REQUIREMENTS IN ACCORDANCE WITH THE PERMITS.
10. FULL COMPLIANCE WITH SECTION 306-1.3.4 OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" WILL BE REQUIRED FOR BACKFILL IN STREET. CERTIFICATION OF BACKFILL, COMPACTION, AND SAND EQUIVALENTS BY A QUALIFIED CIVEL ENGINEER SHALL BE PROVIDED BY THE PERMITEE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF PARTIAL ACCEPTANCE.
11. ALL BACKFILL AND FILLS OUTSIDE OF THE STREET RIGHT OF WAY SHALL BE COMPACTED TO 90% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM SOIL COMPACTION TEST D 1557-78 METHOD "D' UNLESS OTHERWISE SPECIFIED. THIS SHALL BE CERTIFIED BY A QUALIFIED CIVIL ENGINEER. THIS CERTIFICATION SHALL BE SUBMITTED TO THE CONSTRUCTION DIVISION OF THE DEPARTMENT OF PUBLIC WORKS PRIOR TO THE ACCEPTANCE OF THE WORK BY THE COUNTY.
12. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE SIX INCHES ABOVE FINISHED GRADE.
13. SEWERS TO BE TESTED FOR LEAKAGE PER SECTION 306-1.4 OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" AND "SPECIAL PROVISIONS FOR THE CONSTRUCTION OF SANITARY SEWER".
14. MANHOLE TOPS IN UNIMPROVED RIGHTS OF WAY TO BE LEVEL WITH FINISHED GRADE.
15. ALL WYES AND/OR HOUSE LATERALS ARE TO BE LOCATED AT LEAST 5' APART AND WHEN POSSIBLE NOT CLOSER THAN 5' TO ANY MANHOLE.

PROFILE, ALIGNMENT, AND GRADE OF

SANITARY SEWERS

TO BE CONSTRUCTED IN

PARCEL MAP 26363 PC NO. 11645
13 SHEETS: 17 PAGES
COUNTY OF LOS ANGELES CALIFORNIA
INDEX 1217

DONALD L. WOLFE DIRECTOR OF PUBLIC WORKS
APPROVED BY LAND DEVELOPMENT DIVISION
BY ________ ASSISTANT DIVISION ENGINEER 10/25/07 DATE
SUBMITTED BY ________ SEWER AND WATER/LANDSCAPE SECTION 10/25/07 DATE

SANTA CLARITA VALLEY SANITATION DISTRICT
OF LOS ANGELES COUNTY, CALIFORNIA
STEPHEN R. MAGUIN - CHIEF ENGINEER AND GENERAL MANAGER
APPROVED BY: ________ for OFFICE ENGINEER DATE: 10/25/07

PRIVATE ENGINEERS NOTICE TO CONTRACTORS:

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS IS REQUIRED BY A SEARCH OF AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE. THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP. THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING. PRIOR TO EXCAVATION THE CONTRACTOR SHALL CALL TOLL FREE 1-800-422-4133 TO VERIFY THE UNDERGROUND LOCATION OF GAS AND TELEPHONE LINES. THE CONTRACTOR SHALL ALSO CALL MR. RAY CUMMINGS OF GENERAL TELEPHONE COMPANY AT 1-805-948 4871 SO THAT THEY CAN MARK THE LOCATION OF UNDERGROUND TELEPHONE LINES.

________ PROJECT ENGINEER RCE NO 51929 10-24-07 DATE

PC 11645 PARCEL MAP NO. 26363 (1)

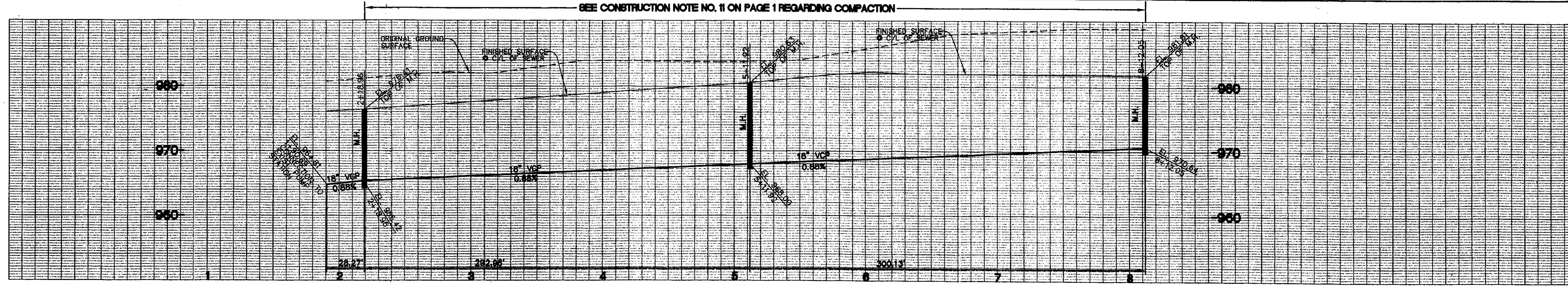
SEE CONSTRUCTION NOTE NO. 11 ON PAGE 1 REGARDING COMPACTION

P.C. 11645 PAGE 2

NO. L.A. Co. DPW CHARGES FOR CONNECTIONS

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES
TEL (562) 699-7411 EX. 2727

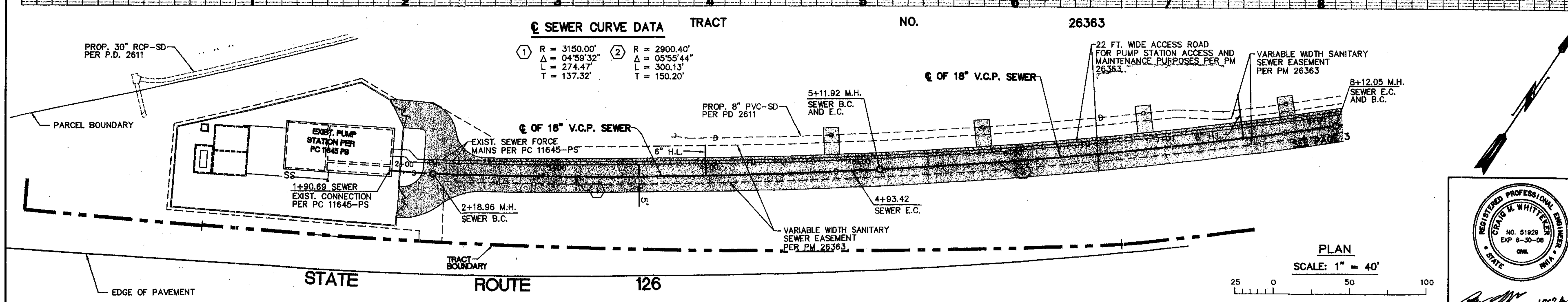
DOUBLE SCALE



TRACT NO. 26363

℄ SEWER CURVE DATA

(1) R = 3150.00', Δ = 04°59'32", L = 274.47', T = 137.32'
(2) R = 2900.40', Δ = 05°55'44", L = 300.13', T = 150.20'



PLAN
SCALE: 1" = 40'
25 0 50 100

SANITARY SEWER PLANS IN
PARCEL NO. 26363 PC NO. 11645

REVIEWED BY LAND DEVELOPMENT DIVISION
BY ________ SEWER AND WATER/LANDSCAPING SECTION 10-25-07 DATE

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEMORE NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA

ALLIANCE LAND PLANNING & ENGINEERING INC.
2248 FARADAY AVE.
CARLSBAD, CA 92008
TEL: (760) 431-9896
FAX: (760) 431-8802

________ PROJECT ENGINEER 10-24-07 DATE
E:\CAD\0610\SEWER\SHEET-01.DWG
JN 0610

OCT 31 2007
NOV 07 2007

APPROVED GS GRAVITY sewer


SEE CONSTRUCTION NOTE NO. 11 ON PAGE 1 REGARDING COMPACTION
P.C. 11645 PAGE 3
NO. L.A. CO. DPW CHARGES FOR CONNECTION
SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES
TEL. (562) 699-7411 EX. 2727
DOUBLE SCALE
FINISHED SURFACE @ C/L OF SEWER
ORIGINAL GROUND SURFACE
COMPACTED FILL
GRADE AT NORTH AND SOUTH CURBS
EL. 976.80 12" PVC
18" VCP 0.84%
18" VCP 0.60%
18" VCP 0.64%
343.31'
322.16'
322.48'
TRACT
NO.
26363
℄ SEWER CURVE DATA
R = 2900.40' Δ = 06°46'55" L = 343.31' T = 171.85'
R = 2175.00' Δ = 05°14'19" L = 198.86' T = 99.50'
8+12.05 M.H. SEWER B.C. AND E.C.
EXIST. SEWER FORCE MAIN PER PC 11645-PS
℄ OF 18" V.C.P. SEWER
VARIABLE WIDTH SANITARY SEWER EASEMENT PER PM 26363
22' WIDE ACCESS ROAD FOR PUMP STATION ACCESS AND MAINTENANCE PURPOSES PER PM 26363.
13+54.23 SEWER E.C.
CONST. COMMERCIAL DRIVEWAY PER ST. PLANS
14+77.52 SEWER M.H.
11+55.36 M.H. SEWER E.C.,B.C.
TRACT BOUNDARY
12" PVC PER PD2611
HANCOCK ℄ OF STREET PARKWAY
18+00.00 SEWER M.H.
R/W LINE
CURB LINE
6" H.L.
SEE PAGE 2
SEE PAGE 4
EDGE OF PAVEMENT
PLAN
SCALE: 1" = 40'
REVIEWED BY LAND DEVELOPMENT DIVISION
SEWER AND WATER/LANDSCAPE SECTION
10-25-07
DATE
REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA
PC 11645 MAP 26363 (5)

P.C. 11645 PAGE 4
NO. L.A. CO. DPW CHARGES FOR CONNECTION
SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES
TEL. (562) 699-7411 EX. 2727
DOUBLE SCALE
ORIGINAL GROUND SURFACE
GRADE OF NORTH AND SOUTH CURBS
COMPACTED FILL
18" VCP 0.92%
18" VCP 1.00%
18" VCP 1.00%
256.77'
339.36'
230.44'
TRACT
NO.
26363
℄ OF 18" V.C.P. SEWER
EXIST. SEWER FORCE MAIN PER PC 11645-PS
℄ OF STREET
18+00.00 SEWER M.H.
20+58.77 SEWER M.H.
23+96.13 M.H. SEWER B.C.
26+26.57 M.H. SEWER E.C. AND B.C.
HANCOCK
PARKWAY
SEE PAGE 3
SEE PAGE 5
R/W LINE
CURB LINE
6" H.L.
TRACT BOUNDARY
℄ SEWER CURVE DATA
R = 747.00' Δ = 17°40'30" L = 230.44' T = 116.14'
REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA
OCT 31 2007
NOV 07 2007
PLAN
SCALE: 1" = 40'

P.C. 11645 PAGE 5

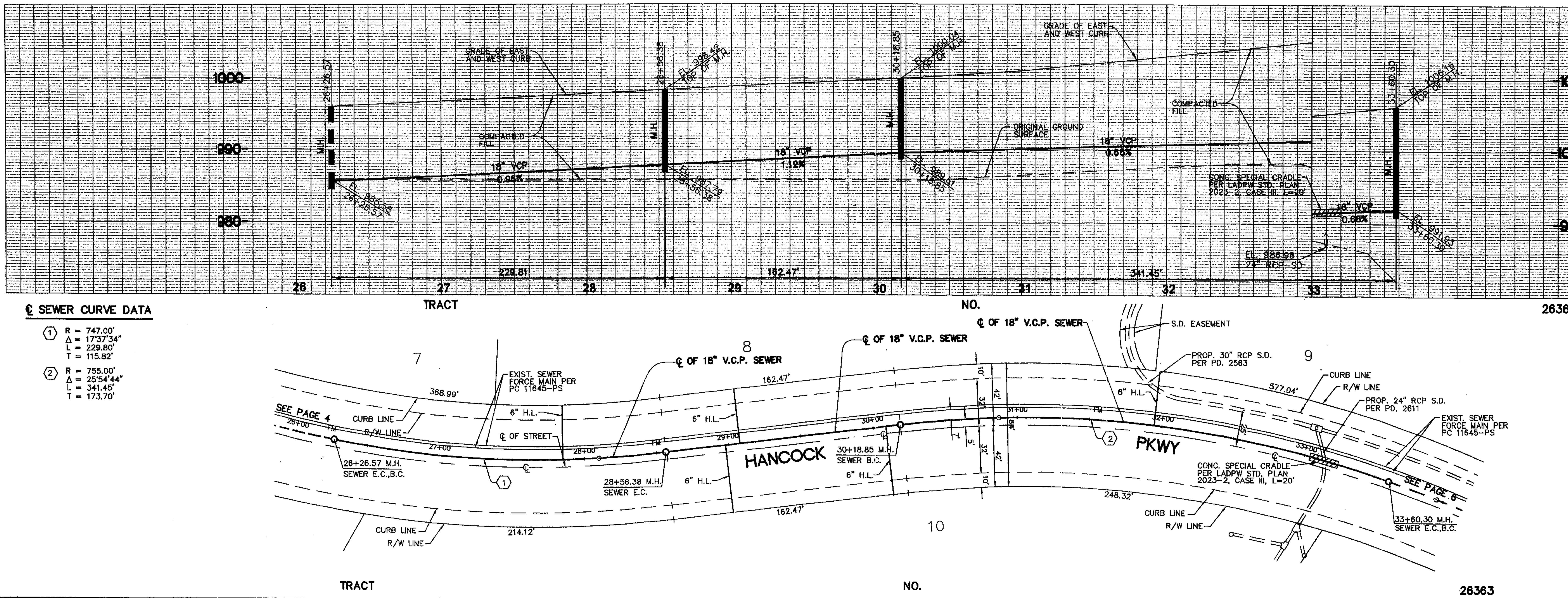
NO. L.A. CO. DPW CHARGES FOR CONNECTION

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727

DOUBLE SCALE

PC 11645 MAP 26363 (3)



REVIEWED BY LAND DEVELOPMENT DIVISION

BY [signature] SEWER AND WATER/LANDSCAPE SECTION 10-25-07 DATE

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA

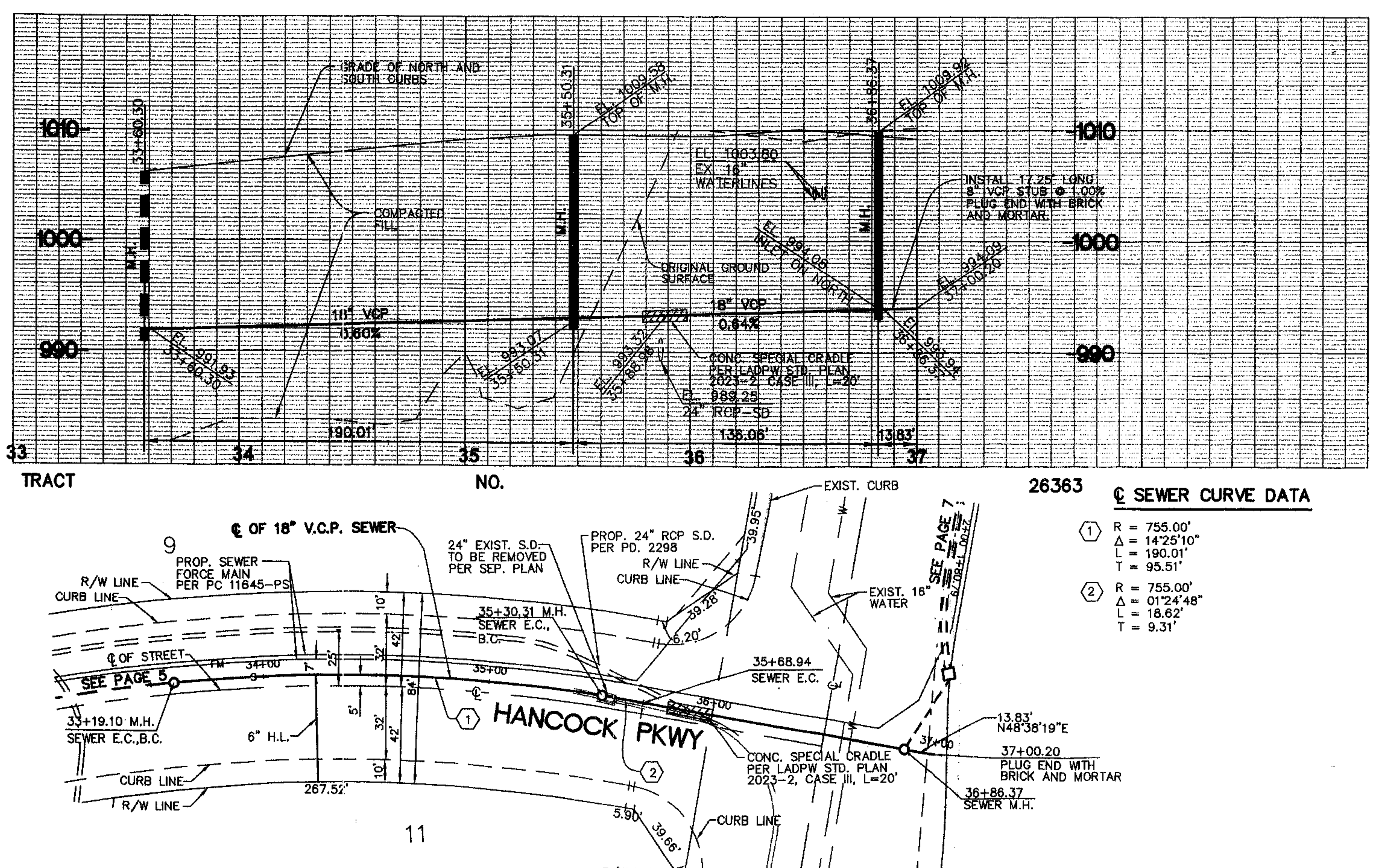
P.C. 11645 PAGE 6

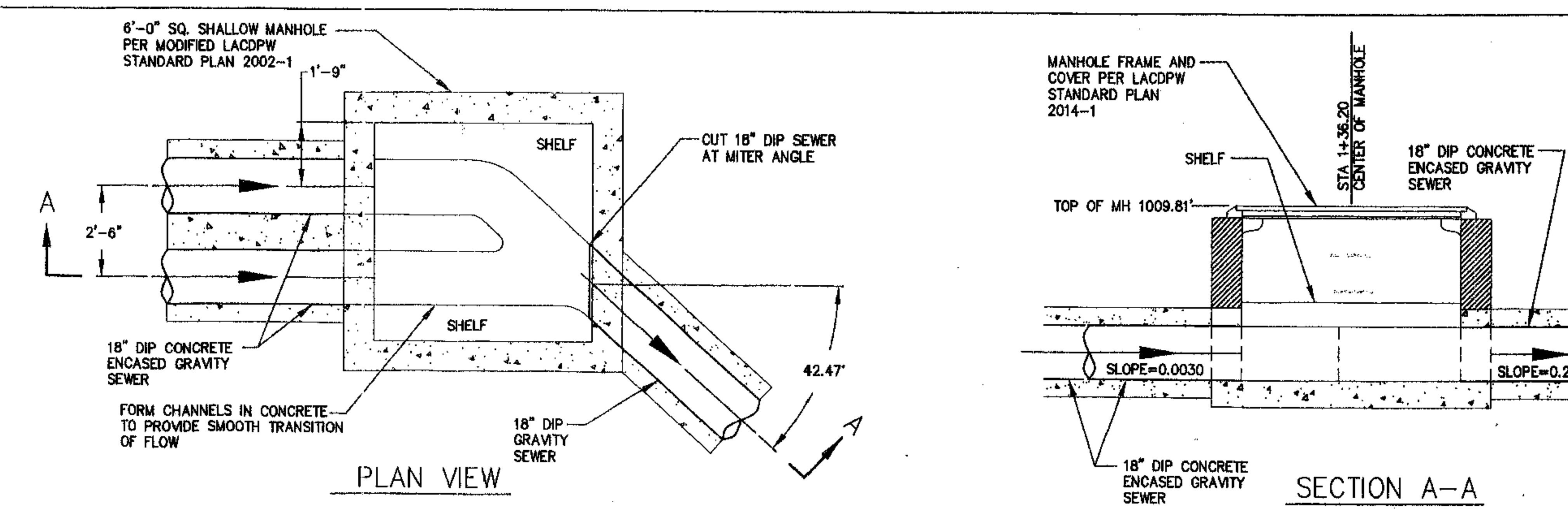
NO. L.A. CO. DPW CHARGES FOR CONNECTION

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727

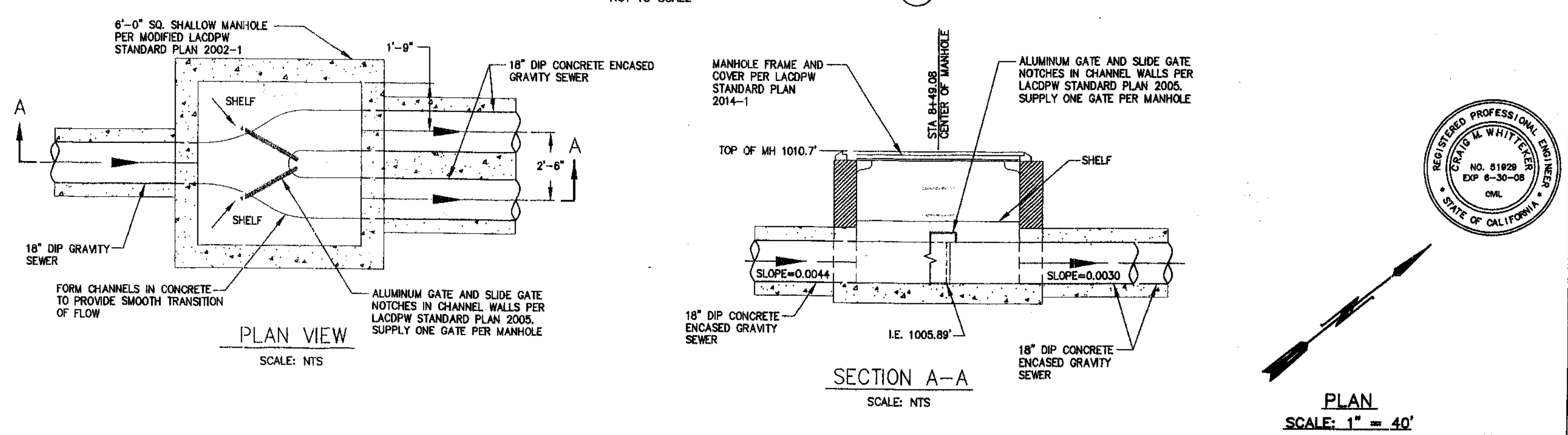
DOUBLE SCALE





GRAVITY SEWER CONVERGENT MANHOLE AT STA 1+36.20 (A/VAR)

NOT TO SCALE



GRAVITY SEWER DIVERGENT MANHOLE AT STA 8+49.08 (A/VAR)

NOT TO SCALE

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BY [signature] SEWER AND WATER/LANDSCAPE SECTION 10-25-07 DATE

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA

JN 0610 NOV 0 7 2007 OCT 3 1 2007 I:CAD\0610\SEWER\SHEET-03.dwg

(4) PC 11645 MAP 26363

JN 0610 NOV 07 2007 OCT 31 2007 I:CAD\0610\SEWER\SHEET-04.DWG

SEE CONSTRUCTION NOTE NO. 11 ON PAGE 1 REGARDING COMPACTION

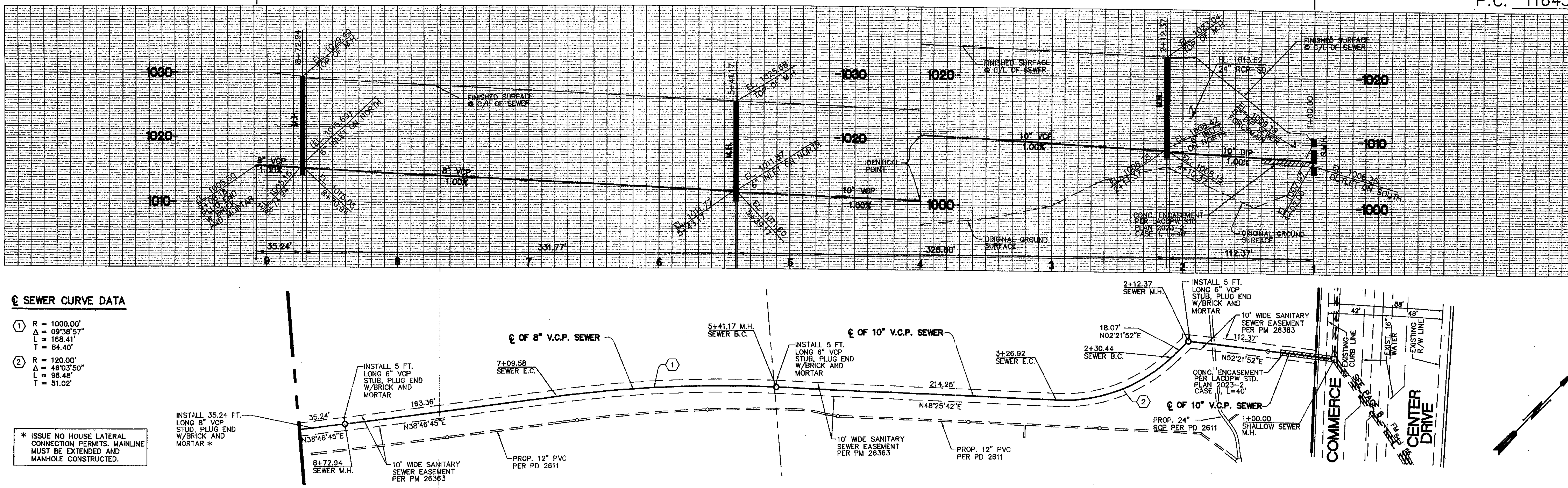
P.C. 11645 PAGE 9

NO. L.A. CO. DPW CHARGES FOR CONNECTION

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES

TEL. (562) 699-7411 EX. 2727

DOUBLE SCALE



℄ SEWER CURVE DATA

1. R = 1000.00'
   Δ = 09°38'57"
   L = 168.41'
   T = 84.40'
2. R = 120.00'
   Δ = 46°03'50"
   L = 96.48'
   T = 51.02'

* ISSUE NO HOUSE LATERAL CONNECTION PERMITS. MAINLINE MUST BE EXTENDED AND MANHOLE CONSTRUCTED.

PLAN
SCALE: 1" = 40'

25 50 100

TRACT NO. 26363

REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA

REVIEWED BY LAND DEVELOPMENT DIVISION
BY [signature] 10-25-07
SEWER AND WATER/LANDSCAPE SECTION DATE

I:CAD\0610\SEWER\SHEET-04.DWG

P.C. 11645 PAGE

NO. L.A. CO. DPW CHARGES FOR CONNECTION

SEE SANITATION DISTRICTS FOR SPECIAL CONNECTION CHARGES

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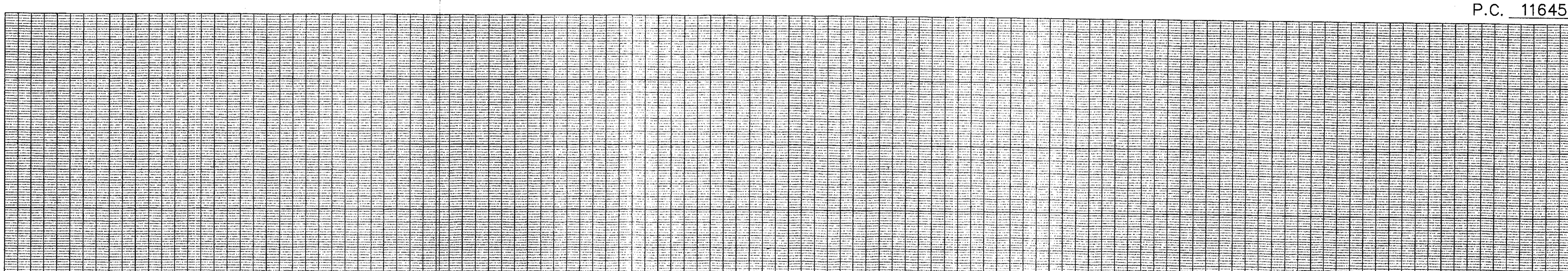
DOUBLE SCALE



REGISTERED PROFESSIONAL ENGINEER CRAIG M. WHITTEKER NO. 51929 EXP 6-30-08 CIVIL STATE OF CALIFORNIA

PLAN
SCALE: 1" = 40'

25 0 50 100

REVIEWED BY LAND DEVELOPMENT DIVISION
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SEWER AND WATER/LANDSCAPE SECTION DATE

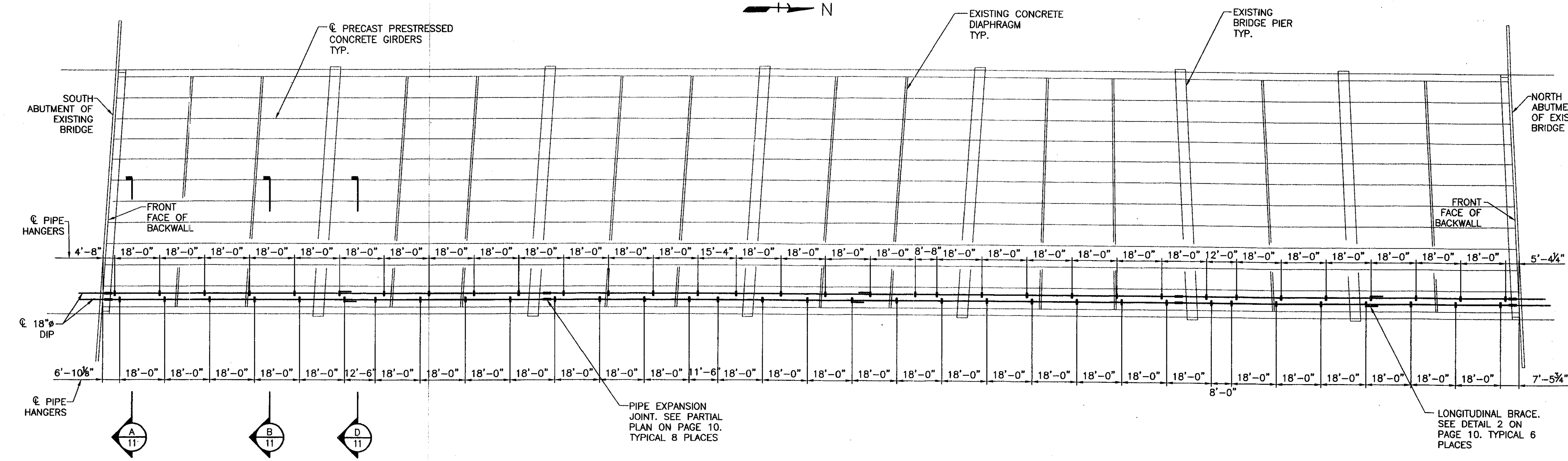
JN 0610

NOV 07 2007

I:CAD\0610\SEWER\SHEET-05.DWG

OCT 31 2007

PC 11645 PAGE 9 PAGE 26363



PLAN EXISTING BRIDGE – COMMERCE CENTER DR. OVER CASTAIC CREEK

SCALE: 1" = 20'

PROFILE 18"ø DUCTILE IRON PIPES

VERTICAL SCALE EXAGGERATED

CONSTRUCTION NOTES:

1. DO NOT DAMAGE EXISTING REINFORCEMENT BARS. EXISTING REINFORCEMENT BARS WITHIN NEW CONCRETE SHALL BE PROTECTED IN PLACE.
2. REINFORCEMENT BARS SHALL BE CUT FLUSH WITH THE SURFACE OF THE NEW OPENING AND THE EXPOSED END OF THE BARS SHALL BE BURNED OFF 1" BELOW THE SURFACE OF THE CONCRETE AND THE VOID SHALL BE FILLED WITH EPOXY.
3. IF REINFORCEMENT BARS ARE ENCOUNTERED DURING THE DRILLING FOR THE PIPE SUPPORT, THE SUPPORT BRACKET SHALL BE SHIFTED TO AVOID REINFORCEMENTS, AND THE PRIOR HOLE DRILLED SHALL BE FILLED WITH EPOXY.

GENERAL NOTES:

1. CONCRETE FOR EDGE BEAMS SHALL BE A 4000 PSI MIX WITH ⅜" MAXIMUM AGGREGATE SIZE. THE CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 2". A SUPERPLASTICIZER SHALL BE ADDED BEFORE PLACING THE CONCRETE TO INCREASE THE SLUMP TO 8".
2. ALL REINFORCEMENT STEEL SHALL BE ASTM DESIGNATION A615 GRADE 60.

R2H ENGINEERING, INC.
CONSULTING STRUCTURAL ENGINEERS
17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

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SEWER AND WATER/LANDSCAPING SECTION DATE

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/09 STRUCTURAL STATE OF CALIFORNIA

PROJECT ENGINEER DATE 10/16/07

T.G.P. 4549 GRID H1

18" DIP BRIDGE CROSSING

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:
ALLIANCE LAND PLANNING & ENGINEERING INC.
5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

TRACT NO. 26363

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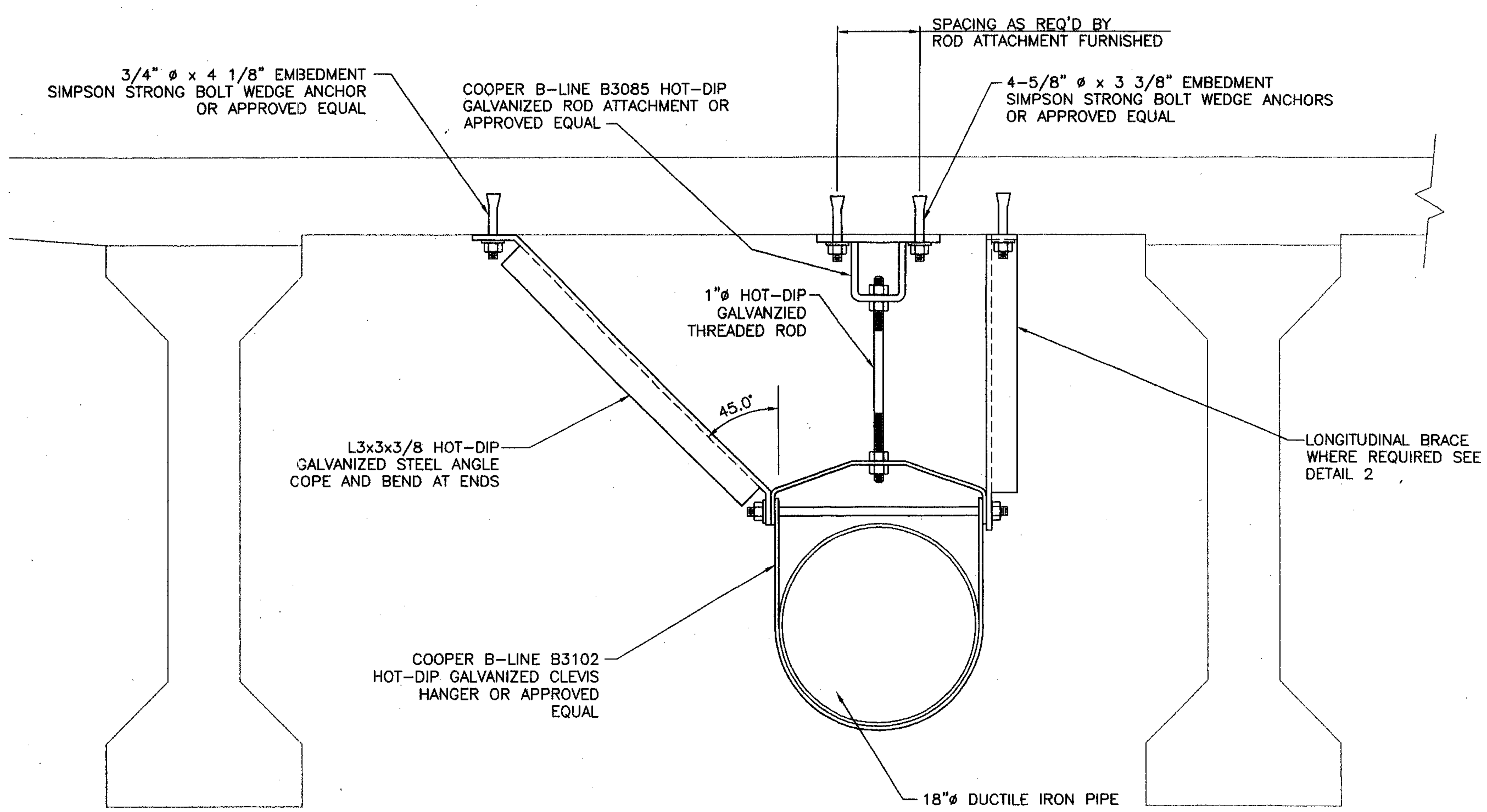
OCT 3 1 2007

P.C. 11981 PARCEL MAP NO. 23636

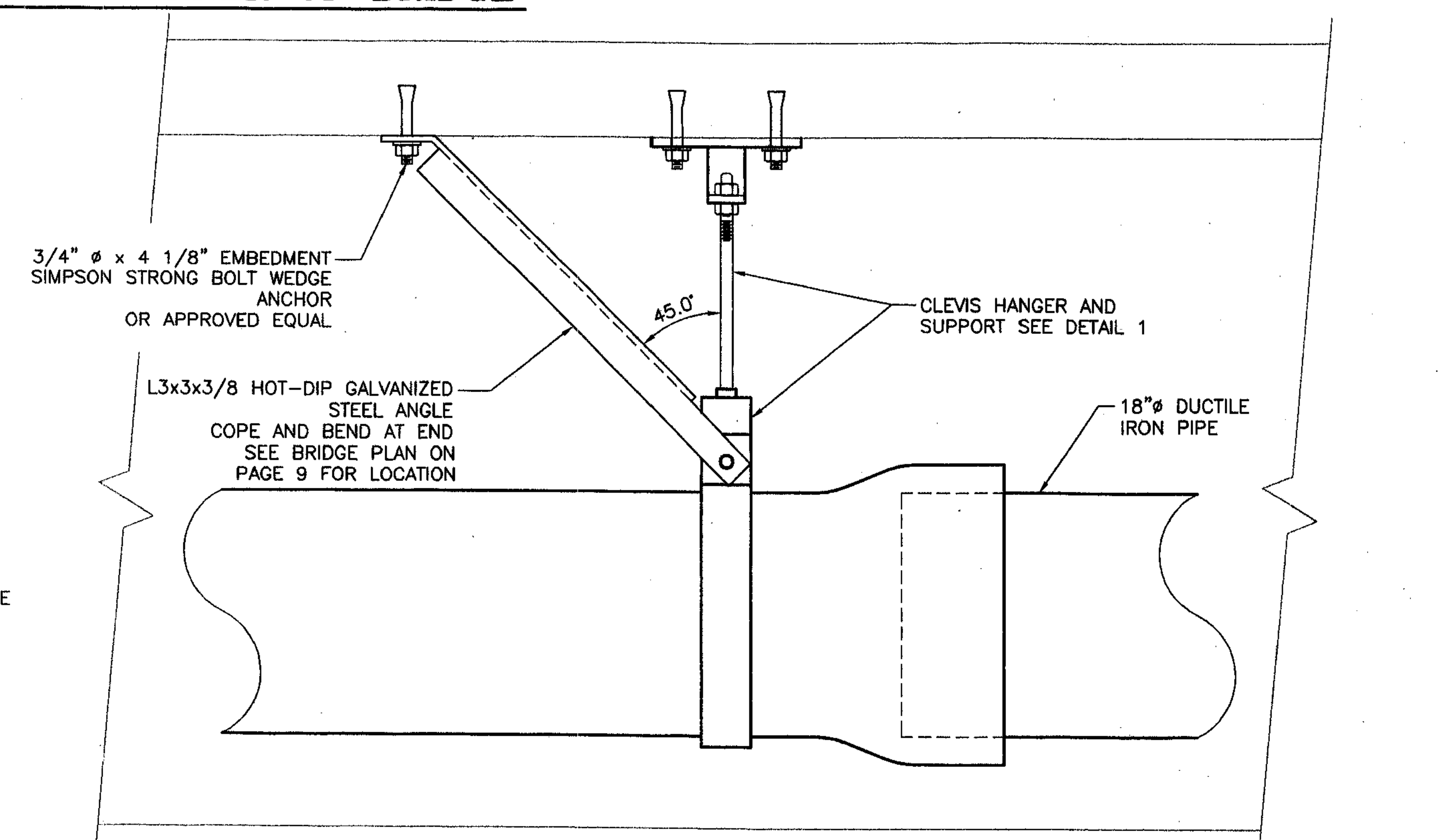
PARTIAL PLAN AT SOUTHEAST CORNER OF BRIDGE

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



TYPICAL PIPE SUPPORT AND HORIZONTAL BRACE DETAIL 1/10

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



TYPICAL LONGITUDINAL BRACE DETAIL 2/10

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

T.G.P.4549 GRID H1

18" DIP BRIDGE CROSSING DETAILS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

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BY [signature] SEWER AND WATER/LANDSCAPING SECTION 10-25-07 DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/09 STRUCTURAL STATE OF CALIFORNIA

[signature] PROJECT ENGINEER 10/15/07 DATE

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5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

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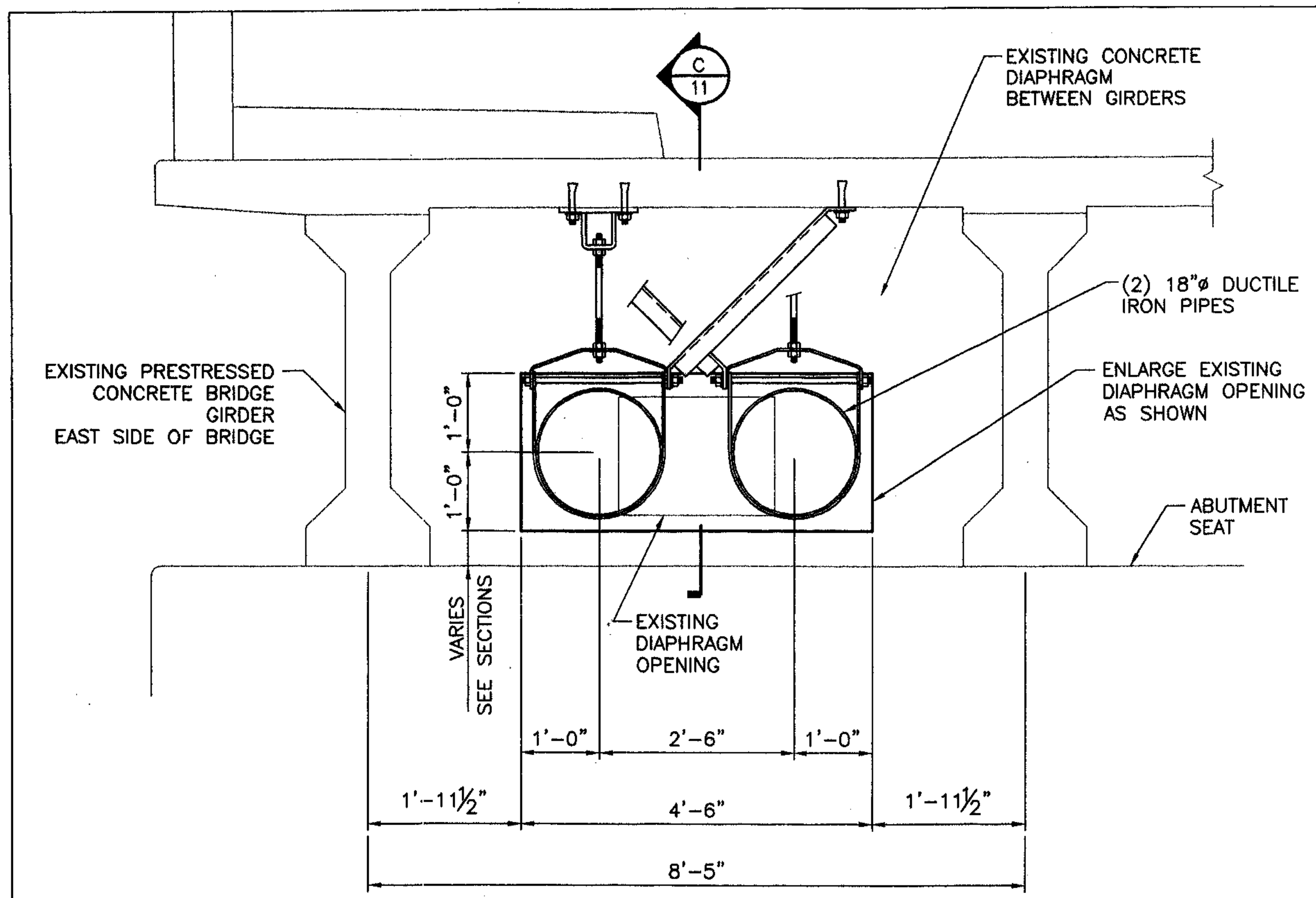
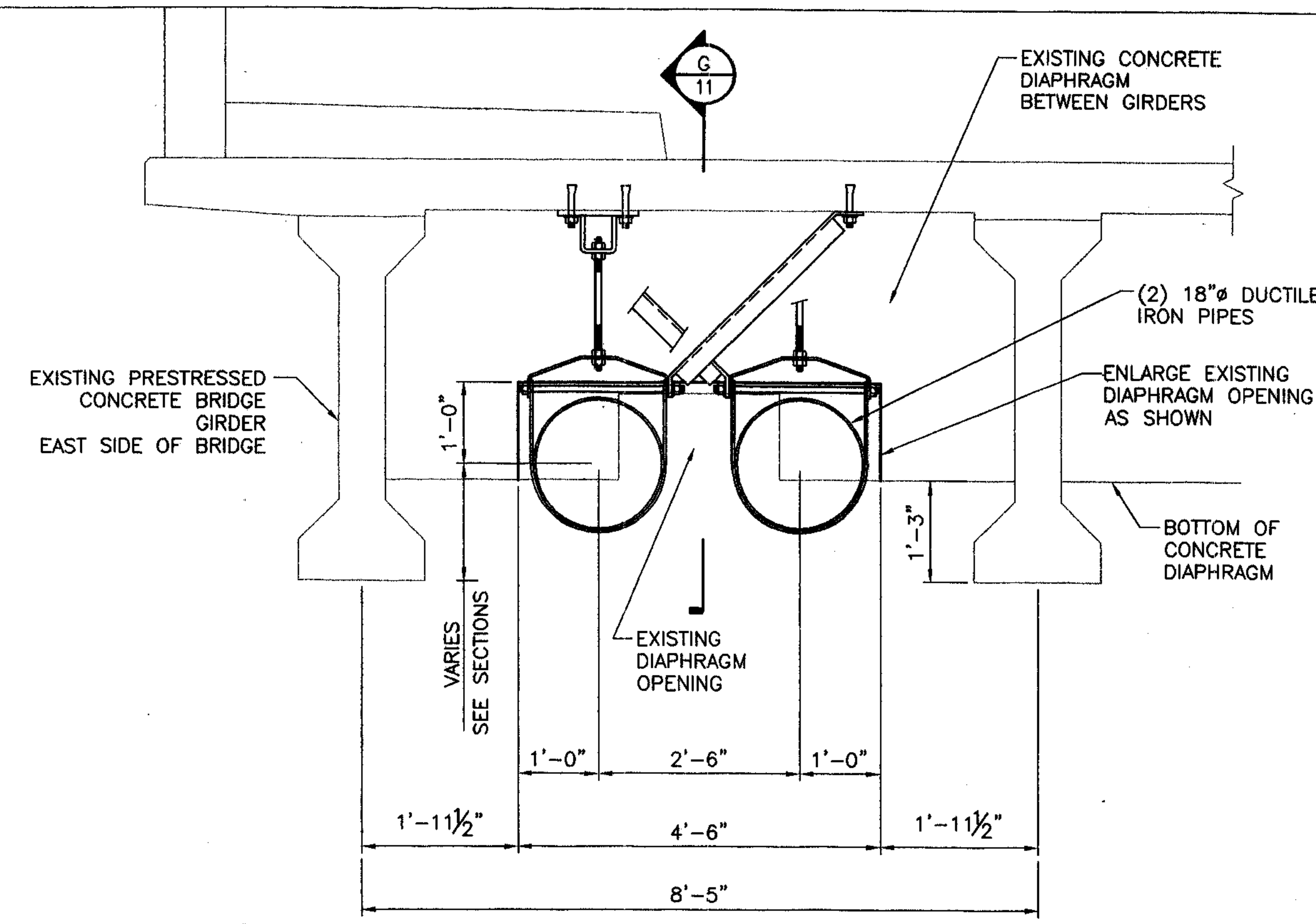


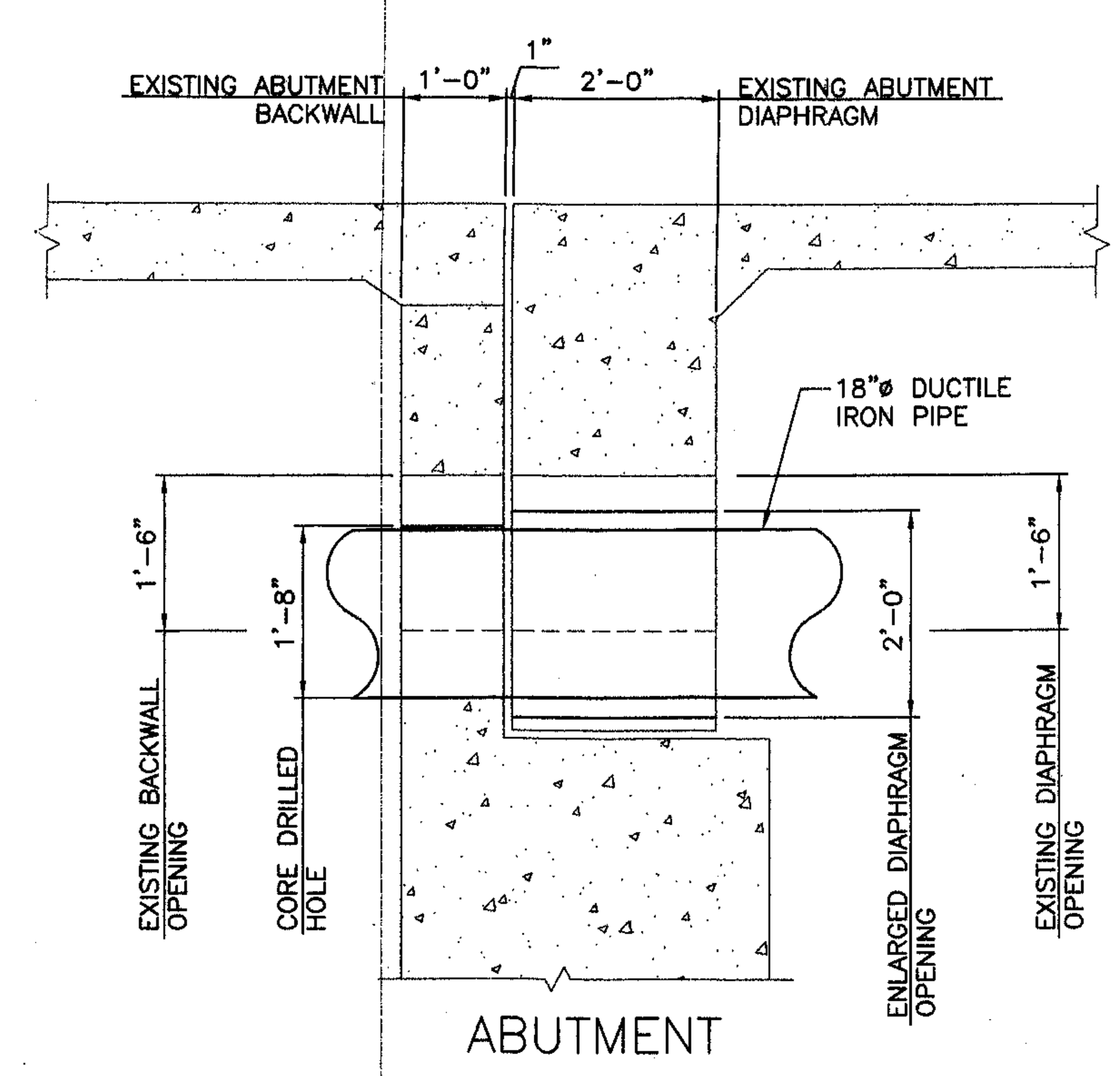
TYPICAL SECTION AT ABUTMENTS (A/11)

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



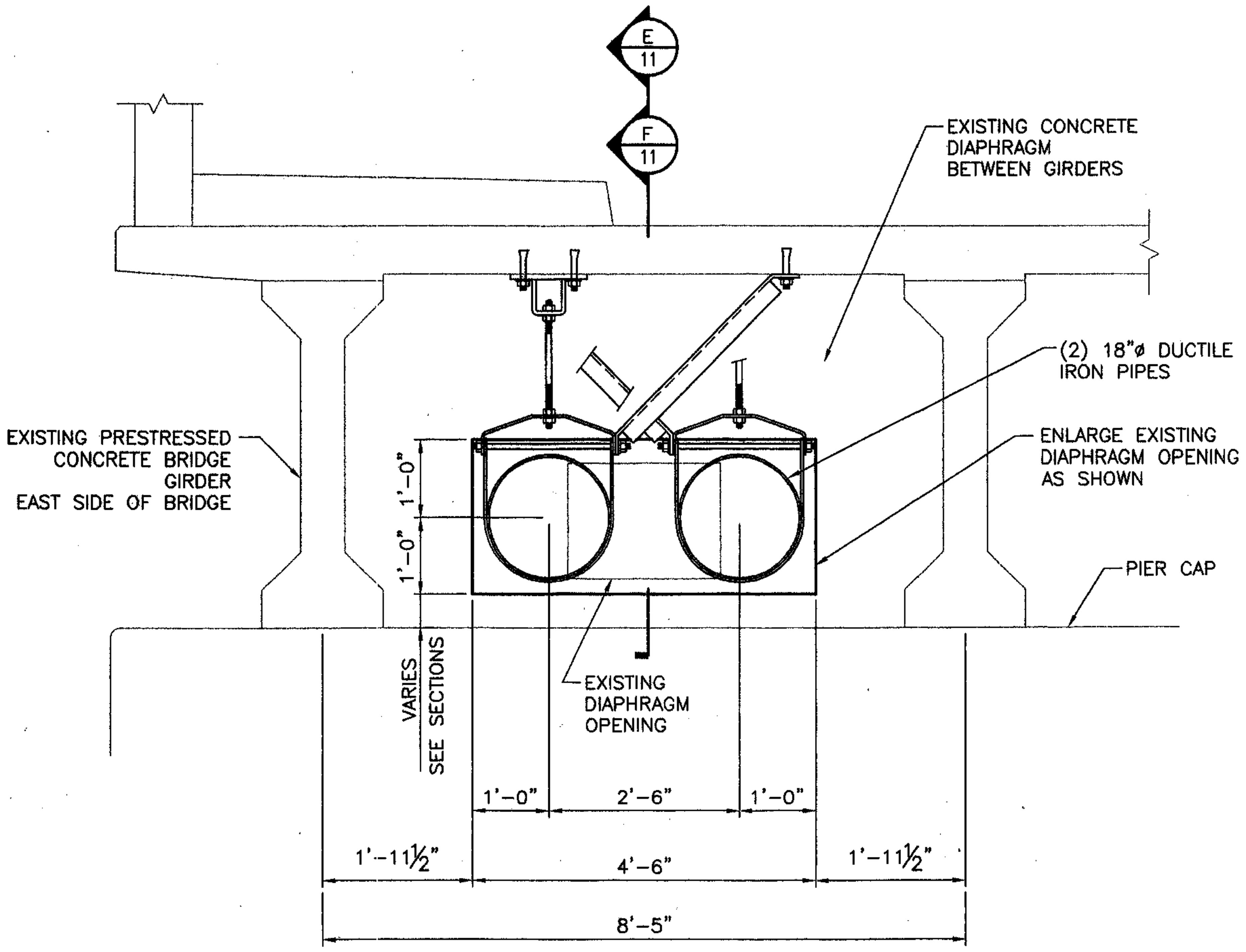
TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS (B/11)

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



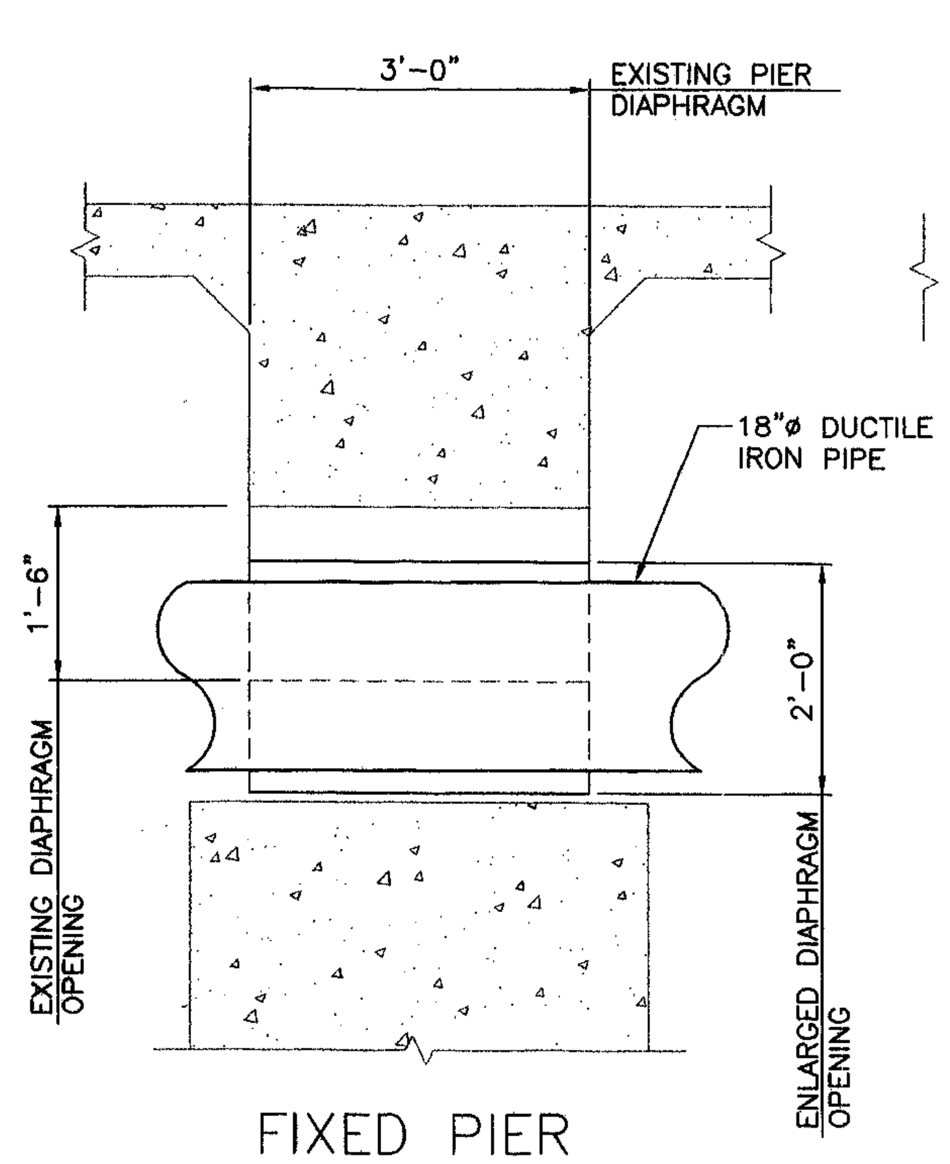
SECTION (C/11)

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



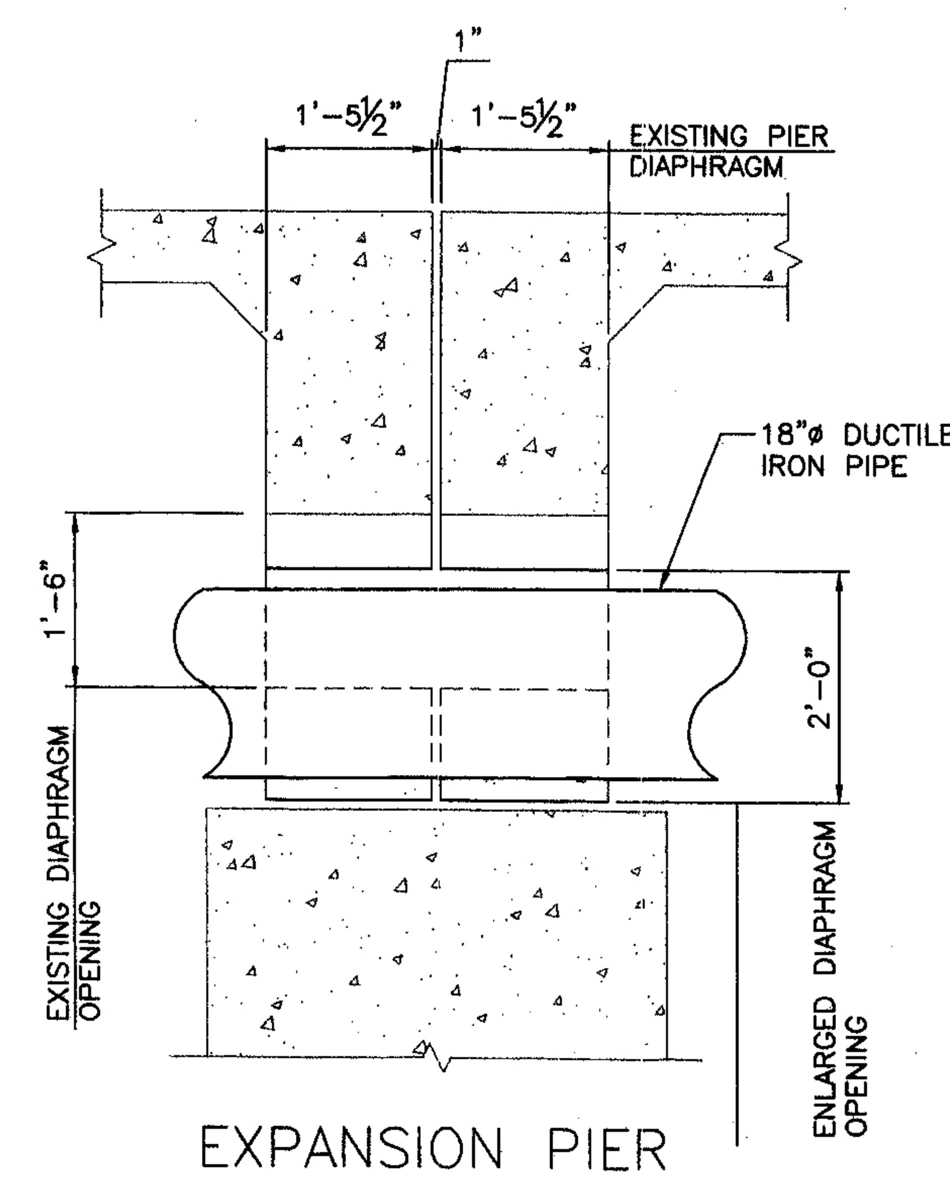
TYPICAL SECTION AT PIERS (D/11)

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



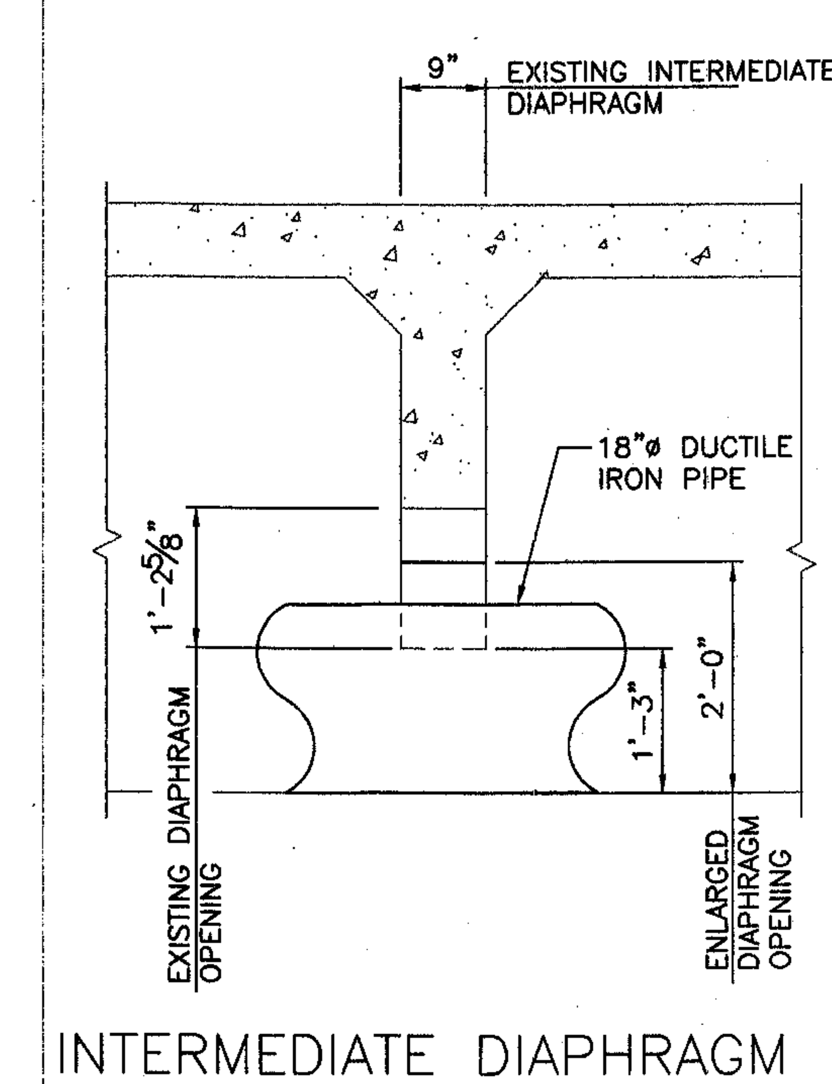
SECTION (E/11)

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



SECTION (F/11)

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



SECTION (G/11)

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

T.G.P.4549 GRID H1

18" DIP BRIDGE CROSSING DETAILS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

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CONSULTING STRUCTURAL ENGINEERS
17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

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BY [signature] 10-25-07
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BY [signature] 10-26-07
SEWER AND WATER/LANDSCAPING SECTION DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/08 STRUCTURAL STATE OF CALIFORNIA

[signature] 10/15/07
PROJECT ENGINEER DATE

PLANS PREPARED BY:

ALLIANCE
LAND PLANNING & ENGINEERING INC.
5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

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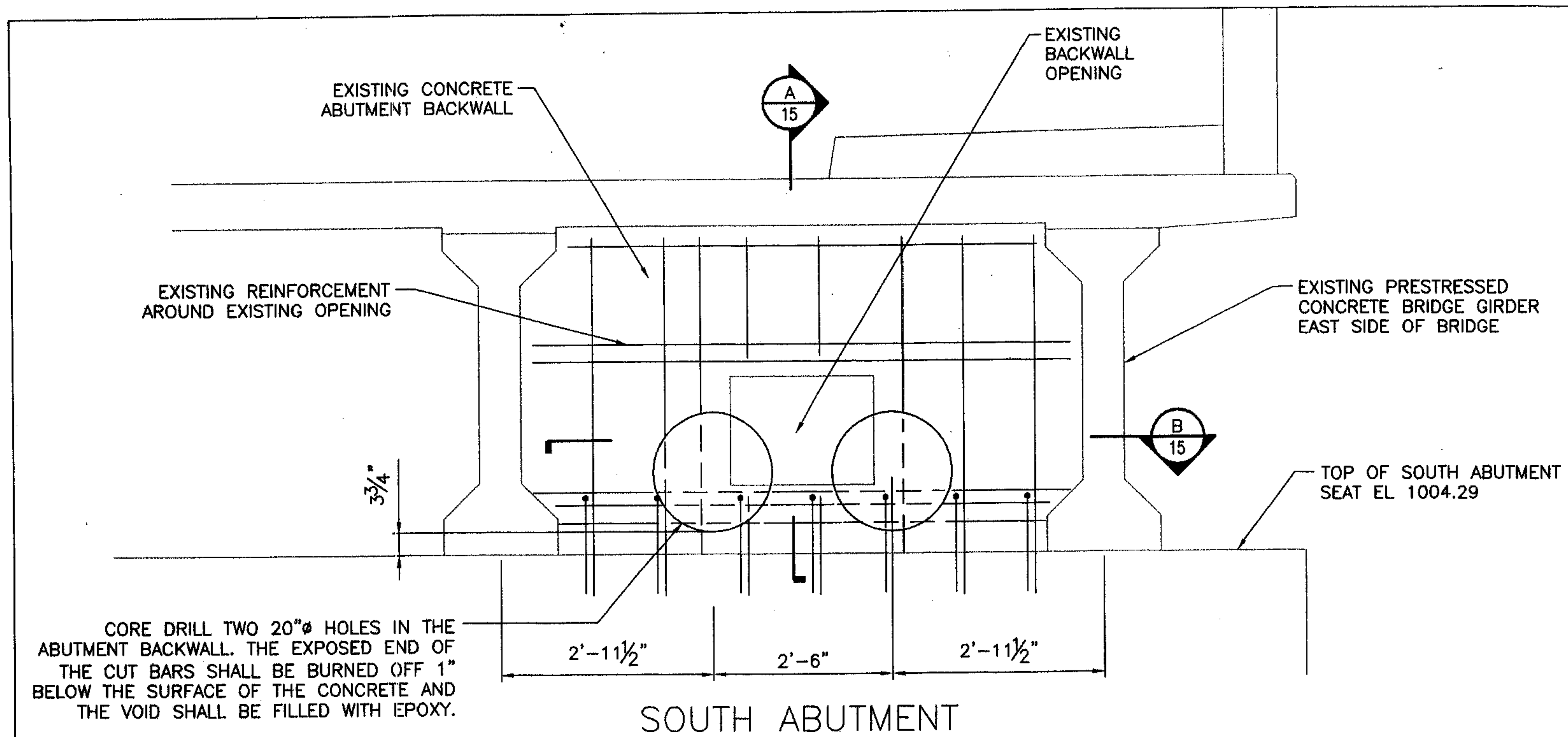
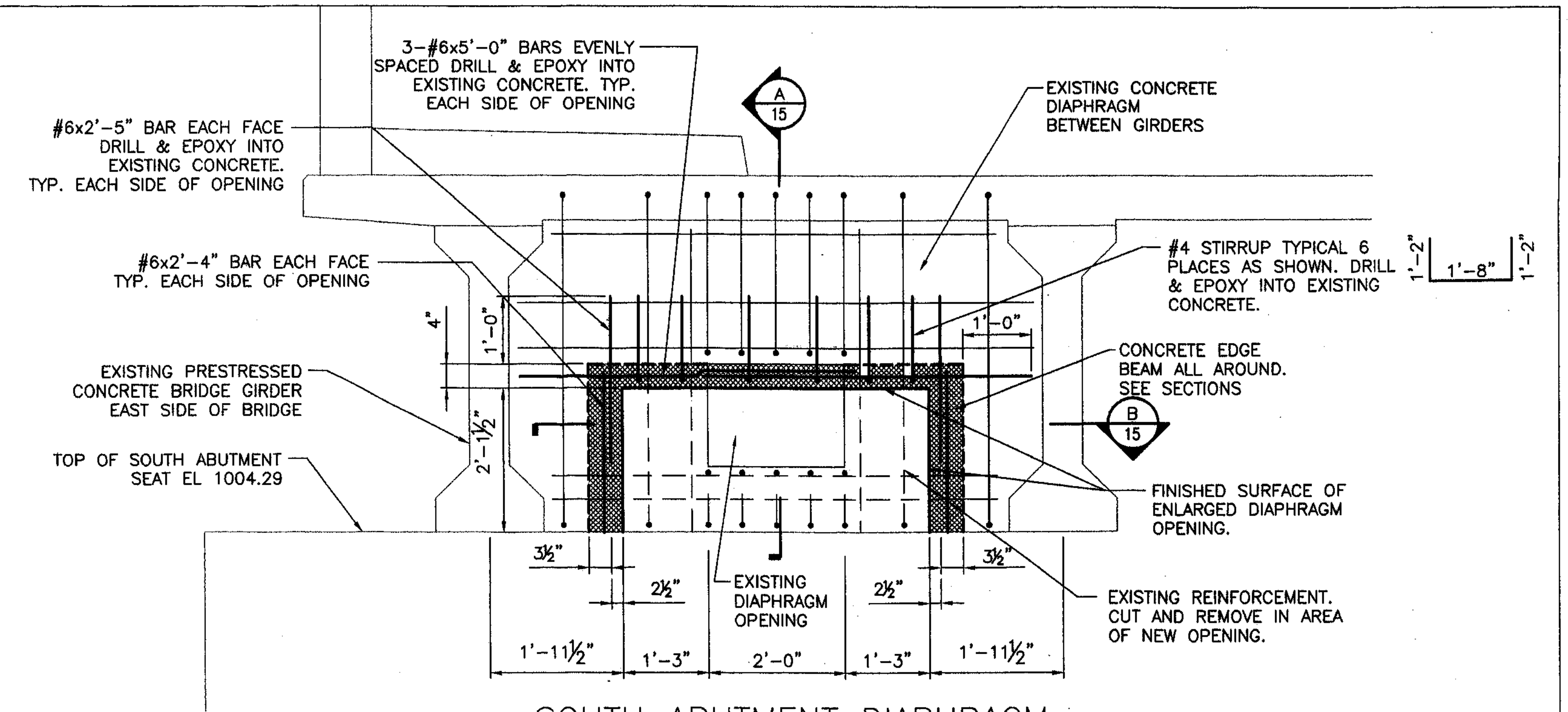
P.C. 11645 PARCEL MAP NO. 26363 (B)

P.C. 11162 PARCEL MAP NO. 26363



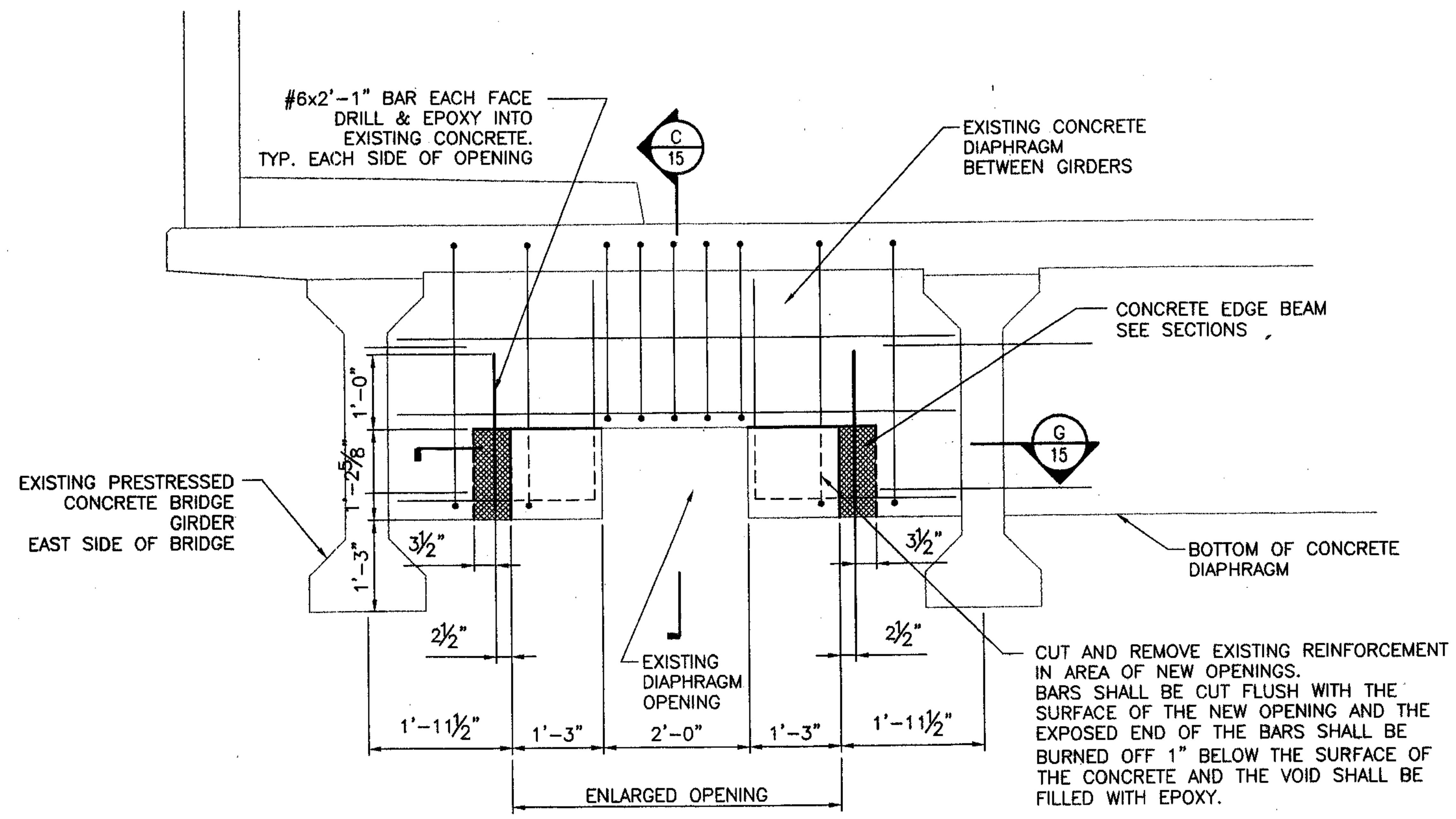
SOUTH ABUTMENT BACKWALL

SECTION A/12
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



SOUTH ABUTMENT DIAPHRAGM

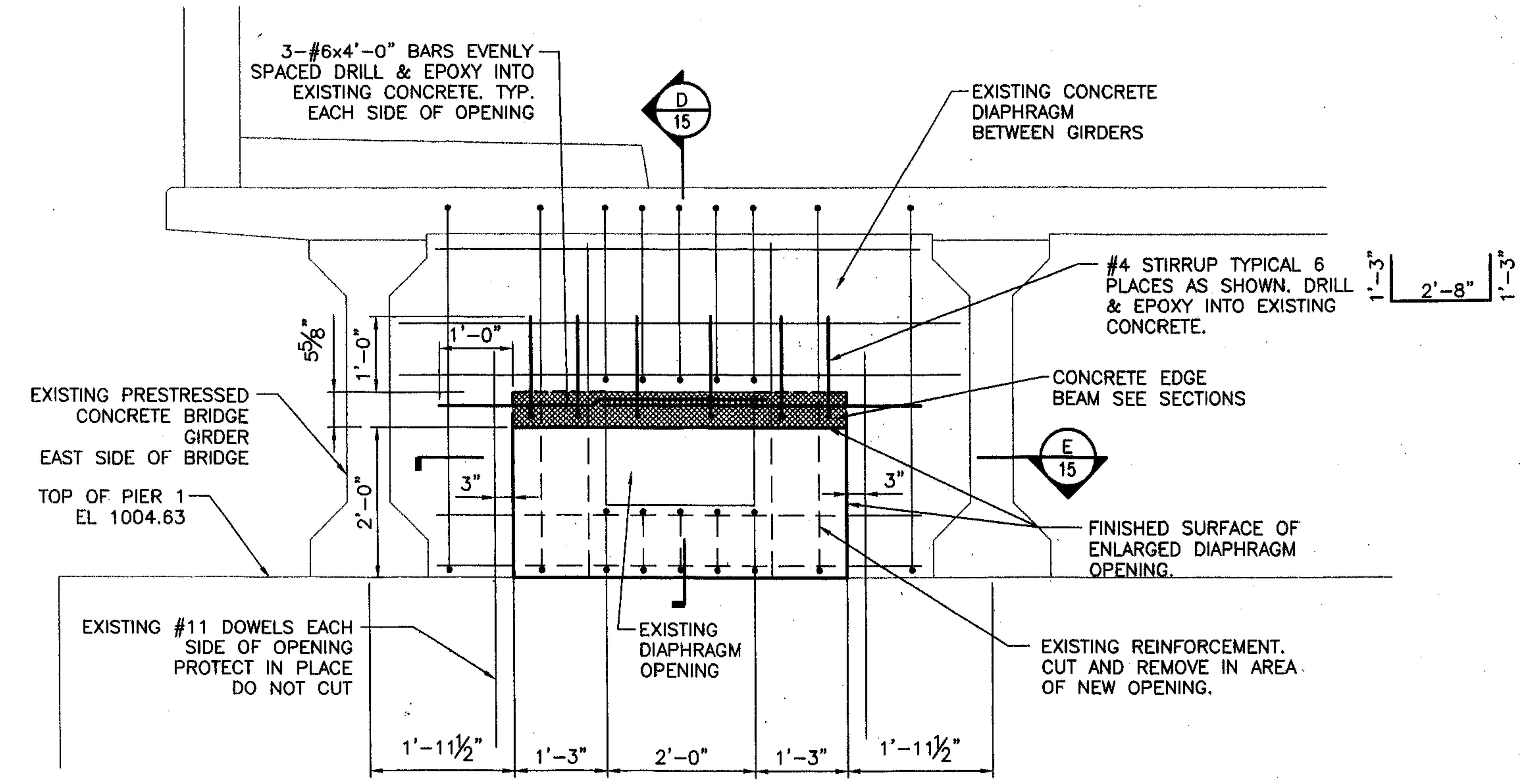
SECTION B/12
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



INTERMEDIATE DIAPHRAGM

(APPLIES TO INTERMEDIATE DIAPHRAGMS AT SECTIONS LOCATED AS SHOWN ON THE PIPE PROFILE ON PAGE 9)

SECTION C/12
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



PIER 7 DIAPHRAGM

SECTION D/12
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN

T.G.P.4549 GRID H1

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CONSULTING STRUCTURAL ENGINEERS
17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

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BY [signature] 10-25-07
SEWER AND WATER/LANDSCAPING SECTION DATE

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 9/30/09 STRUCTURAL STATE OF CALIFORNIA

[signature] 10/25/07
PROJECT ENGINEER DATE

18" DIP BRIDGE CROSSING SECTIONS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

PLANS PREPARED BY:
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5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

TRACT NO. 26363
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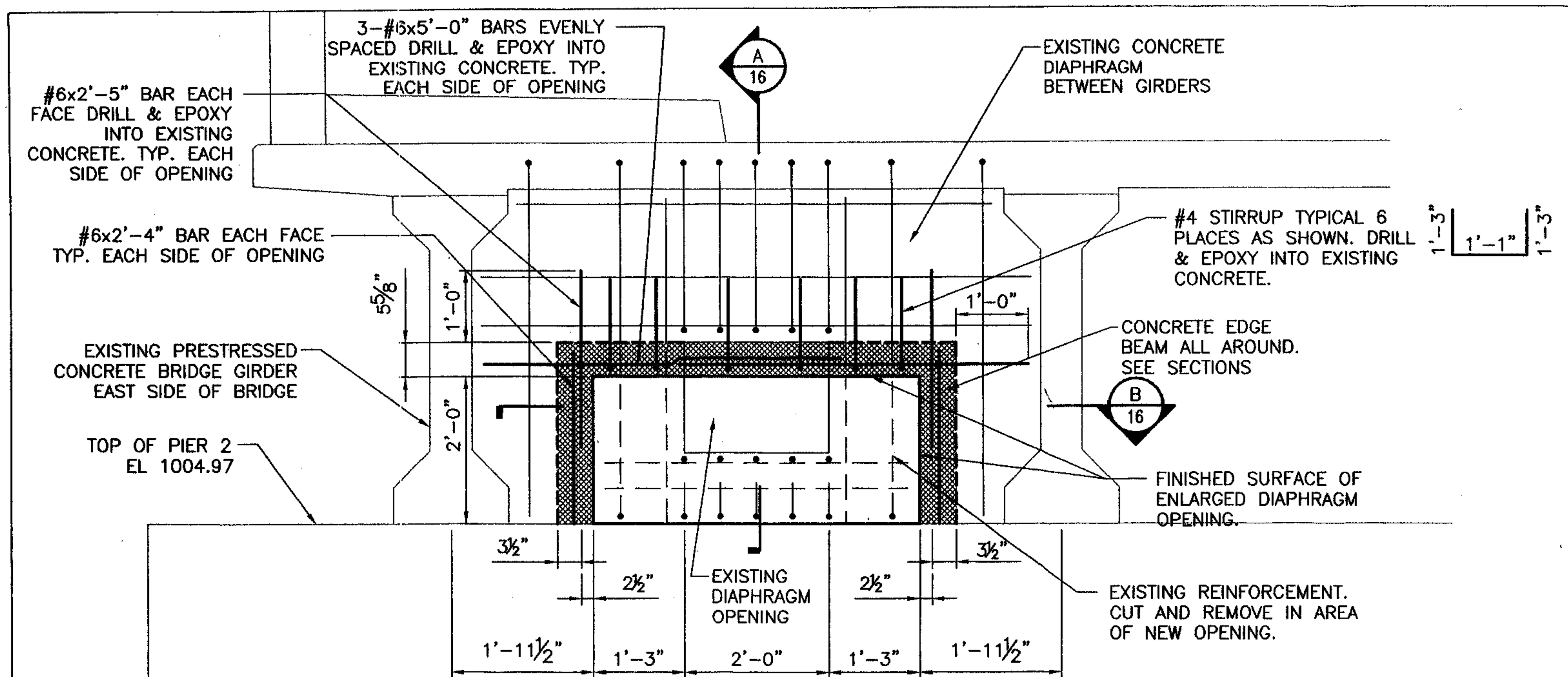
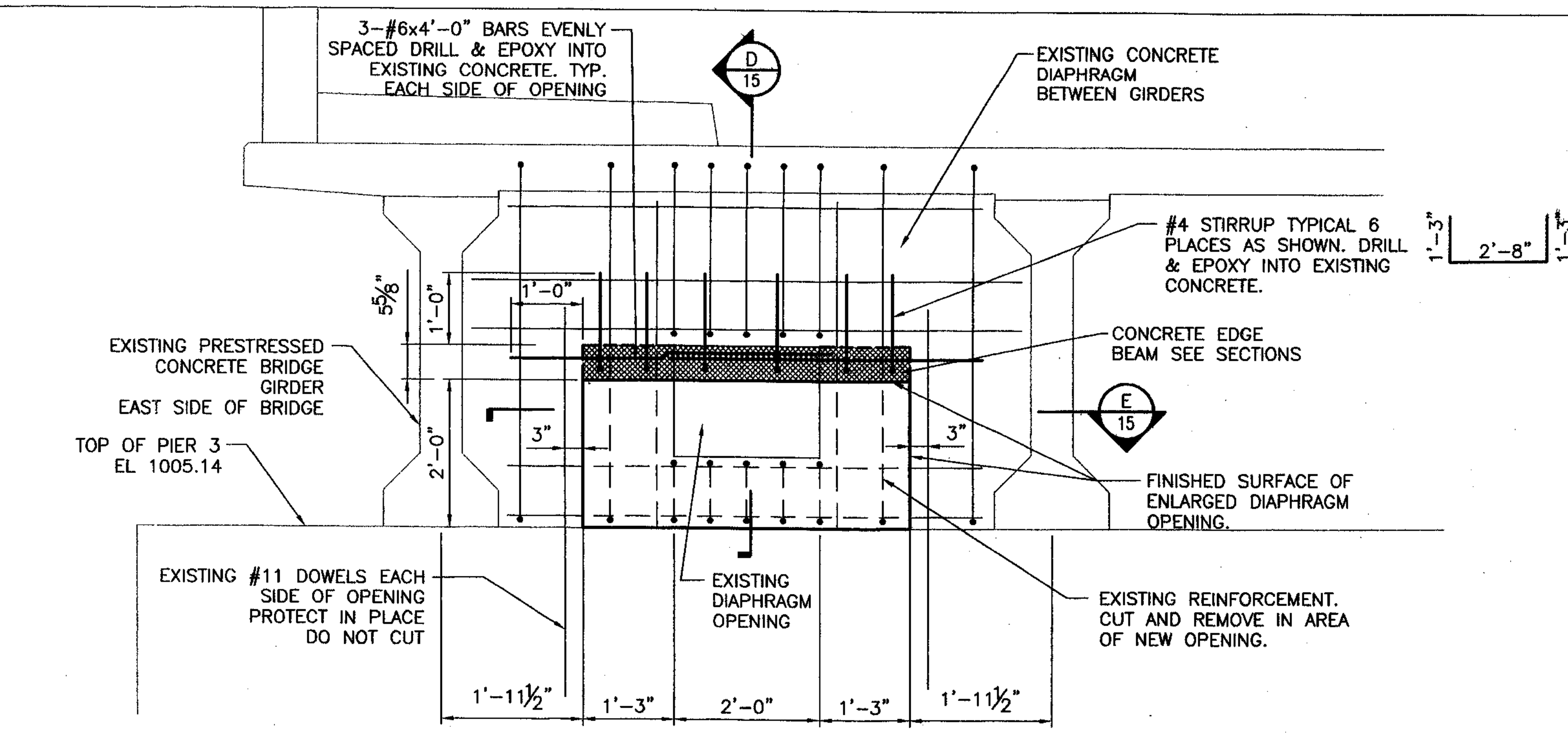


PIER 6 DIAPHRAGM AT EXPANSION JOINT

REINFORCEMENT SHOWN IS TYPICAL IN 2 DIAPHRAGMS. ONE ON EACH SIDE OF EXPANSION JOINT. SEE SECTIONS

SECTION A 13

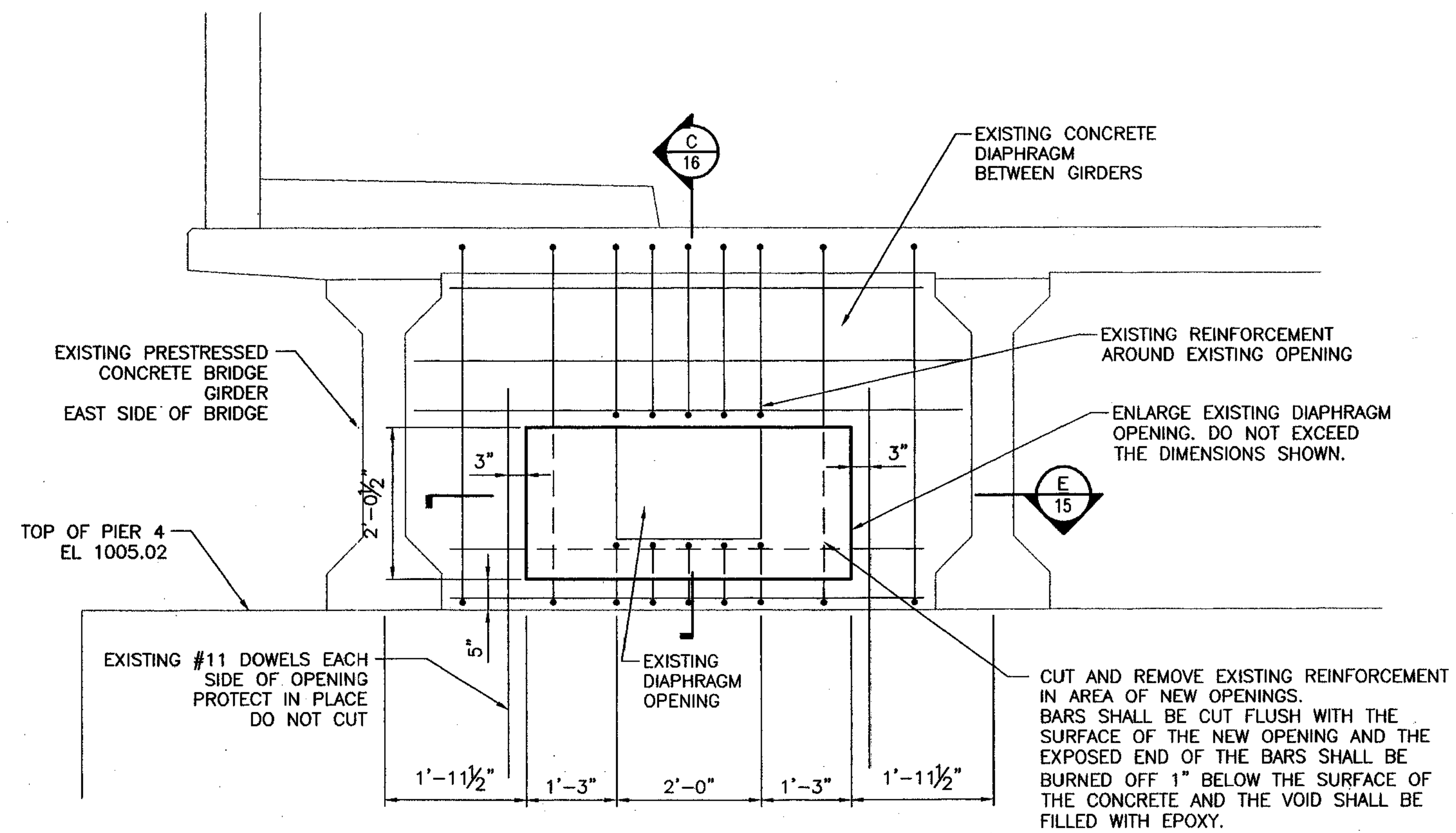
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



PIER 5 DIAPHRAGM

SECTION B 13

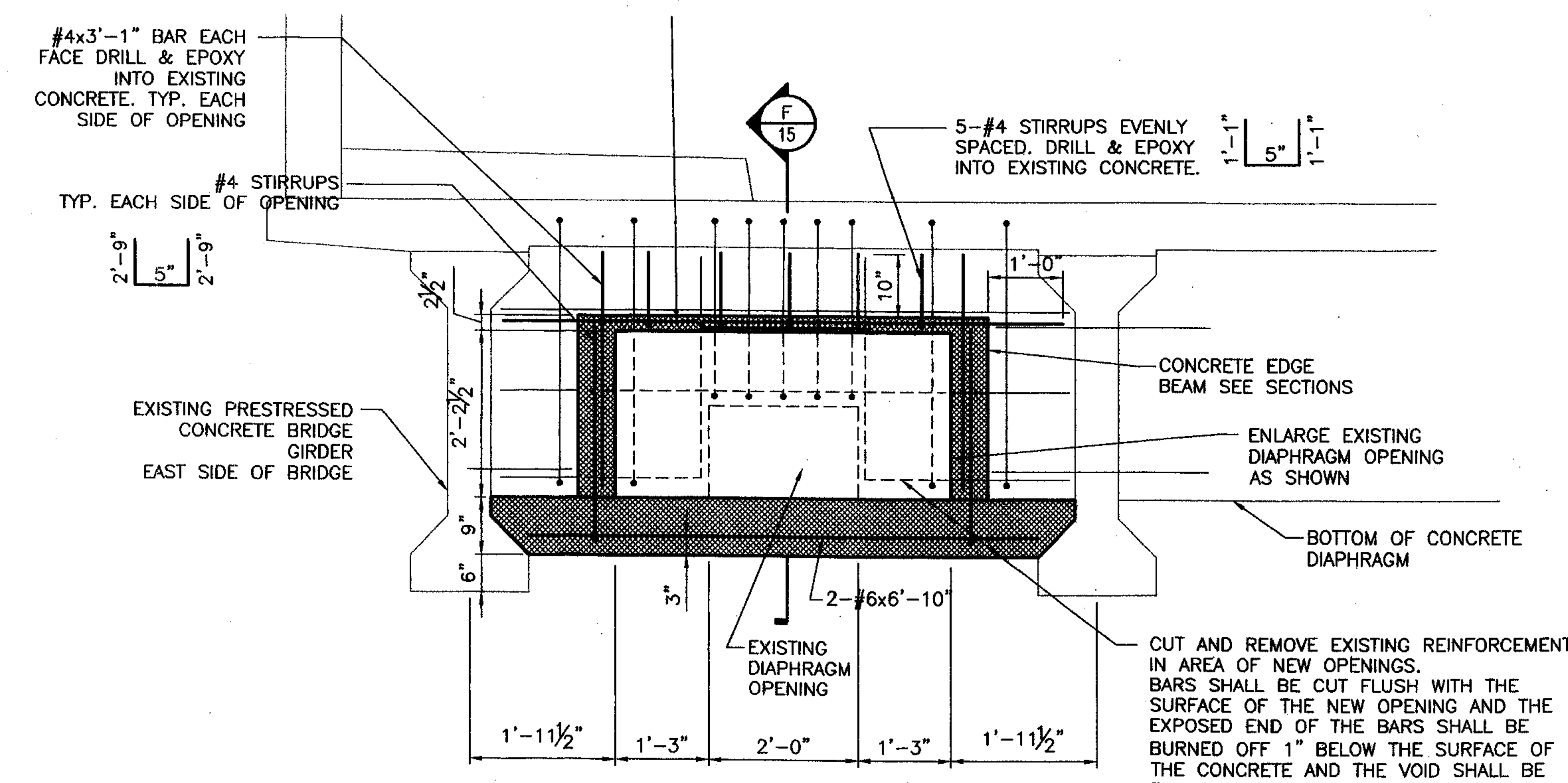
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



PIER 4 DIAPHRAGM

SECTION C 13

SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



INTERMEDIATE DIAPHRAGM

(APPLIES TO INTERMEDIATE DIAPHRAGMS AT SECTIONS LOCATED AS SHOWN ON THE PIPE PROFILE ON PAGE 9)

SECTION D 13

SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN

T.G.P.4549 GRID H1

18" DIP BRIDGE CROSSING SECTIONS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

REVIEWED DESIGN DIVISION
BY [signature] STRUCTURES 1 SECTION 10-25-07 DATE

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BY [signature] SEWER AND WATER/LANDSCAPING SECTION 10-25-07 DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/07 STRUCTURAL STATE OF CALIFORNIA

PROJECT ENGINEER [signature] 10/15/07 DATE

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ALLIANCE LAND PLANNING & ENGINEERING INC.
5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

TRACT NO. 26363

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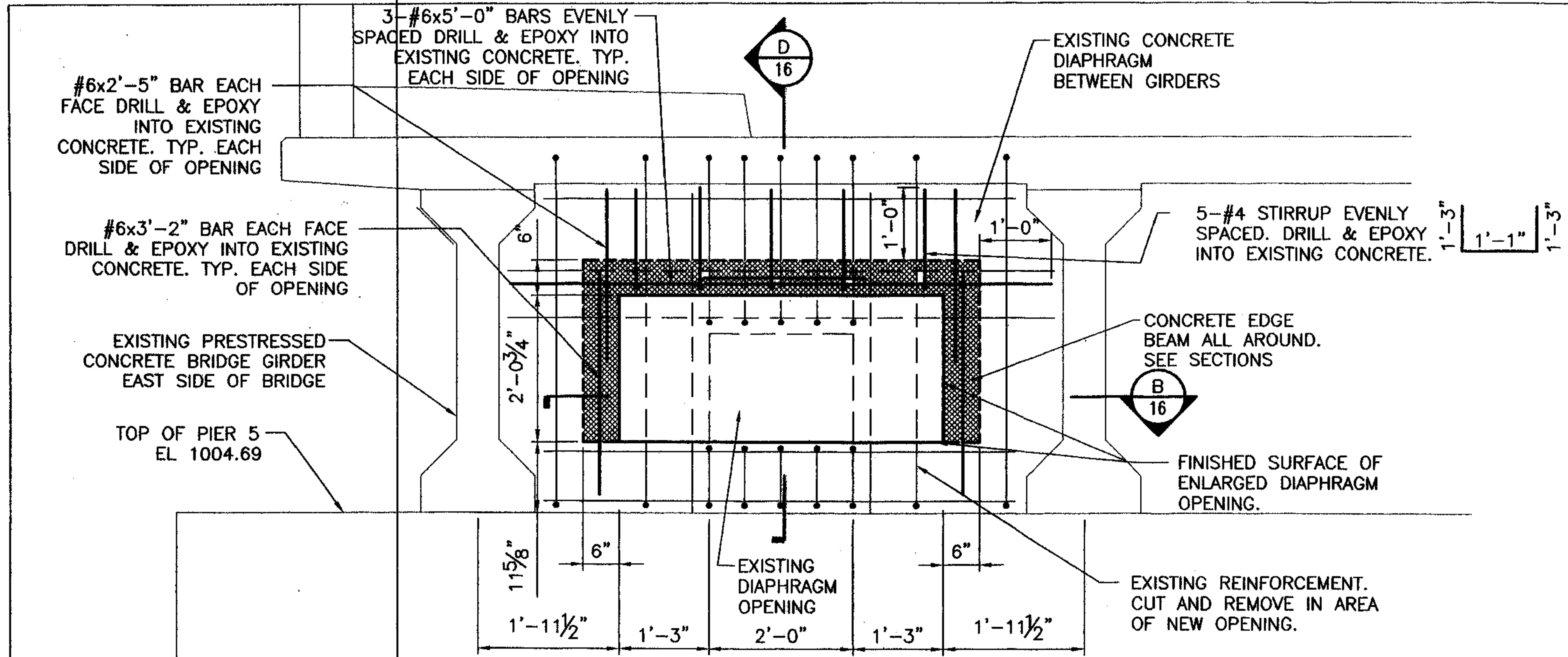
OCT 3 1 2007

SEE NO. PAGE SHEET

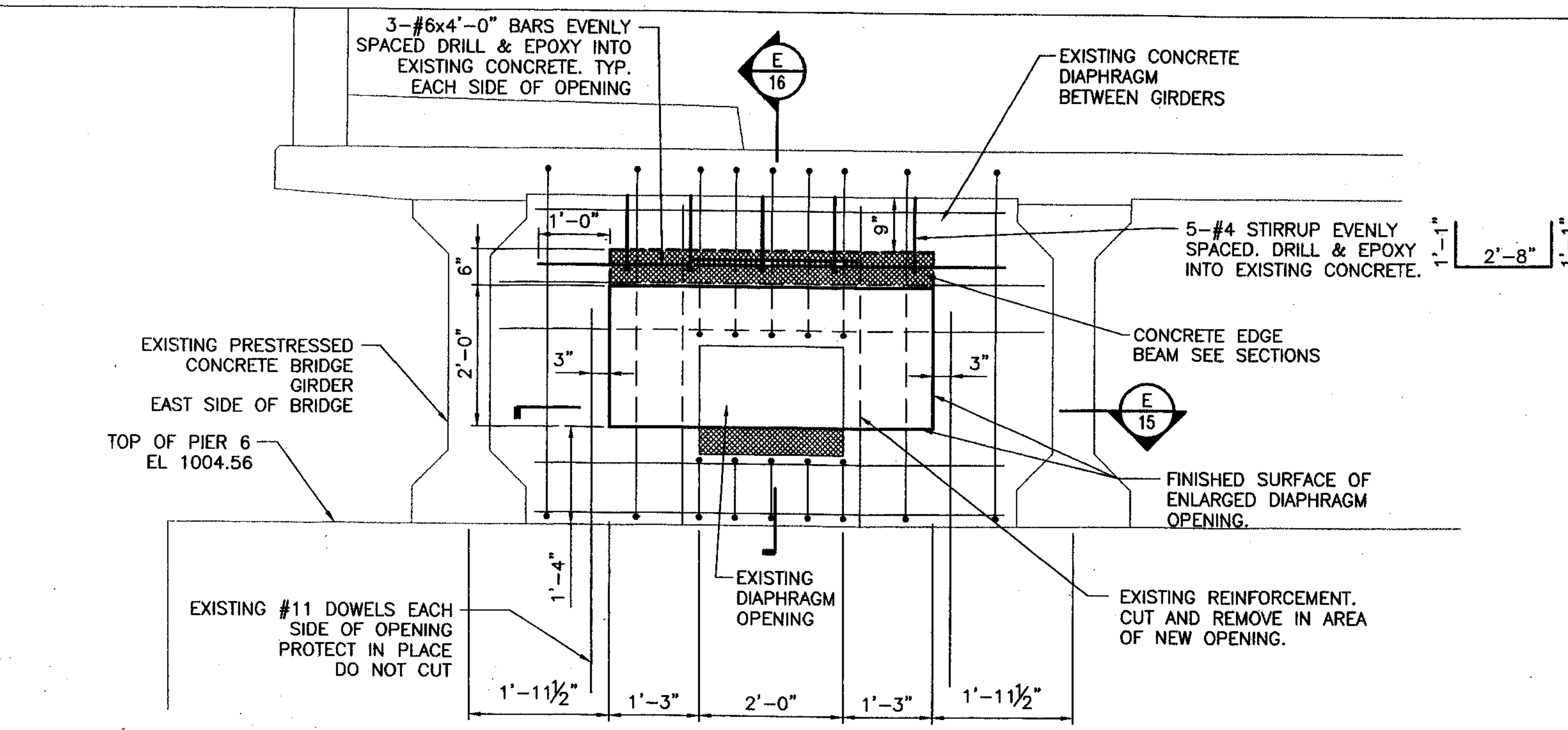


PIER 3 DIAPHRAGM AT EXPANSION JOINT

REINFORCEMENT SHOWN IS TYPICAL IN 2 DIAPHRAGMS. ONE ON EACH SIDE OF EXPANSION JOINT. SEE SECTIONS

SECTION (A/14)

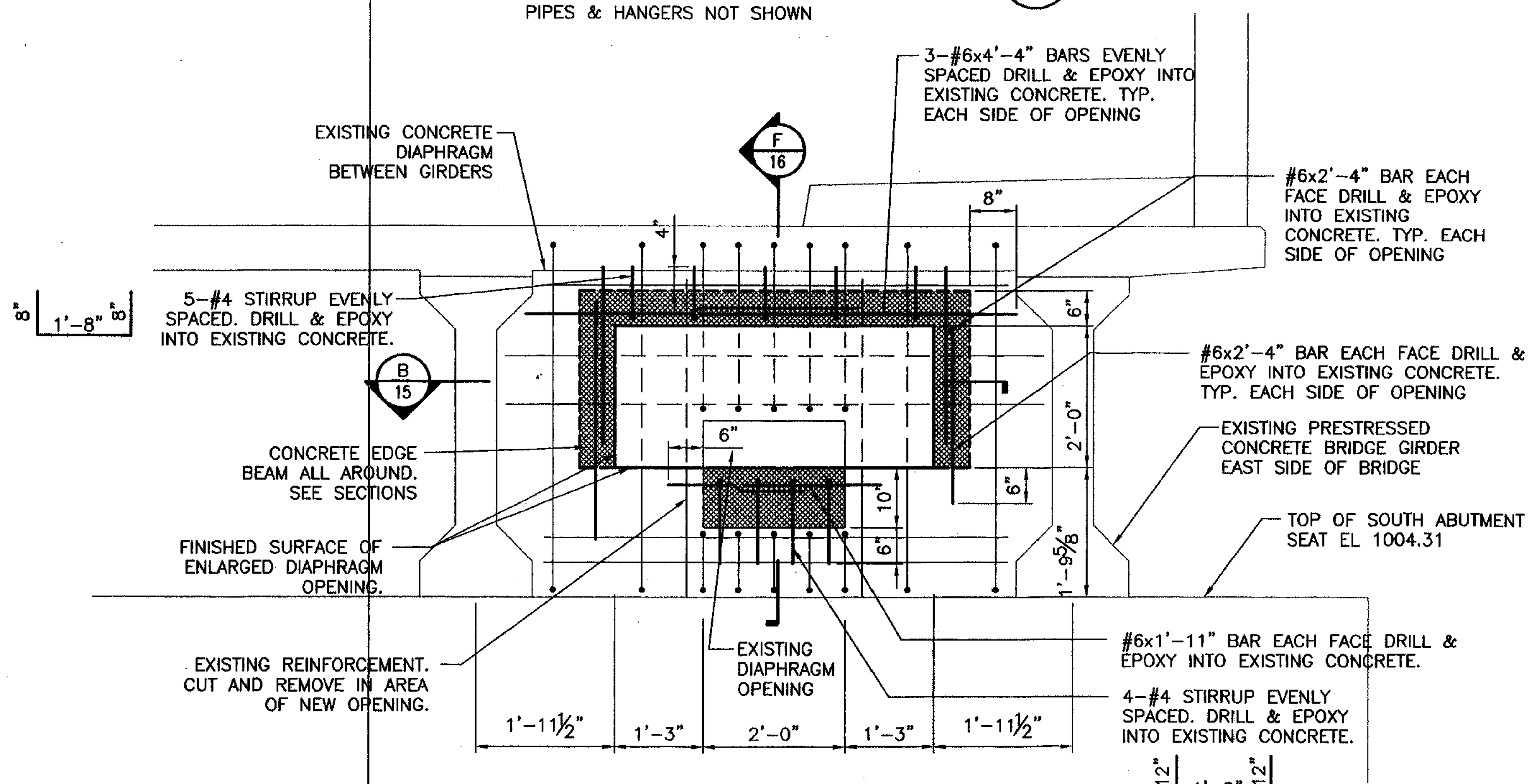
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



PIER 2 DIAPHRAGM

SECTION (B/14)

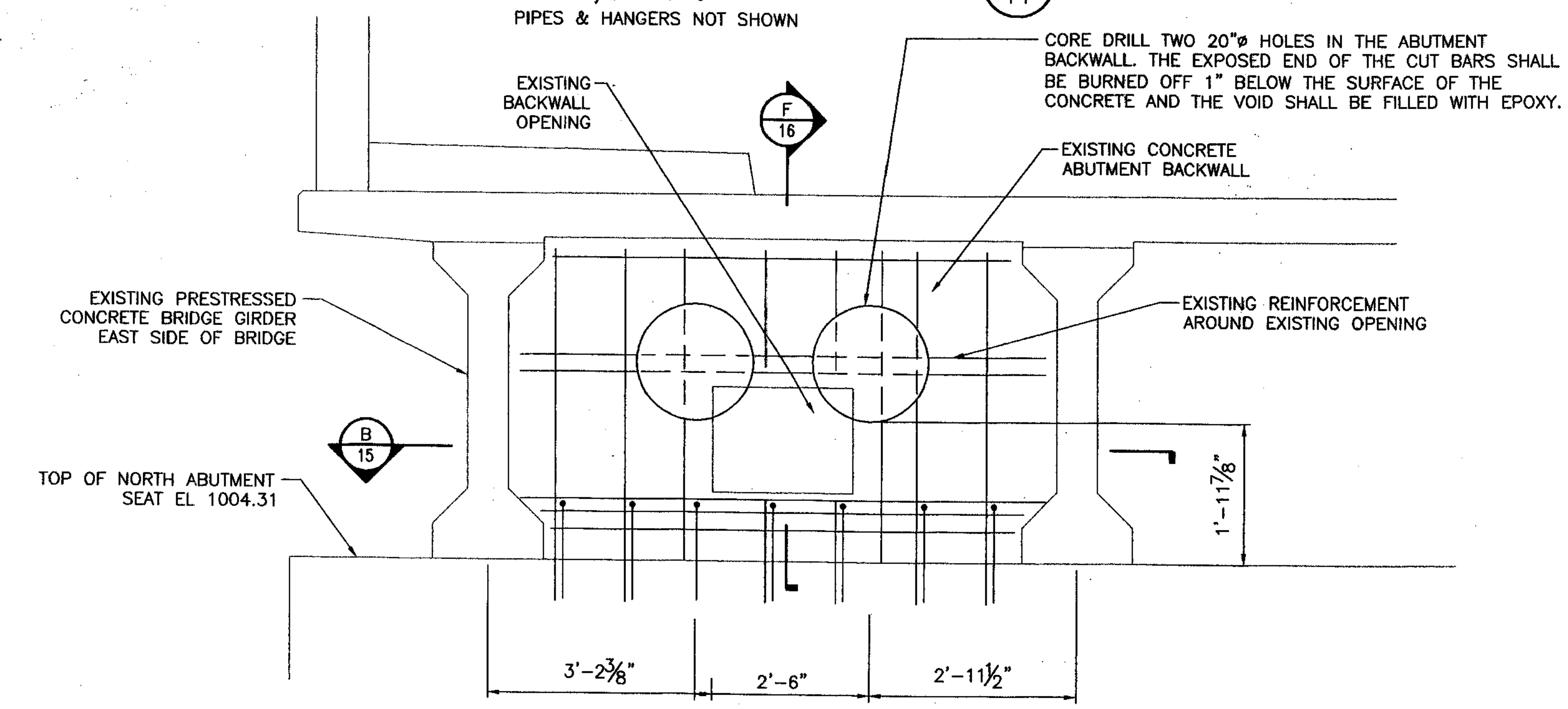
SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



NORTH ABUTMENT DIAPHRAGM
ABUTMENT 1

SECTION (C/14)

SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN



NORTH ABUTMENT
BACKWALL

SECTION (D/14)

SCALE: 3/4" = 1'-0"
PIPES & HANGERS NOT SHOWN

T.G.P.4549 GRID H1

18" DIP BRIDGE CROSSING SECTIONS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

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TEL: (760) 431-9896
E-MAIL: cwhitteker@allianceeng.com

R2H ENGINEERING, INC.
CONSULTING STRUCTURAL ENGINEERS
17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

REVIEWED DESIGN DIVISION
BY [signature] 10-25-07
STRUCTURES & SECTION

REVIEWED LAND DEVELOPMENT DIVISION
BY [signature] 10-25-07
SEWER AND WATER/LANDSCAPING SECTION DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/08 STRUCTURAL STATE OF CALIFORNIA

[signature] 10/15/07
PROJECT ENGINEER DATE

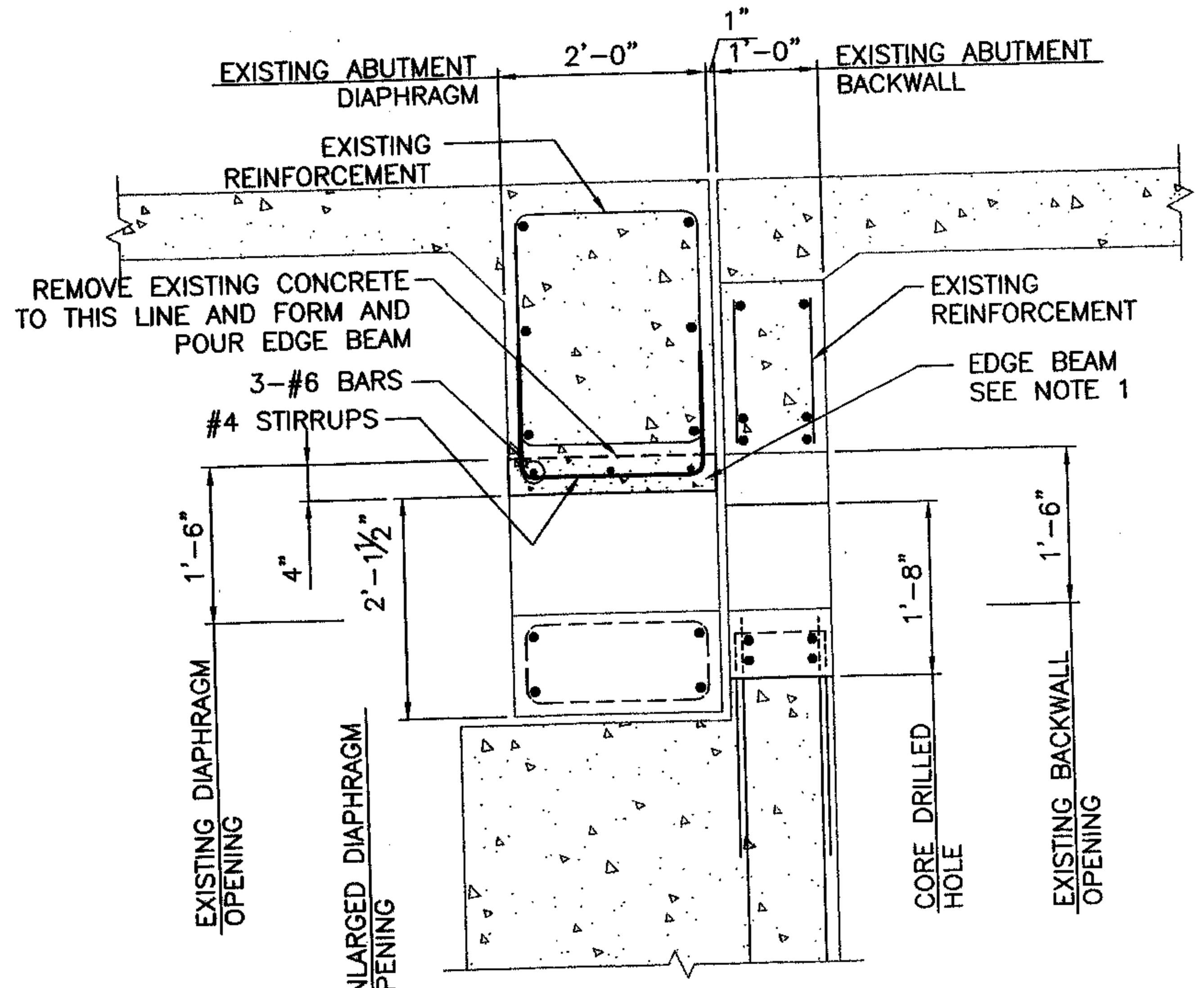
TRACT NO. 26363

NOV 0 7 2007

OCT 3 1 2007

P.C. 11497 PARCEL MAP NO. 26363

P.C. 11994 PARCEL MAP NO. 26363 (15)



SOUTH ABUTMENT

SECTION (A/15)
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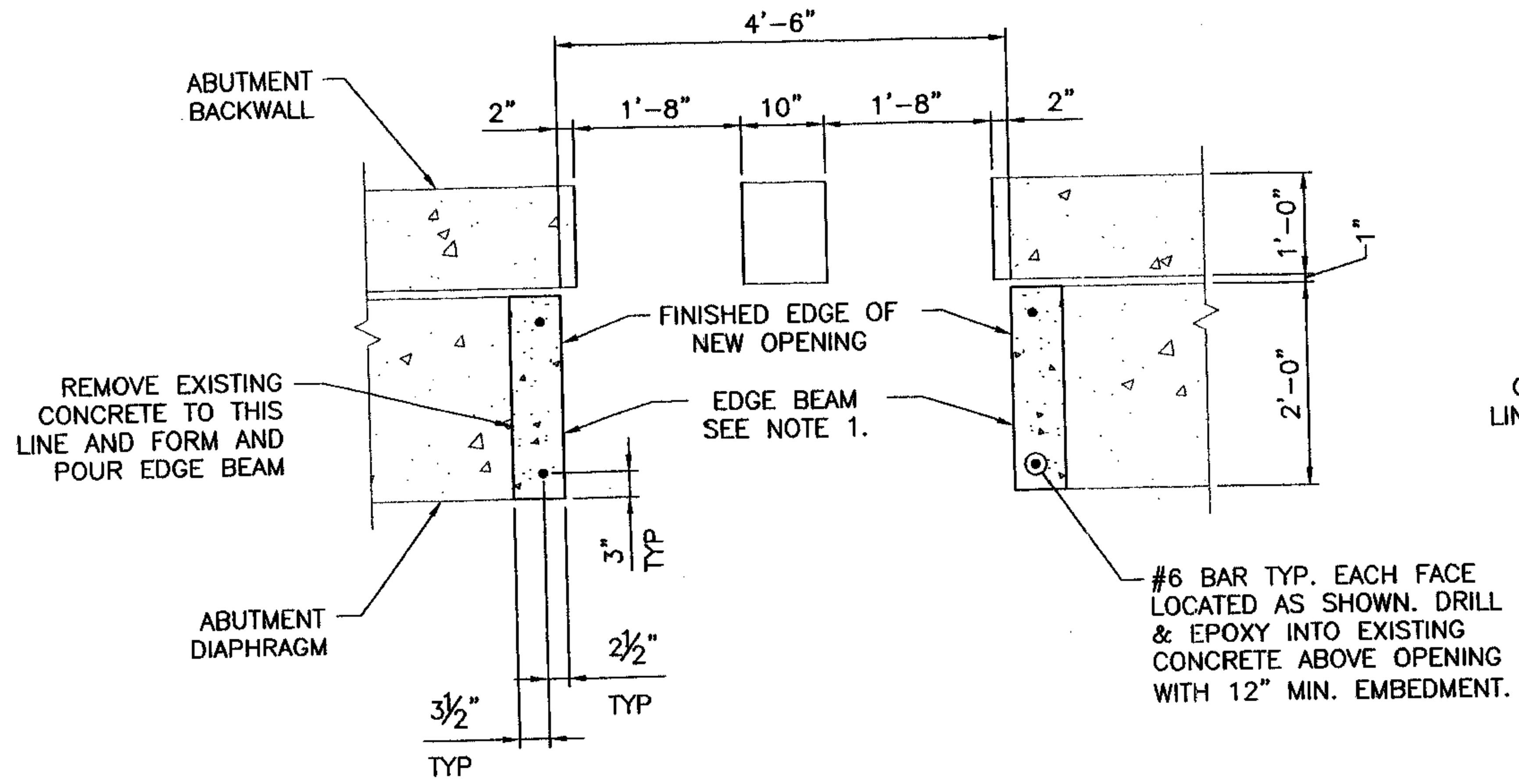

ABUTMENTS

SECTION (B/15)
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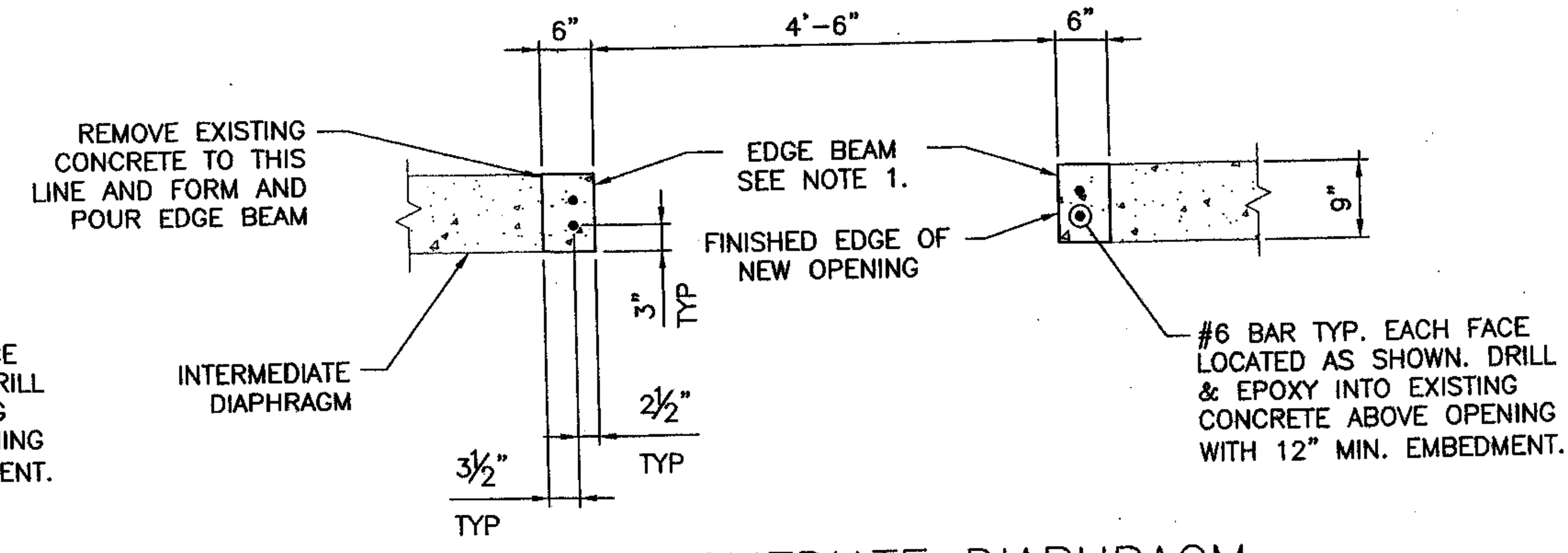

INTERMEDIATE DIAPHRAGM

SECTION (G/15)
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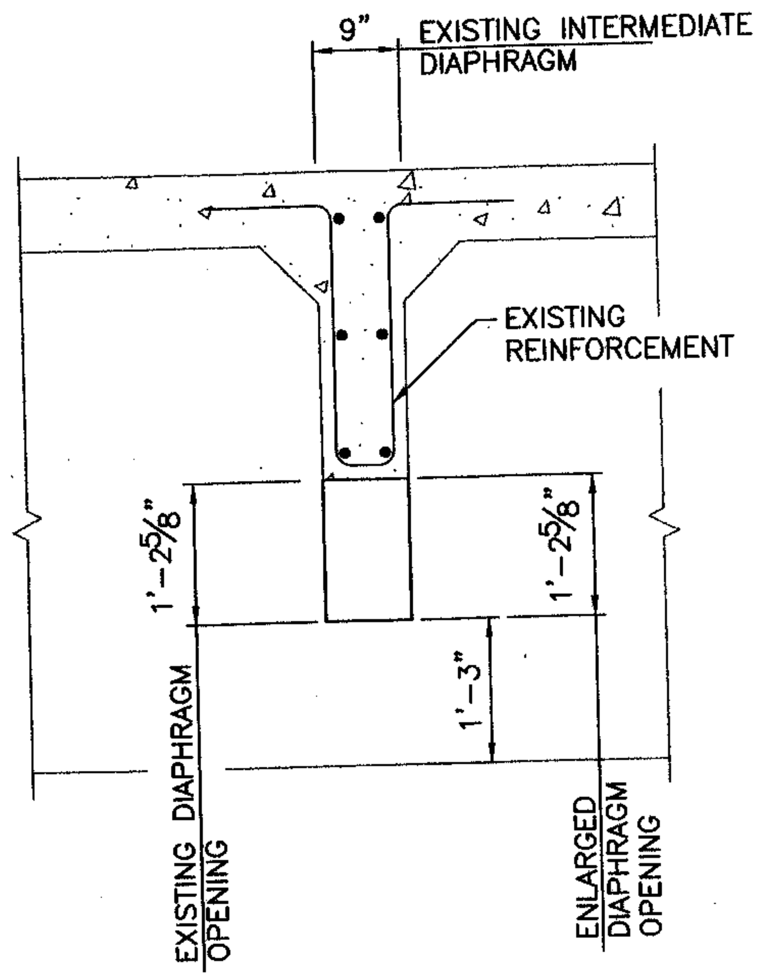

INTERMEDIATE DIAPHRAGM

SECTION (C/15)
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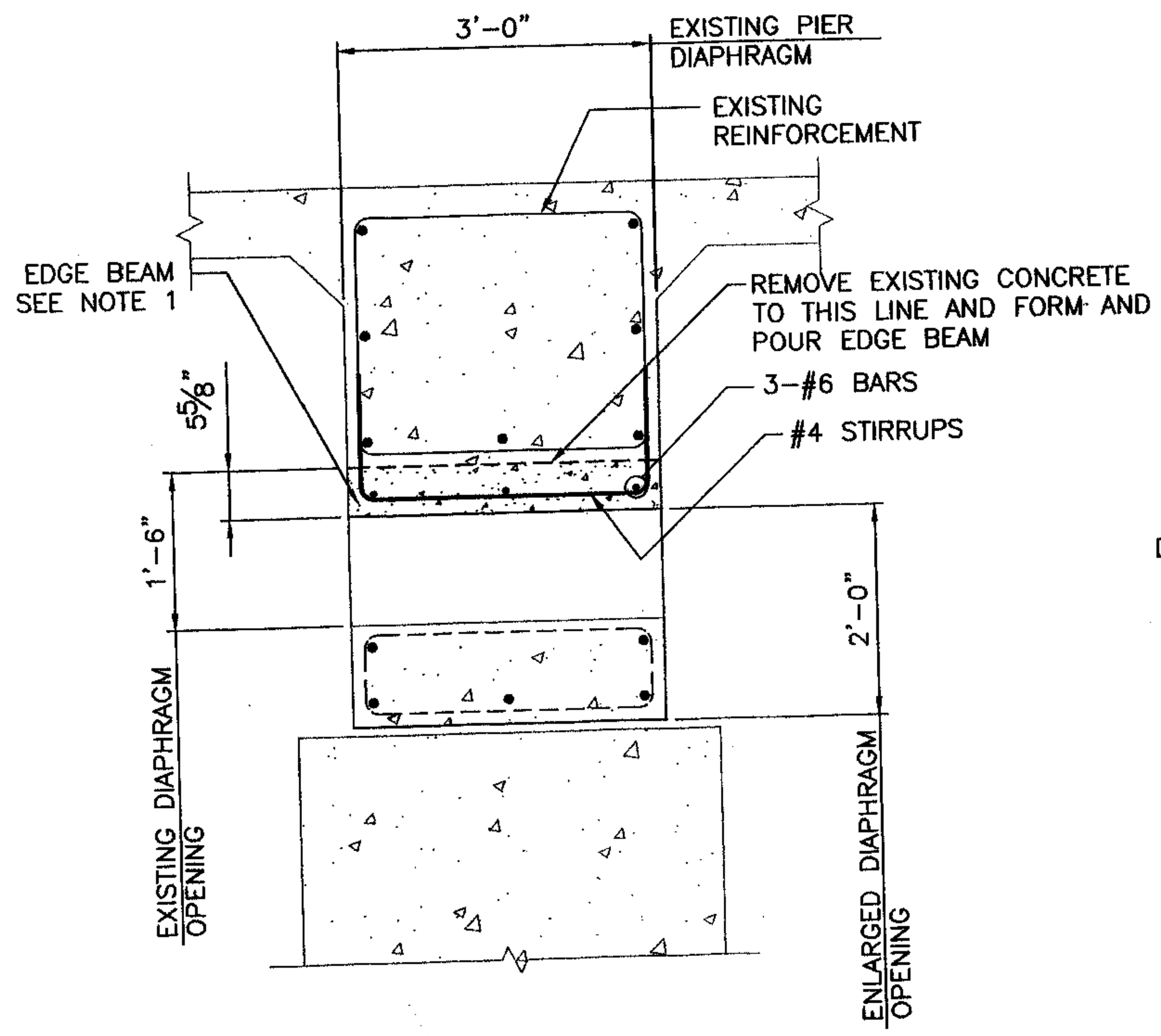

FIXED PIER

SECTION (D/15)
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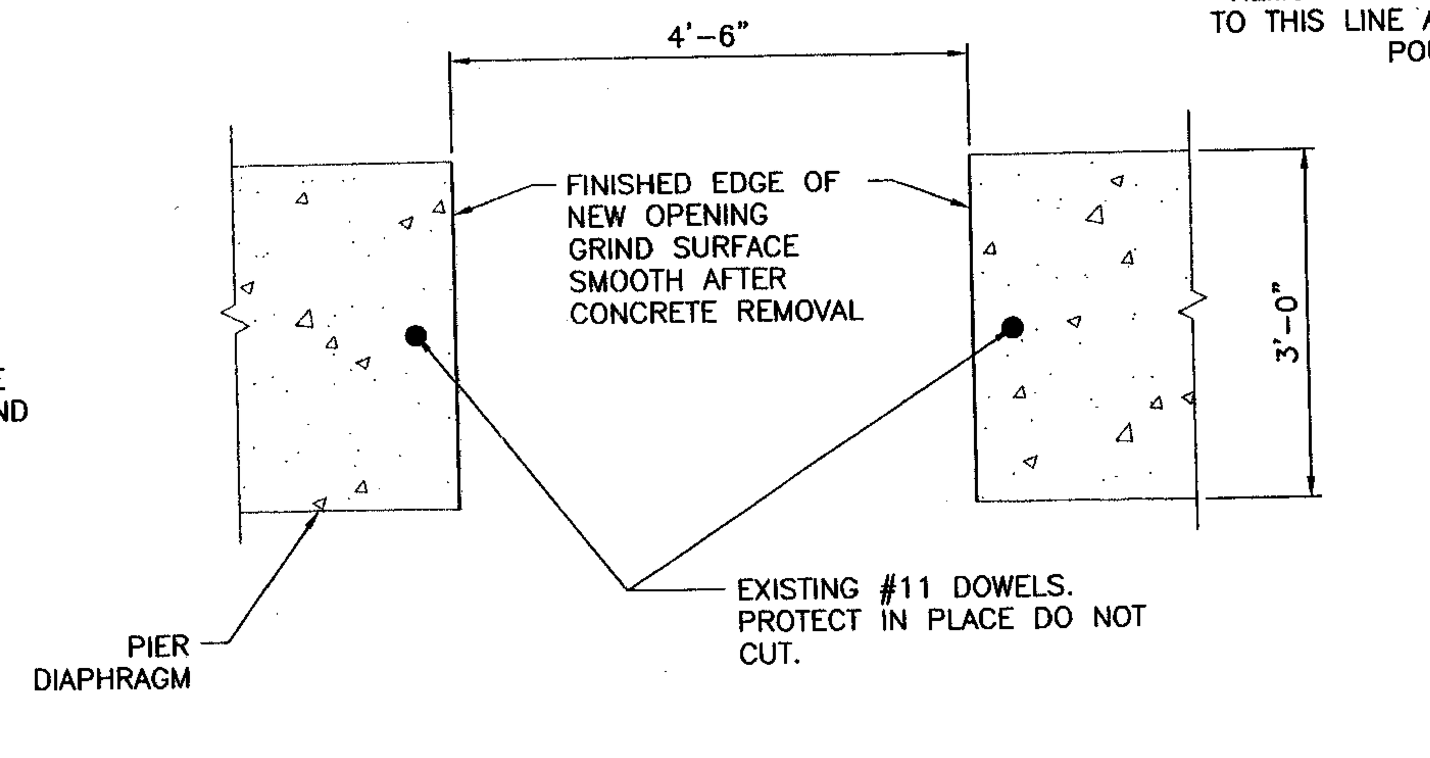

FIXED PIER

SECTION (E/15)
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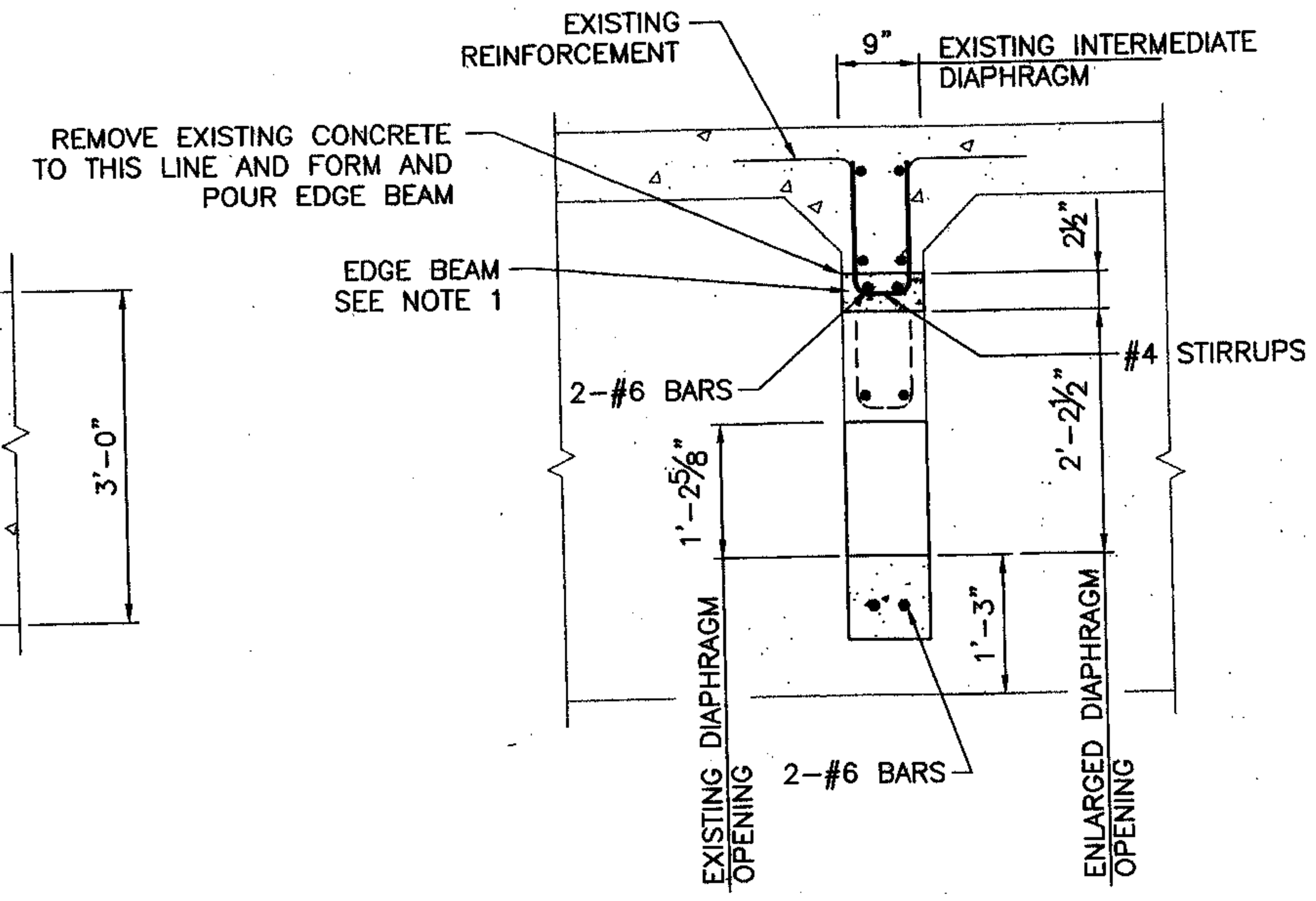

INTERMEDIATE DIAPHRAGM

SECTION (F/15)
SCALE: 3/4" = 1'-0"

NOTES

1. CONCRETE FOR EDGE BEAMS SHALL BE A 4000 PSI MIX WITH ⅜" MAXIMUM AGGREGATE SIZE. THE CONCRETE SHALL HAVE A MAXIMUM SLUMP OF 2". A SUPERPLASTICIZER SHALL BE ADDED BEFORE PLACING THE CONCRETE TO INCREASE THE SLUMP TO 8".

T.G.P.4549 GRID H1

18" DIP BRIDGE CROSSING SECTIONS

SANITARY SEWER PLANS

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

R2H ENGINEERING, INC.
CONSULTING STRUCTURAL ENGINEERS
17150 VIA DEL CAMPO, SUITE 306
SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

REVIEWED DESIGN DIVISION
BY [signature] STRUCTURES & SECTION 10-25-07 DATE

REVIEWED LAND DEVELOPMENT DIVISION
BY [signature] SEWER AND WATER/LANDSCAPING SECTION 10-26-07 DATE

REGISTERED PROFESSIONAL ENGINEER
DANIEL WEINGART
No. S3616
Exp. 6/30/09
STRUCTURAL
STATE OF CALIFORNIA

PROJECT ENGINEER DATE

PLANS PREPARED BY:

ALLIANCE
LAND PLANNING & ENGINEERING INC.
5962 LAPLACE CT.
SUITE 130
CARLSBAD, CA 92008
TEL: (760) 431-9896
E-MAIL: cwhittaker@allianceeng.com

TRACT NO. 26363

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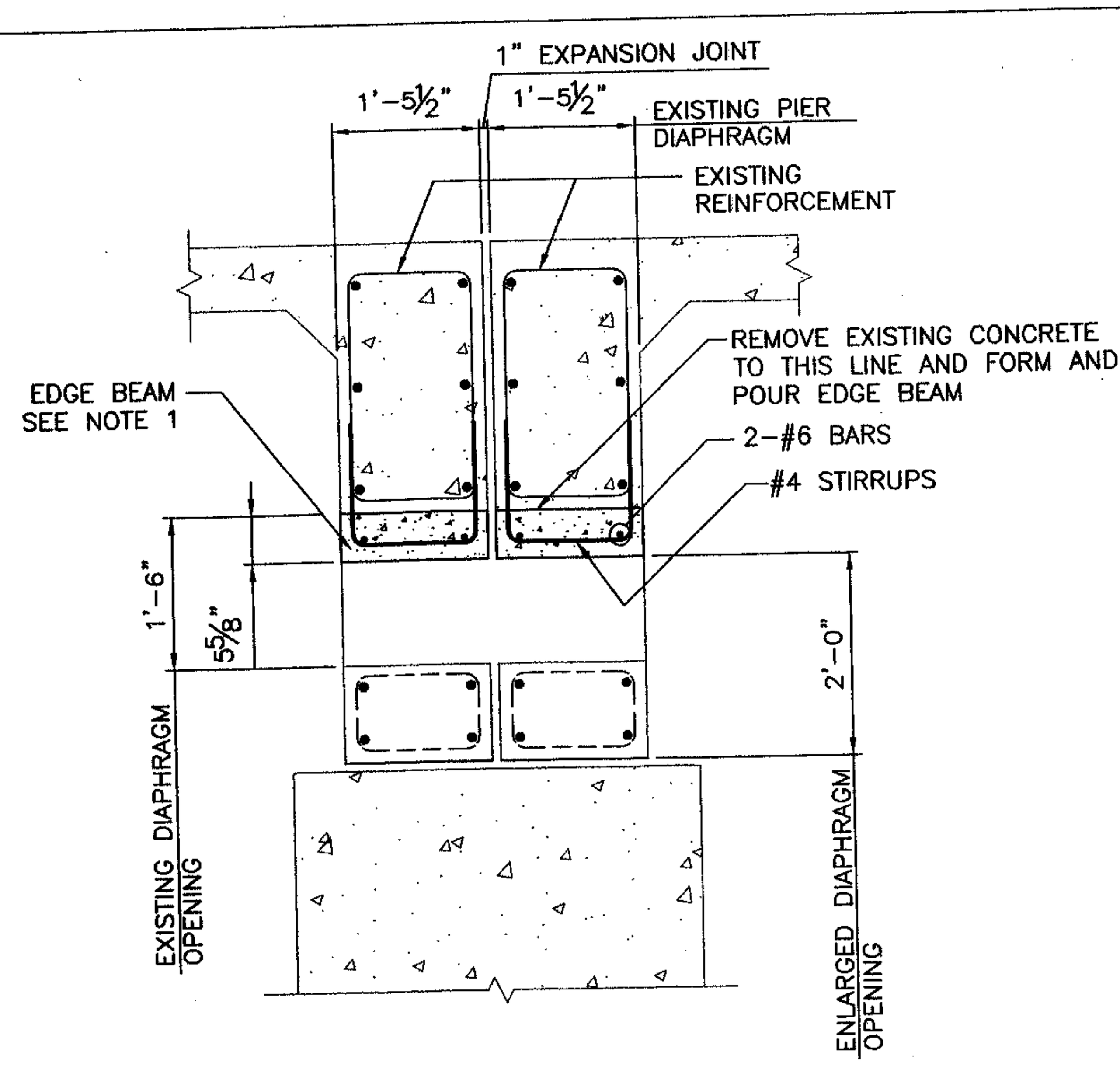
NOV 0 7 2007

OCT 3 1 2007



EXPANSION PIER

SECTION (A/16)
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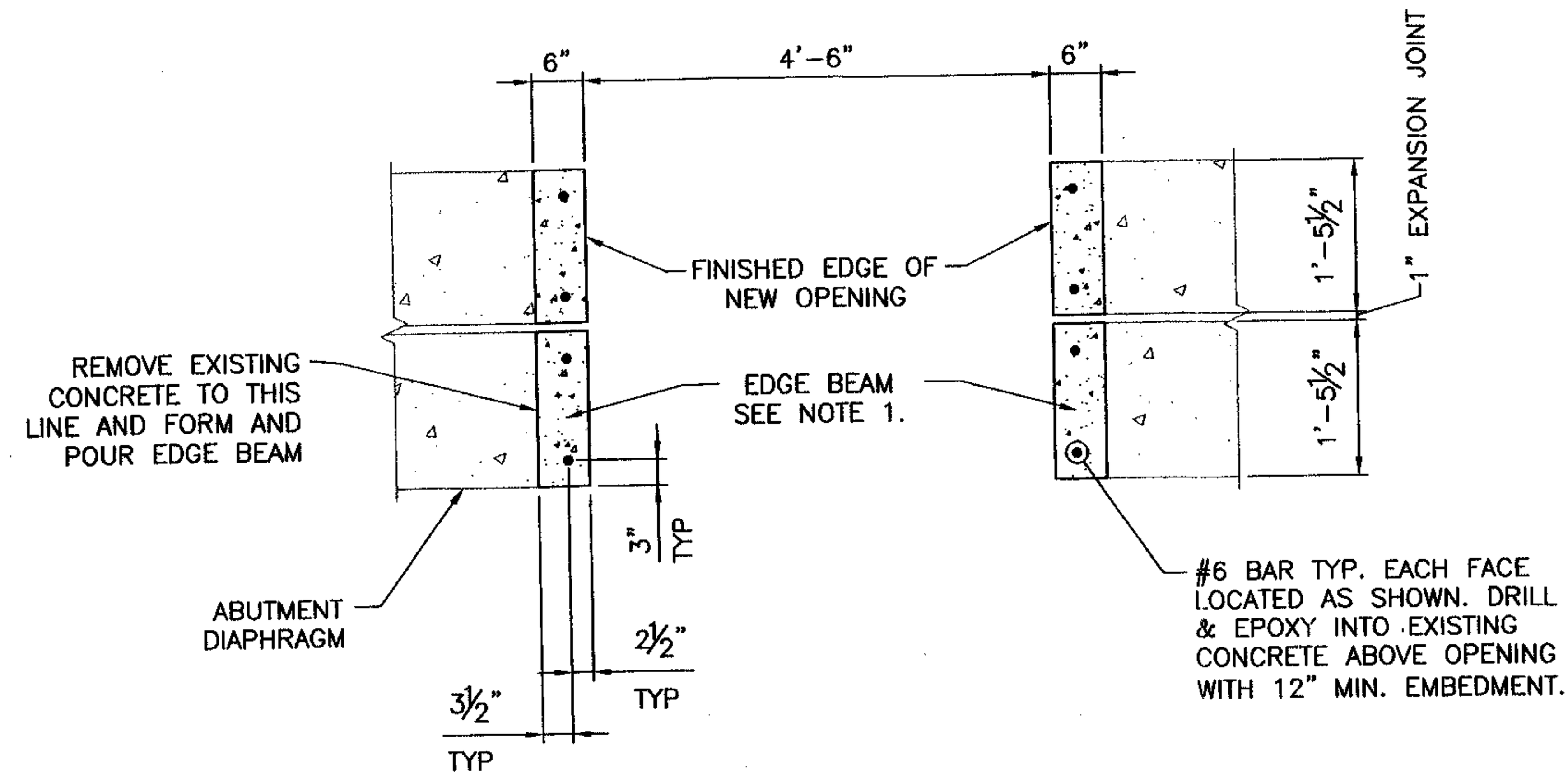

EXPANSION PIER

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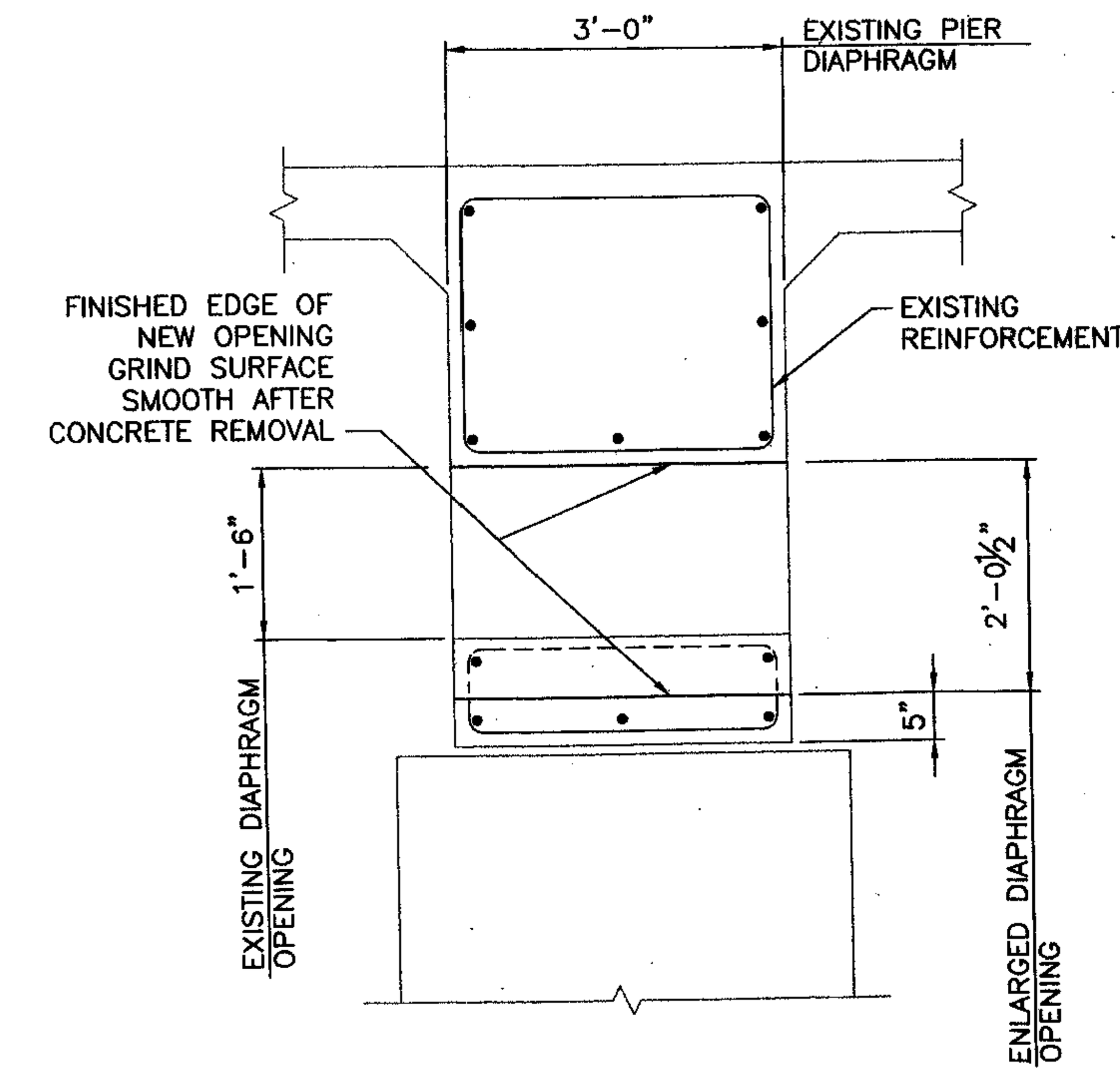

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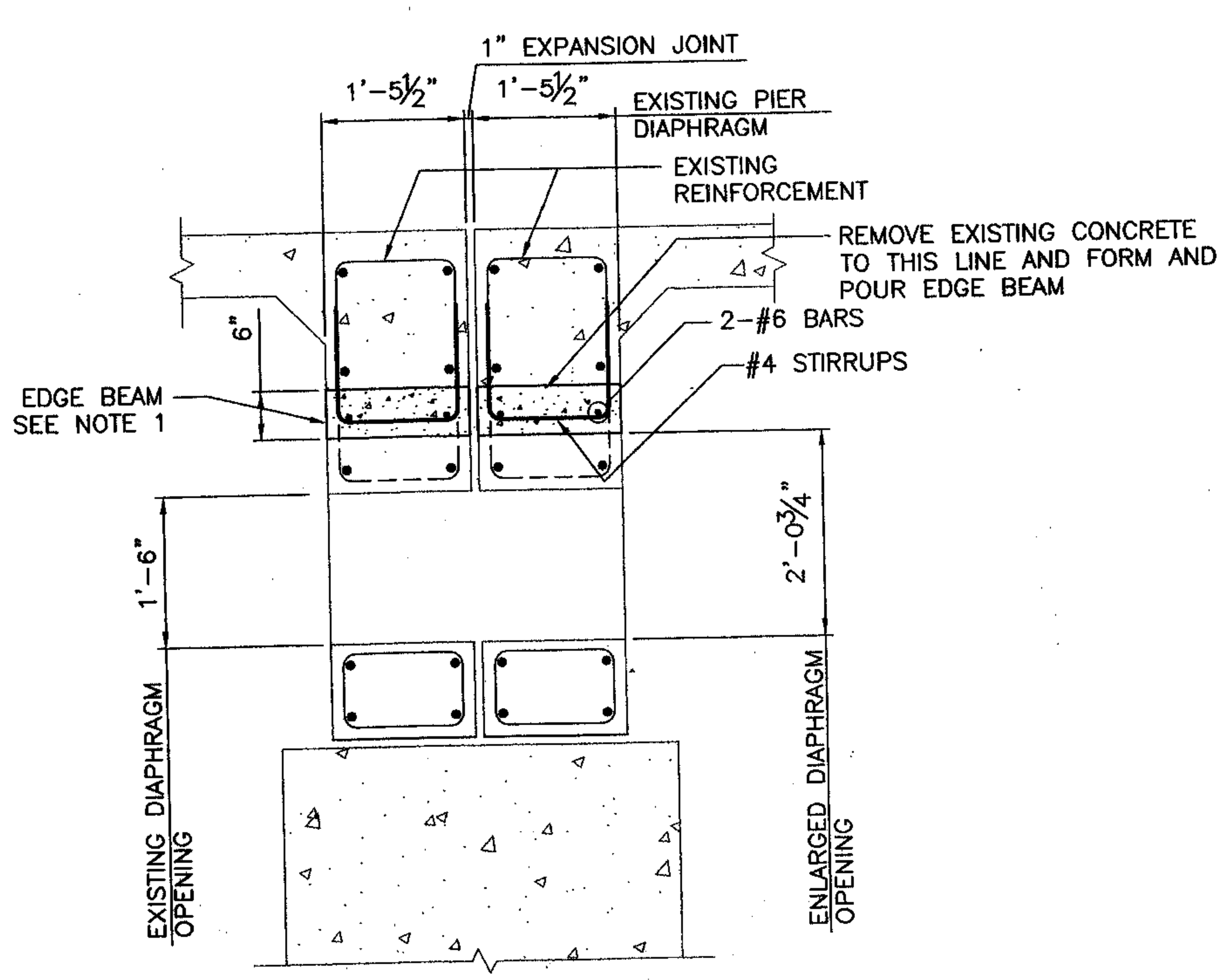

EXPANSION PIER

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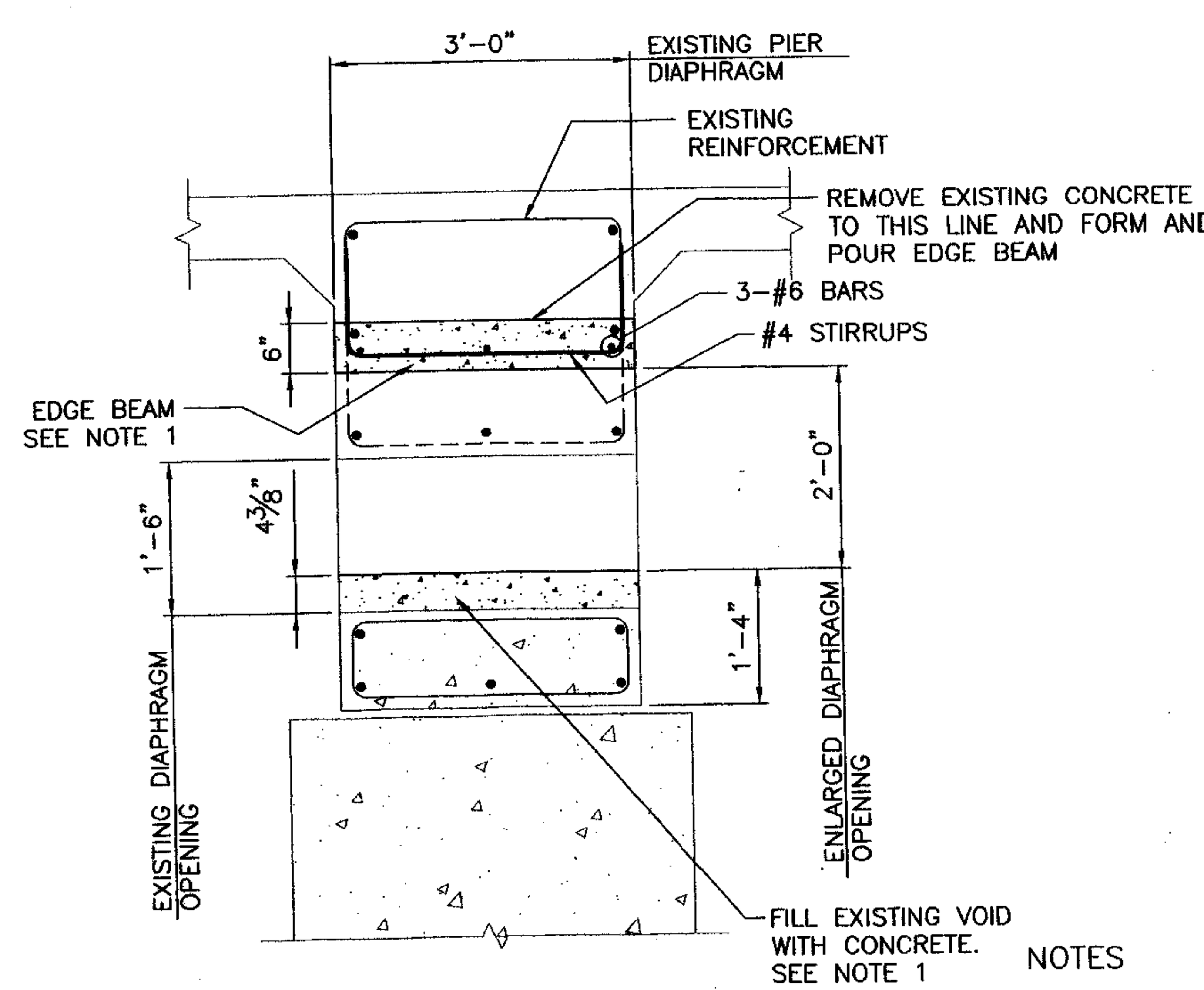

FIXED PIER

SECTION (E/16)
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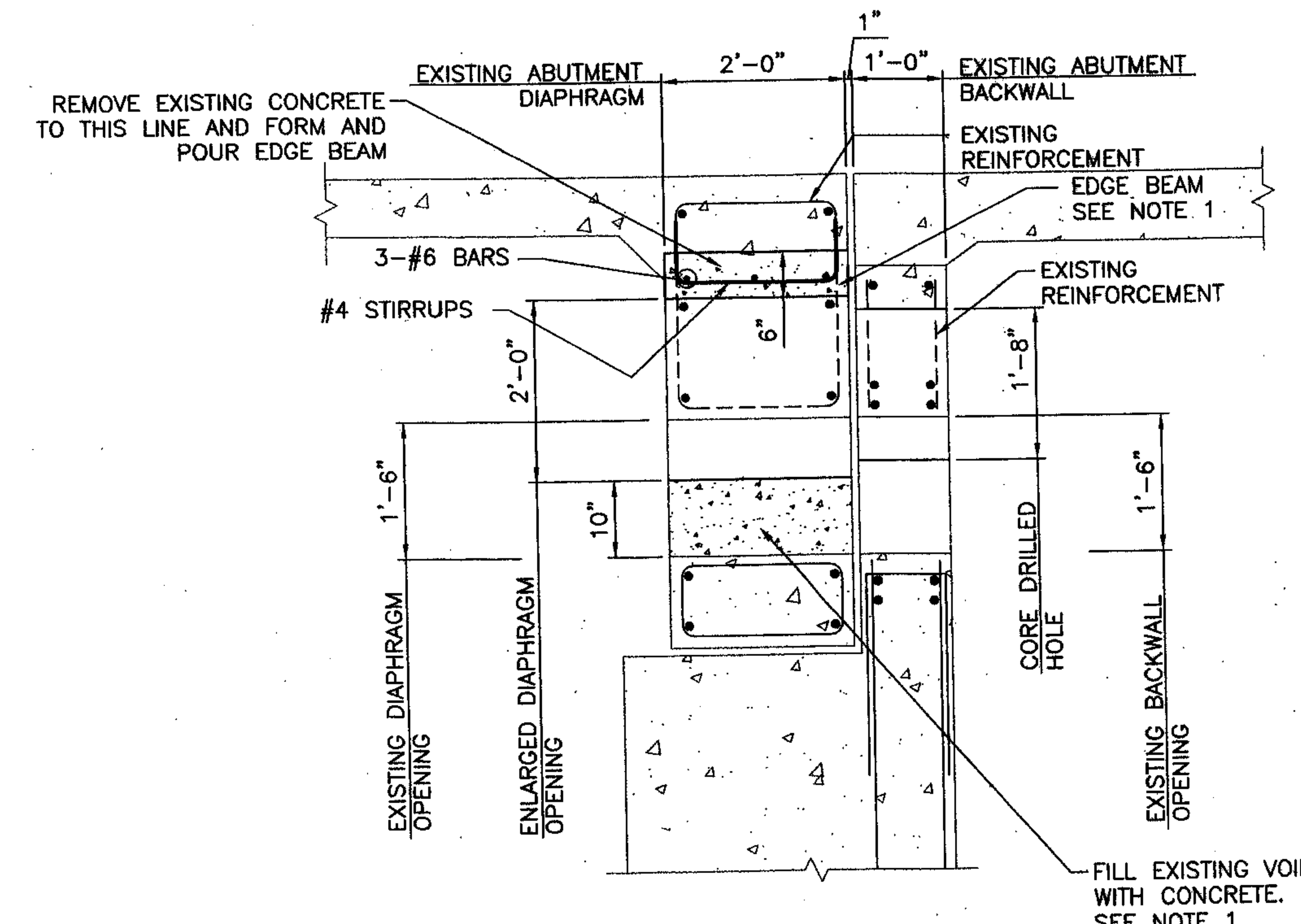

NORTH ABUTMENT

SECTION (F/16)
SCALE: 3/4" = 1'-0"

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T.G.P. 4549 GRID H1

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SANITARY SEWER PLANS

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PLANS PREPARED BY:
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TRACT NO. 26363

PAGE 17

NOV 0 7 2007

OCT 3 1 2007

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REGISTERED PROFESSIONAL ENGINEER DANIEL WEINGART No. S3616 Exp. 6/30/08 STRUCTURAL STATE OF CALIFORNIA

PROJECT ENGINEER DATE

REVIEWED DESIGN DIVISION
BY STRUCTURES I SECTION 10-25-07 DATE

REVIEWED LAND DEVELOPMENT DIVISION
BY SEWER AND WATER/LANDSCAPING SECTION 10-25-07 DATE

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SAN DIEGO, CA 92127
PHONE (858) 673-8416
FAX (858) 673-8418

P.C. 11891 PARCEL MAP NO. 2823 (E)

COUNTY SANITATION DISTRICT Nº 32
OF LOS ANGELES COUNTY, CALIF.
OFFICE OF CHIEF ENGINEER

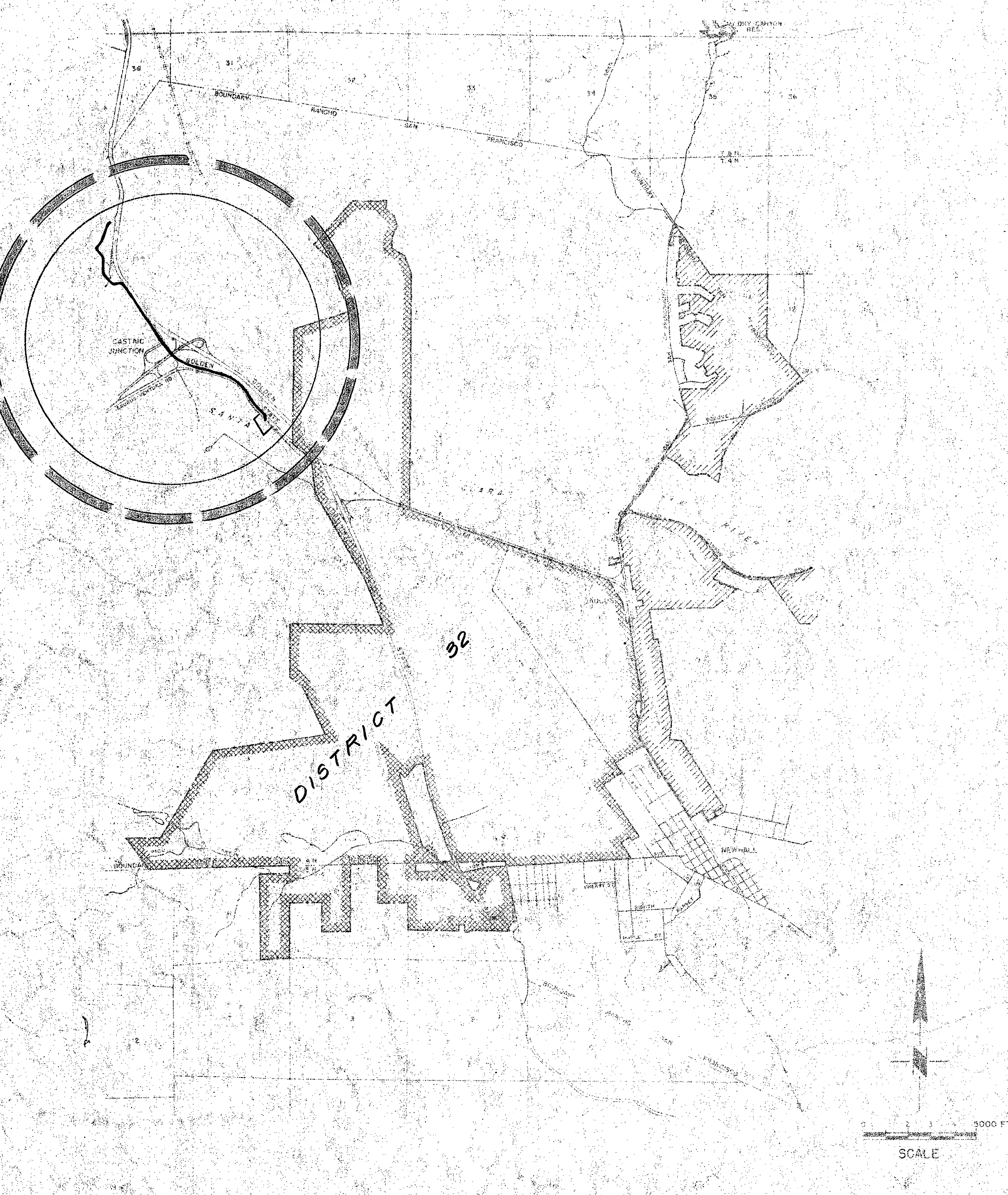
CONTRACT DRAWINGS

CASTAIC TRUNK SEWER SECTIONS 1,2 & 3 AND CASTAIC PUMPING PLANT FORCE MAIN

SUBMITTED G. Posthumus (OFFICE ENGINEER) DATED MAY 12, 1970

RECOMMENDED W.E. Garrison (ASST. CHIEF ENGINEER) DATED MAY 12, 1970

APPROVED John D. Parkhurst (CHIEF ENGINEER) DATED MAY 12, 1970



LEGEND

PROPOSED TRUNK SEWER	
EXISTING " "	
FUTURE " "	
EXISTING LATERAL	
WATER LINE	W
GAS "	G
OIL "	O
PIPE "	P
TELEPHONE CONDUIT	
ELECTRICAL	
TELEPHONE POLE & DEAD MAN	TP DM
POWER " " "	PP
LIGHT "	
FIRE HYDRANT	FH
WATER & GAS VALVE	WV GV
" " " METER	WM GM
FENCE	
PAVING	
CURB, PARKWAY & SIDEWALK	
C.S.D. BOUNDARY	C.S.D. NO 32 | C.S.D. NO 26
CITY "	
RIGHT OF WAY	
BENCH MARK	
PLAN & PROFILE SHEET INDEX	(2)

GENERAL NOTES

3 ~~1 - ELEVATIONS ARE IN FEET ABOVE U.S.G.S. OR MEAN SEA LEVEL DATUM.~~

2 - ALL UTILITIES AFFECTED BY CONSTRUCTION OF TRUNK SEWER AND APPURTENANT WORK SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION.

3 - UNLESS OTHERWISE NOTED, PERMITS FOR EXCAVATION WILL BE OBTAINED BY THE DISTRICT. ALL COSTS FOR COMPLYING WITH SPECIAL REQUIREMENTS IN THE EXCAVATION PERMIT OBTAINED BY THE DISTRICT, INCLUDING INSPECTION, TRAFFIC CONTROL, REPAIRS, LIGHTS, SIGNS, STRIPING, OR ANY OTHER REQUIREMENTS OF THE PERMIT, SHALL BE BORNE BY THE CONTRACTOR.

4 - THE CONTRACTOR SHALL PLACE TEMPORARY RESURFACING OF 2-INCH PREMIX OVER ALL CUTS IN PAVEMENT. SEE ADDENDUM TO STANDARD SPECIFICATIONS DATED OCT. 28, 1964, CHANGE NO. 5.

5 - INSPECTION FEES FOR REPAVING REQUIRED BY LOCAL AUTHORITIES SHALL BE PAID BY THE DISTRICT.

6 - UNLESS OTHERWISE SPECIFIED ON THE DRAWINGS, ALL TRENCH REPAVING SHALL BE MADE WITH THE TYPE OF PAVING REMOVED PLUS 1" OF THICKNESS OR WITH AN EQUIVALENT PAVEMENT AS DIRECTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

7 - ALL ASPHALTIC TYPE REPAVING TO BE SEALED WITH 1/4 GALLON EMULSION PER SQUARE YARD AND COVERED WITH Nº 5 ROCK UNLESS OTHERWISE SPECIFIED. ALL CONCRETE TO BE CUT WITH DIAMOND SAW TO MINIMUM DEPTH OF 1/3 THE THICKNESS OF EXISTING PAVEMENT.

8 - ATTENTION IS DIRECTED TO SECTION 37 OF THE STANDARD SPECIFICATIONS WHICH REQUIRES THAT "ALL STREETS OR ALLEYS IN WHICH THE SURFACE IS REMOVED, BROKEN OR DAMAGED OR IN WHICH THE GROUND HAS CAVED-IN OR SETTLED DUE TO THE INSTALLATION OF THE IMPROVEMENT, SHALL BE RESURFACED AND BROUGHT TO THE ORIGINAL GRADE AND CROWN SECTION" AND "IN ALL CASES THE REPAVING AND REPAIRING SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION IN THE AREA OF THE WORK." THE CONTRACTOR IS CAUTIONED THAT THE AUTHORITIES HAVING JURISDICTION MAY REQUIRE THAT THE ENTIRE STREET BE REPAVED IF AN EXCESSIVE AREA OF THE PAVEMENT HAS BEEN REMOVED OR DAMAGED.

9 - WHERE 6" STUBS ARE REQUIRED IN REINFORCED CONCRETE PIPE, THE MANUFACTURER SHALL PROVIDE HOLES BY BLOCKOUT PRIOR TO SPINNING OR CASTING THE JOINTS OF PIPE. STUBS TO BE PLACED 45° ABOVE HORIZONTAL.

10 - PAYMENT FOR ALL STUBS IN THE STRUCTURES SHOWN ON THE PLANS SHALL BE MADE UNDER THE APPROPRIATE PIPE ITEM FOR THE SAME SIZE AND STRENGTH. IF NO PIPE ITEM EXISTS WITH THE SAME SIZE AND STRENGTH, THEN PAYMENT FOR SAID STUBS SHALL BE MADE UNDER THE ITEM BID FOR THE STRUCTURE.

11 - WHERE THE MAXIMUM ALLOWABLE TRENCH WIDTHS HAVE BEEN EXCEEDED AND WHERE REINFORCED CONCRETE PIPE HAS BEEN SPECIFIED ON THE PLAN, THE CONTRACTOR HAS THE OPTION, IN ACCORDANCE WITH SECTION 25, STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF SEWERS AND APPURTENANCES, OF EITHER SUBSTITUTING AT HIS EXPENSE, REINFORCED CONCRETE PIPE WITH D-LOAD STRENGTH SUFFICIENT TO CARRY THE ADDITIONAL TRENCH LOADS OR PLACING THE PIPE SHOWN ON THE PLANS WITH THE NECESSARY SPECIAL BEDDING.

12 - BEFORE ANY PIPE IS DELIVERED TO THE SITE OF THE WORK THE CONTRACTOR SHALL FIRST OBTAIN APPROVAL FROM THE ENGINEER OF THE ROUTES THAT SHALL BE USED BY THE PIPE DELIVERY TRUCKS, BOTH COMING AND GOING IN THE VICINITY OF THE WORK. THERE SHALL ALSO BE SUBMITTED FOR APPROVAL A SCHEDULE OF PIPE DELIVERY AND PLACING ALONGSIDE OF THE TRENCH.

13 - ALL EXCESS DIRT, UNLESS OTHERWISE INDICATED ON THE PLANS, SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AT HIS EXPENSE. HOWEVER, IF THE PROPERTY OWNER DESIRES THE DIRT TO REMAIN ON THE PROPERTY, THE PLANS WILL SO INDICATE AND THE CONTRACTOR SHALL EITHER STOCK-PILE OR SPREAD THE EXCESS DIRT ADJACENT TO THE WORK AS DIRECTED BY THE ENGINEER.

14 - ALL CONCRETE FOR STRUCTURES SHALL BE CLASS "A" UNLESS OTHERWISE SPECIFIED.

15 - THE OCCUPATIONAL RIGHTS OF WAY OBTAINED BY THE DISTRICT ARE SHOWN ON THE DRAWINGS. PAYMENT FOR LOSSES OR DAMAGE TO CROPS WITHIN THE OCCUPATIONAL RIGHTS OF WAY OBTAINED BY THE DISTRICT WILL BE PAID BY THE DISTRICT. REMOVAL AND REPLACING WHERE NECESSARY OF SURFACE OR SUBSURFACE OBSTRUCTIONS OR IMPROVEMENTS WITHIN THE OCCUPATIONAL RIGHTS OF WAY OBTAINED BY THE DISTRICT SHALL BE DONE BY THE CONTRACTOR AT HIS EXPENSE, BUT ONLY AFTER AUTHORIZATION IS GIVEN BY THE ENGINEER. IF ADDITIONAL OCCUPATIONAL RIGHTS OF WAY IS REQUIRED, THE CONTRACTOR SHALL ARRANGE FOR AND BEAR ALL OF THE COST OF THE ADDITIONAL OCCUPATIONAL RIGHTS OF WAY NECESSARY, INCLUDING ALL LOSS OR DAMAGE TO CROPS AND REMOVAL AND REPLACING OF SURFACE OR SUBSURFACE OBSTRUCTIONS OR IMPROVEMENTS.

16 - THE DISTRICT HAS DILIGENTLY ATTEMPTED TO CORRECTLY LOCATE AND SHOW ALL EXISTING PIPE LINES AND OTHER SUBSTRUCTURES IN THE VICINITY OF THE WORK, BUT THE DISTRICT DOES NOT GUARANTEE THAT THERE ARE NO OTHER SUBSTRUCTURES. FAILURE OF THE DISTRICT TO SHOW ALL OF THE SUBSTRUCTURES AND IN THEIR CORRECT LOCATIONS WILL NOT BE A BASIS FOR A CLAIM FOR EXTRA WORK AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO SUBSTRUCTURES WHETHER SHOWN OR NOT.

17 - BORINGS MADE BY THE DISTRICT TO DETERMINE GROUND CONDITIONS ARE AVAILABLE TO BIDDERS AT THE DISTRICTS' OFFICE. DISTRICT DOES NOT GUARANTEE THAT THE BORINGS REPRESENT THE GROUND CONDITIONS AS THEY ACTUALLY EXIST. THE BIDDER SHALL ASSUME FULL RESPONSIBILITY IN INTERPRETING THE DISTRICTS' BORINGS.

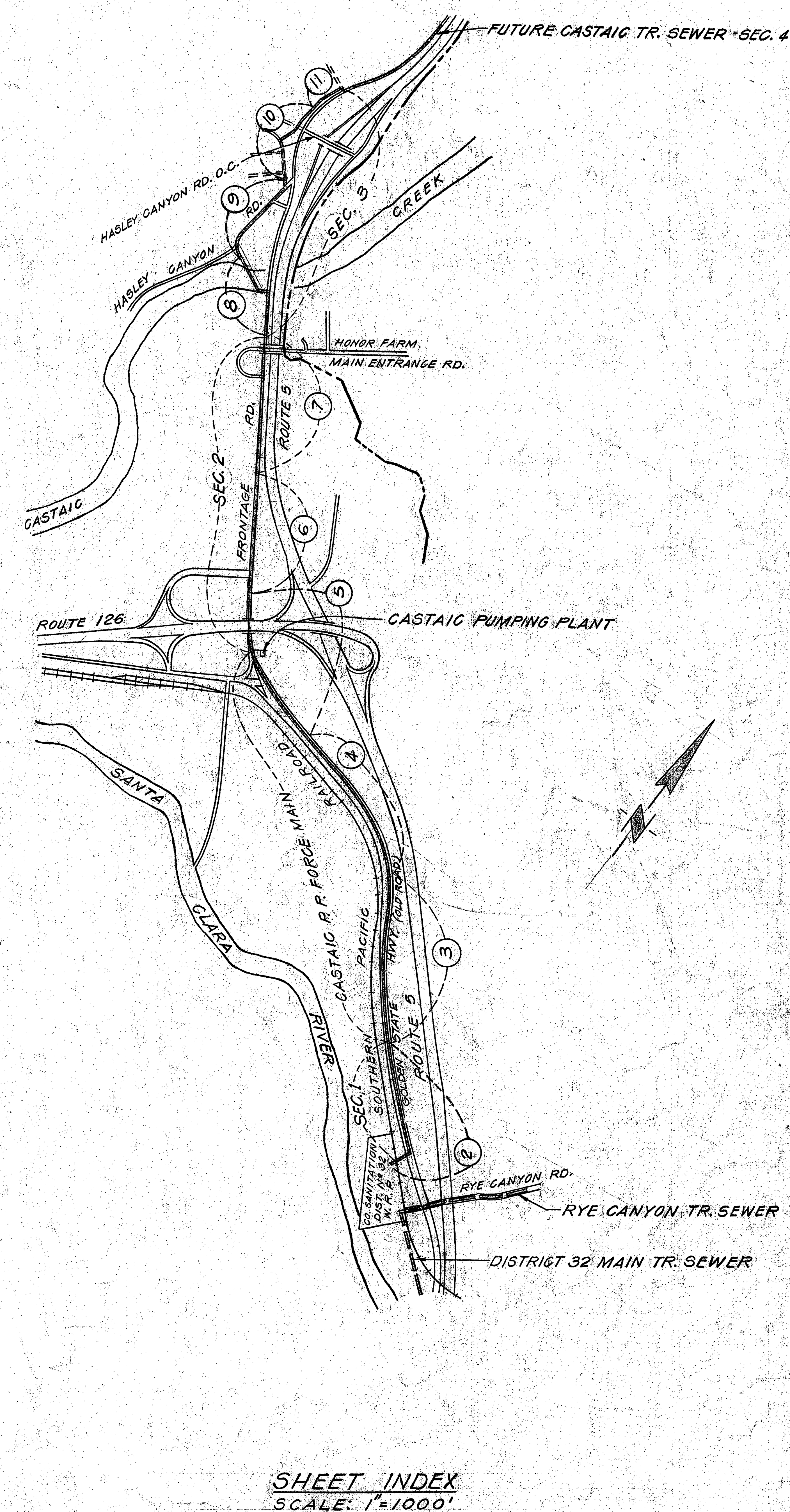
18 - TYPE "A" MANHOLES AND JUNCTION CHAMBERS SHALL CONFORM TO STD. DWG. S-a-201, TYPE "B" MANHOLES AND JUNCTION CHAMBERS SHALL CONFORM TO STD. DWG. S-a-202. TYPE "D" MANHOLES AND JUNCTION CHAMBERS SHALL CONFORM TO STD. DWGS. S-a-204C OR S-a-204D. STANDARD CONCRETE CRADLES AND ENCASEMENTS SHALL CONFORM TO STD. DWG. S-a-212; CONCRETE PIPE SUPPORTS SHALL CONFORM TO STD. DWG. S-a-217.

19 - IF THE CONTRACTOR IS REQUIRED TO REPLACE PAVING OR BASE MATERIAL OF GREATER THICKNESS THAN IS INDICATED ON THE DRAWINGS THE DISTRICT WILL REIMBURSE THE CONTRACTOR FOR THE ADDITIONAL PAVING OR BASE MATERIAL AT THE FOLLOWING RATES PER SQUARE FOOT PER INCH OF THICKNESS:

PREMIX OR A.C. - 6¢
CONCRETE - 10¢
BASE MATERIAL - 2¢

QUANTITY FOR PAYMENT FOR ADDITIONAL PAVING OR BASE MATERIAL SHALL BE BASED ON THE ACTUAL WIDTH OF MATERIAL REPLACED, BUT NOT TO EXCEED A WIDTH OF O.D. OF THE PIPE + 24". IF THE CONTRACTOR IS REQUIRED TO REPLACE PAVING OR BASE MATERIAL OF LESS THICKNESS THAN IS INDICATED ON THE DRAWINGS, FINAL PAYMENT TO THE CONTRACTOR WILL BE REDUCED BY AN AMOUNT REPRESENTING THE REDUCTION IN PAVING OR BASE MATERIAL BASED ON 90% OF THE RATES INDICATED ABOVE AND ON THE WIDTH INDICATED ABOVE.

20 - IF AN INCORPORATED CITY, HAVING STREETS WHICH ARE NOT MAINTAINED BY THE COUNTY ROAD DEPARTMENT, DESIRES THAT TEMPORARY RESURFACING BE OMITTED TO EXPEDITE FINAL REPAVING, THE ENGINEER MAY AUTHORIZE DELETION OF THE TEMPORARY RESURFACING OVER CUTS IN PAVEMENT. IF TEMPORARY RESURFACING IS OMITTED, THE FINAL PAYMENT TO THE CONTRACTOR WILL BE REDUCED BY AN AMOUNT REPRESENTING THE REDUCTION IN TEMPORARY RESURFACING COST BASED ON THE ACTUAL AREA OF TEMPORARY RESURFACING OMITTED AT THE UNIT PRICE OF 10¢ PER SQUARE FOOT OF RESURFACING.



No.	SHEET	REVISION	INITIAL		DATE
8	7	ADDED MANHOLE	[illegible]	[illegible]	4-12-05
7	4A	INCORPORATED INSPECTOR'S AS-BUILT	[illegible]	[illegible]	4-12-05
6	4,5,4A	ADDED SHT. 4A FOR F.M. RELOCATION	[illegible]	[illegible]	4-12-05
5	6A	ADDED SHT. 6A. PROTECTION FOR SEWER SIPHON.	[illegible]	Dm7.	3-11-86
4	13	REVISED REPAVING SCHEDULE	Dm7	[illegible]	9-29-70
3	1 & 13	REVISED TRAFFIC REQUIREMENTS AND DELETED GENERAL NOTE Nº 1	Dm7.	E.P.A.	7-30-70
2	2-12,14	REVISIONS TO ALIGNMENT, ADDITIONAL SUBSTRUCTURES AND ADJUSTMENT OF B.M.	Dm7	[illegible]	7-21-70
1	2 & 14	EXTENDED JACKING LIMITS PER S.P.R.R. REQ.	Dm7.	[illegible]	6-10-70

FINAL SURVEY F.B.

32-p-6

SHEET No. 1 OF 15 SHEETS

DISCLAIMER: THE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY (DISTRICTS) PROVIDE THIS INFORMATION "AS IS" FOR GENERAL REFERENCE ONLY. THE DISTRICTS DO NOT GUARANTEE OR WARRANT THE ACCURACY OF ANY INFORMATION SHOWN OR THE DRAWINGS AVAILABLE FOR DOWNLOAD. THE DISTRICTS DISCLAIM ANY EXPRESS OR IMPLIED WARRANTY. THIS INFORMATION SHOULD NOT BE RELIED UPON FOR CONSTRUCTION. THE INFORMATION MAY REFLECT ONLY AS-PLANNED LOCATIONS AND DOES NOT NECESSARILY ACCURATELY REFLECT THE LOCATIONS OF AS-BUILT FACILITIES OR SUBSEQUENTLY BUILT FACILITIES. APPROPRIATE FIELD VERIFICATION IS REQUIRED IN ORDER TO DETERMINE THE EXACT LOCATION OF DISTRICTS' FACILITIES. FACILITIES WITHIN DISTRICTS' PROPERTY ARE NOT SHOWN. ANY PERSON PERFORMING EXCAVATION MUST COMPLY WITH CALIFORNIA GOVERNMENT CODE SECTION 4216. NOTE THAT "SUBSURFACE INSTALLATIONS" AS DEFINED BY CALIFORNIA GOVERNMENT CODE SECTION 4216 EXCLUDES NON-PRESSURIZED SEWERS, NON-PRESSURIZED STORM DRAINS, AND OTHER NON-PRESSURIZED DRAIN LINES. ANY PERSON PLANNING TO CONSTRUCT IMPROVEMENTS OVER OR BELOW DISTRICTS' FACILITIES WITHIN PRIVATE RIGHT-OF-WAY SHALL OBTAIN A BUILDOVER AGREEMENT PRIOR TO CONSTRUCTION.

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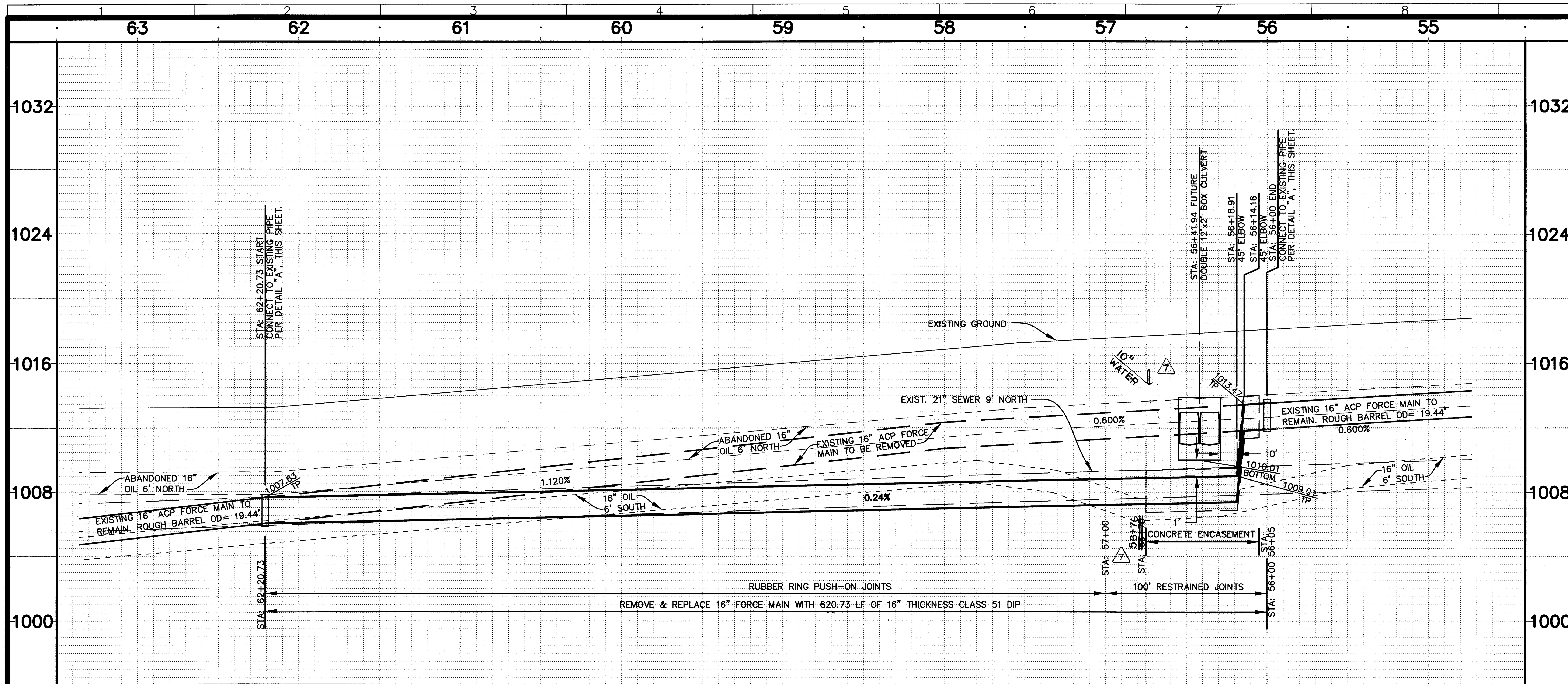
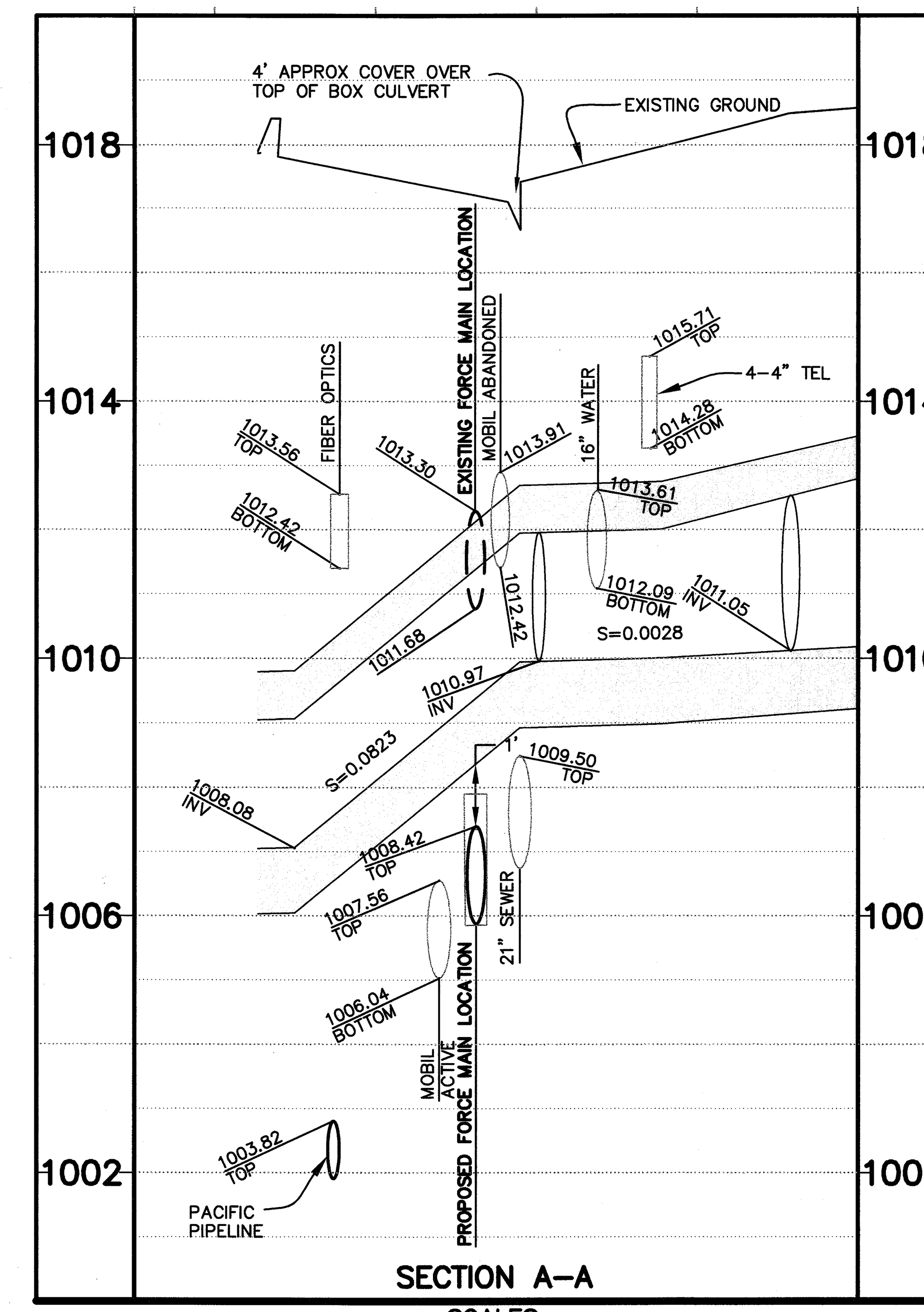
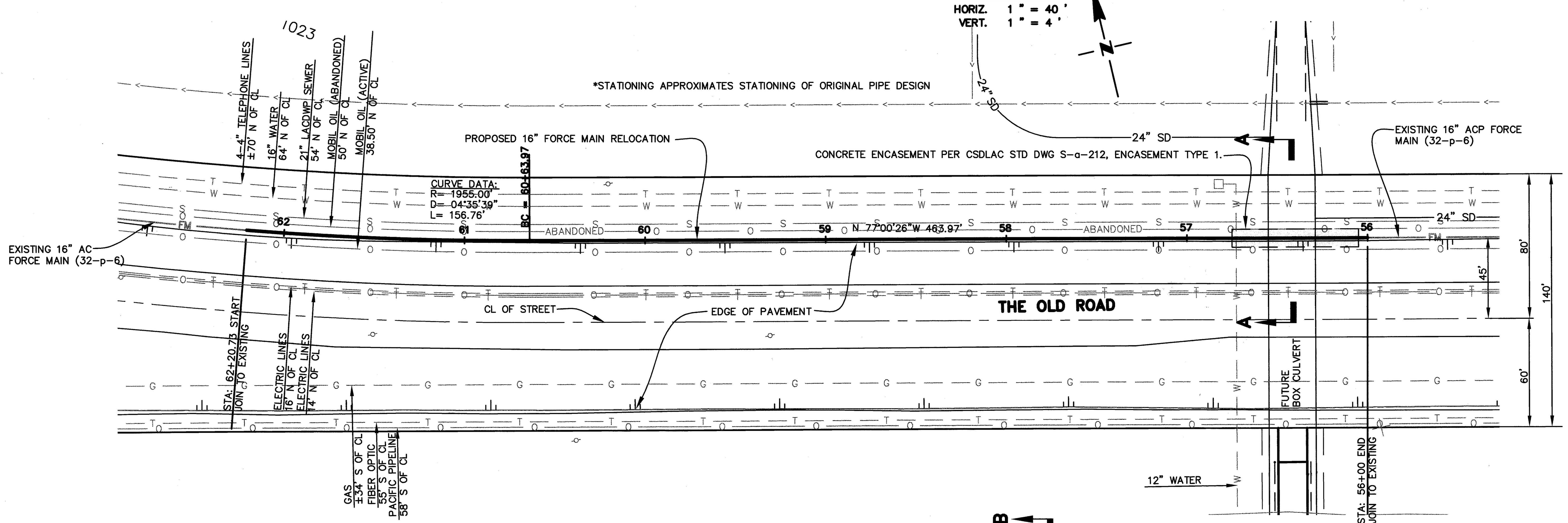




SECTION A-A

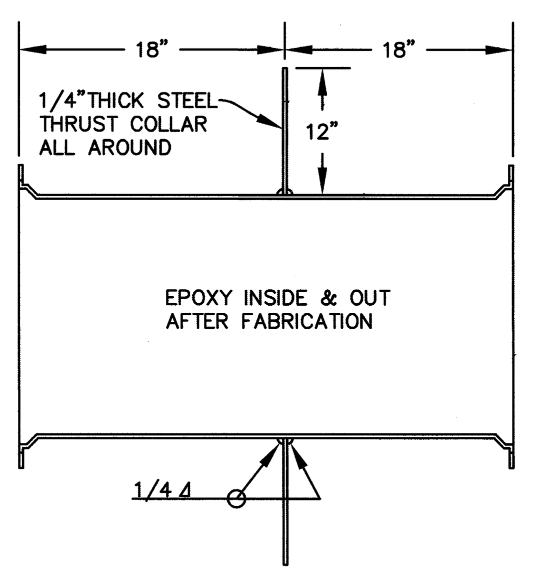
SCALES
HORIZ. 1" = 20'
VERT. 1" = 2'

SCALES
HORIZ. 1" = 40'
VERT. 1" = 4'

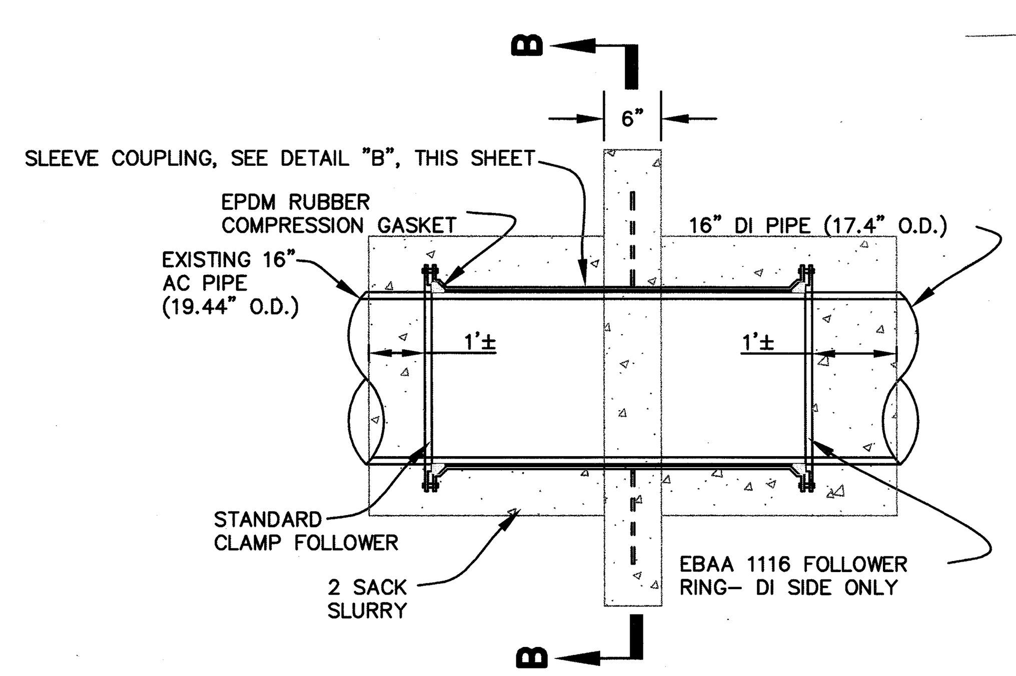


CONSTRUCTION NOTES

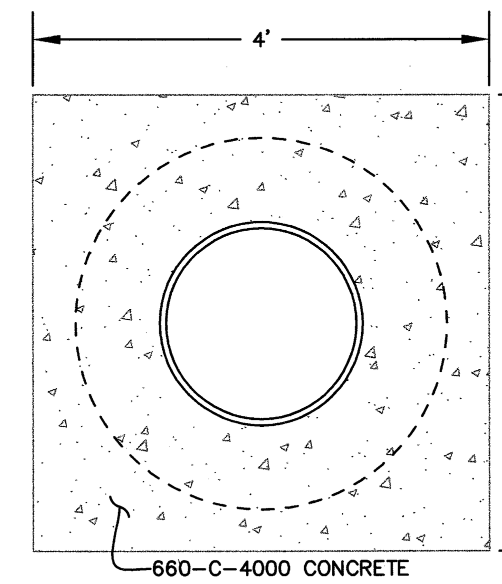
1. ALL SEWER CONSTRUCTION WORK ON THIS PROJECT SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2003 EDITION, AND THE AMENDMENTS TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2003 EDITION AND STANDARD DRAWINGS FOR CONSTRUCTION, AS ADOPTED BY COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY DATED DECEMBER 2003.
2. THE CONTRACTOR SHALL NOTIFY MR. PAUL PERKINS OF THE COUNTY SANITATION DISTRICTS AT (323) 283-0881 AT LEAST 48 HOURS PRIOR TO THE START OF THE CONSTRUCTION. ALL SEWER WORK ON THIS PROJECT SHALL BE DONE IN THE PRESENCE OF A COUNTY SANITATION DISTRICTS REPRESENTATIVE.
3. ALL SEWER PIPE MATERIALS SHALL BE INSPECTED AND APPROVED BY THE COUNTY SANITATION DISTRICTS REPRESENTATIVE(S) AT THE PIPE MANUFACTURER'S PLANT PRIOR TO DELIVERY TO THE JOB SITE.
4. THE SEWER SHALL NOT BELONG TO THE COUNTY SANITATION DISTRICTS UNTIL ACCEPTANCE BY THE DISTRICTS BOARD OF DIRECTORS.
5. THE DISTRICTS CONSTRUCTION INSPECTION SHALL ONLY PERTAIN TO SUBBEDDING, BEDDING, PIPE LAYING, PIPE TESTING, AND CONNECTING. IN THESE MATTERS THE DISTRICT'S CONSTRUCTION INSPECTOR SHALL HAVE JURISDICTION. ALL OTHER ACTIVITIES SUCH AS TRENCHING, CONSOLIDATION OF BACKFILL, PAVING AND STREET WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CITY AND/OR COUNTY REQUIREMENTS.
6. SEWER PIPE USED IN THIS PROJECT SHALL BE DUCTILE IRON PIPE PER AWWA C-151 THICKNESS CLASS 51 (t=0.37") WITH DOUBLE THICKNESS CEMENT MORTAR LINING PER AWWA C104. PIPE SHALL BE ENCASED WITH 8 MIL POLYETHYLENE WRAP PER AWWA STANDARD C105.
7. PUSH-ON JOINTS SHALL CONFORM TO AWWA C111 APPENDIX B. RESTRAINED JOINTS SHALL HAVE A RUBBER GASKET WITH STAINLESS STEEL LOCKING SEGMENTS VULCANIZED INTO THE GASKET, FIELDLOK 350 AS MANUFACTURED BY US PIPE, OR EQUAL.
8. ALL BOLTS BELOW GRADE SHALL BE HIGH STRENGTH, LOW ALLOY PER ASTM A193 GRADE B8M (316SS) PATTERN, DIMENSION AND THREAD SHALL BE PER ASME B18.2.1, STANDARD HEX HEAD. BOLTS SHALL BE COARSE THREAD AND CLASS 2B FIT. NUTS SHALL BE PER ASTM A194 GRADE 8M (316SS). PATTERN, DIMENSION AND THREAD SHALL BE PER ASME B16.2.2 STANDARD HEX HEAD PATTERN AND ASME B1.1 COARSE THREAD, CLASS 2B FIT.
9. TRENCHING SHALL BE DONE IN PER LOS ANGELES COUNTY STANDARD PLAN 2027-1.
10. FITTINGS SHALL BE CLASS 250 RESTRAINED JOINT FITTINGS PER NOTE 7 ABOVE.
11. EXTERNAL COATINGS ON ALL PIPE AND FITTINGS SHALL BE A 1 MIL (MIN) THICK SHOP APPLIED ASPHALT COATING PER AWWA C151 AND C110.
12. COAT ALL BURIED NUTS AND BOLTS WITH NON-OXIDE CORROSION RESISTANT GREASE AND WRAP IN 8-MIL POLYETHYLENE BAG PRIOR TO BACKFILL OR PLACING CONCRETE ENCASEMENT, THRUST OR RESTRAINT BLOCKS. OVERLAP BAG 2 FEET ONTO ADJOINING PIPE ON EACH SIDE OF FITTING OR JOINT. TAPE TO PIPE WITH 2 WRAPS (MIN) 10 MIL POLYKEN TAPE.
13. JOINING COLLAR: AS SHOWN ON DETAIL. DO NOT COAT OR WRAP THRUST RESTRAINT RING
14. AC PIPE SHALL BE SEVERED AT THE FIRST COLLARED JOINT BEYOND THE POINT OF CONNECTION SHOWN. NOTE ON THE PLANS THE ACTUAL CONNECTION POINT. CAREFULLY BREAK COLLAR WITHOUT DAMAGE TO THE HOST PIPE TO REMAIN IN SERVICE. REMOVE RUBBER RING FROM MILLED PIPE END TO REMAIN IN SERVICE.
15. PRESSURE TEST IN ACCORDANCE WITH SPPWC 306-1.4. TEST PRESSURE SHALL BE 65 psig.



B/1 SLEEVE COUPLING DETAIL
NTS



A/1 PIPE CONNECTION DETAIL
NTS



SECTION B-B

NO.	REVISIONS	INITIALS	DATE
6	ADDED SHT 4A FOR F.M. RELOCATION		4-12-05
7	INCORPORATED INSPECTOR'S AS-BUILT		4-12-05

DESIGNED PENFIELD & SMITH ENGINEERS 5/5/04
DRAWN PENFIELD & SMITH ENGINEERS 5/5/04
CHECKED PENFIELD & SMITH ENGINEERS 5/5/04
REVIEWED PENFIELD & SMITH ENGINEERS 5/5/04

REFERENCE DWG. NO.
FIELD BOOK NO.

COUNTY SANITATION DISTRICT NO. 32
OF LOS ANGELES COUNTY, CALIFORNIA

CASTAIC PUMPING PLANT FORCE MAIN

PLAN AND PROFILE

APPROVED: COUNTY SANITATION DISTRICT NO.32
OF LOS ANGELES COUNTY, CA.
JAMES F. STAHL - CHIEF ENGINEER & GENERAL MANAGER
BY: [signature] for DATE: 7-1-04
OFFICE ENGINEER

FINAL SURVEY	FIELD BOOK	PLOTTED	CHECKED	DATE

REGISTERED PROFESSIONAL ENGINEER DANIEL S. [illegible] NO 43846 EXPIRES 6/30/05 CIVIL STATE OF CALIFORNIA

SHEET NO. 4A
OF 15 SHEETS
DWG. NO. 32-p-6

5/5/04

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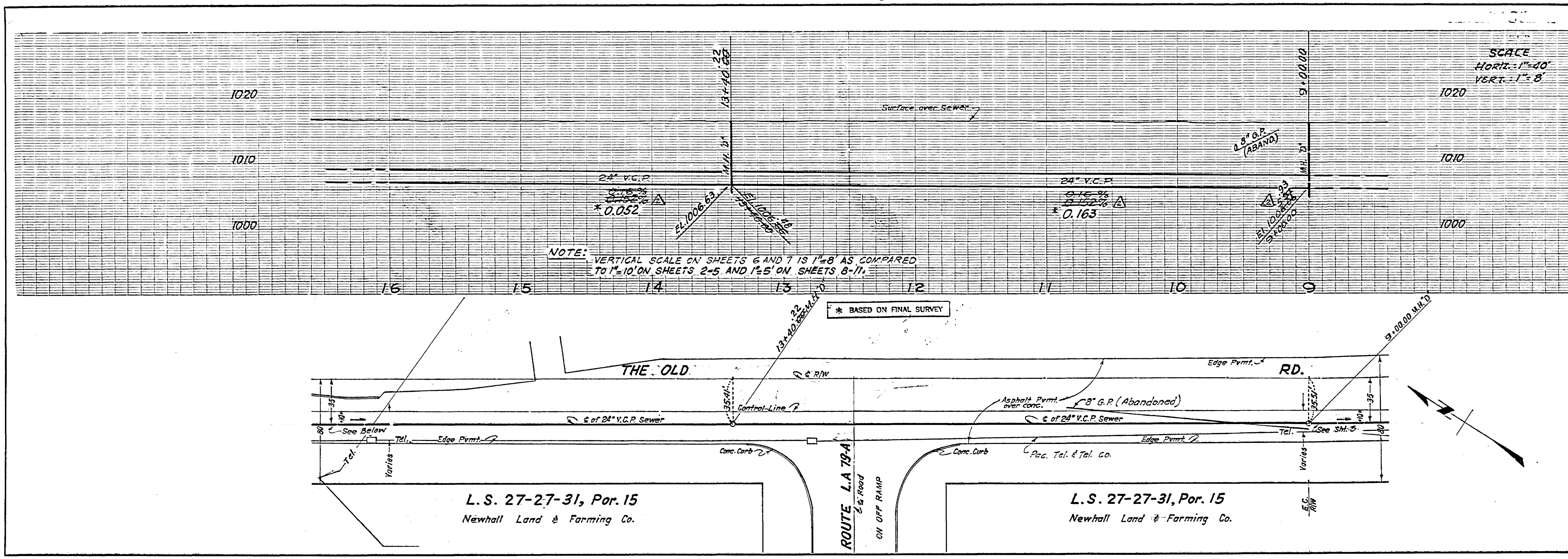

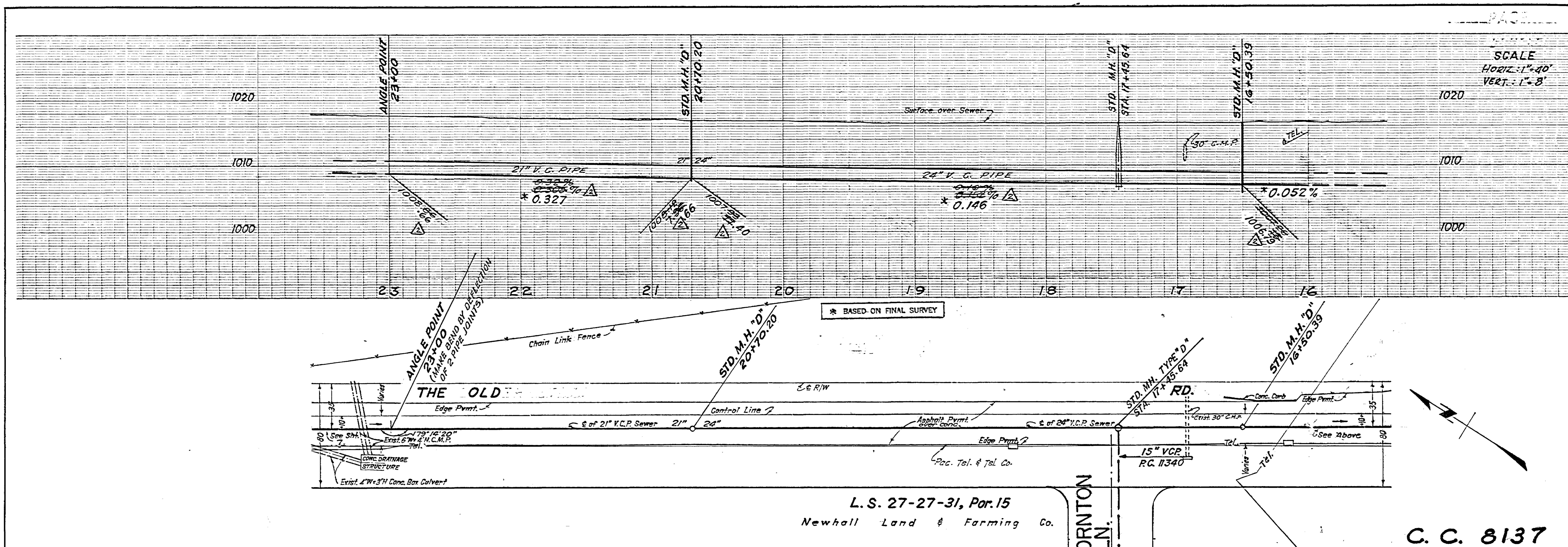

REVISION
△ REVISED PROFILE 7-21-70

COUNTY SANITATION DISTRICT No 32 OF LOS ANGELES COUNTY, CALIF.

PREPARED BY DEPARTMENT OF COUNTY ENGINEER, JOHN A. LAMBIE COUNTY ENGINEER

APPROVED — SANITATION ENGINEER

CASTAIC TRUNK SEWER - SEC. 2
PLAN & PROFILE

SHEET No 6 OF 15 SHEETS

DWG. NO. 32-p-6

C. C. 8137

FINAL SURVEY, F.B. 1192, H.F.W. 9-28-71, T.A.H.

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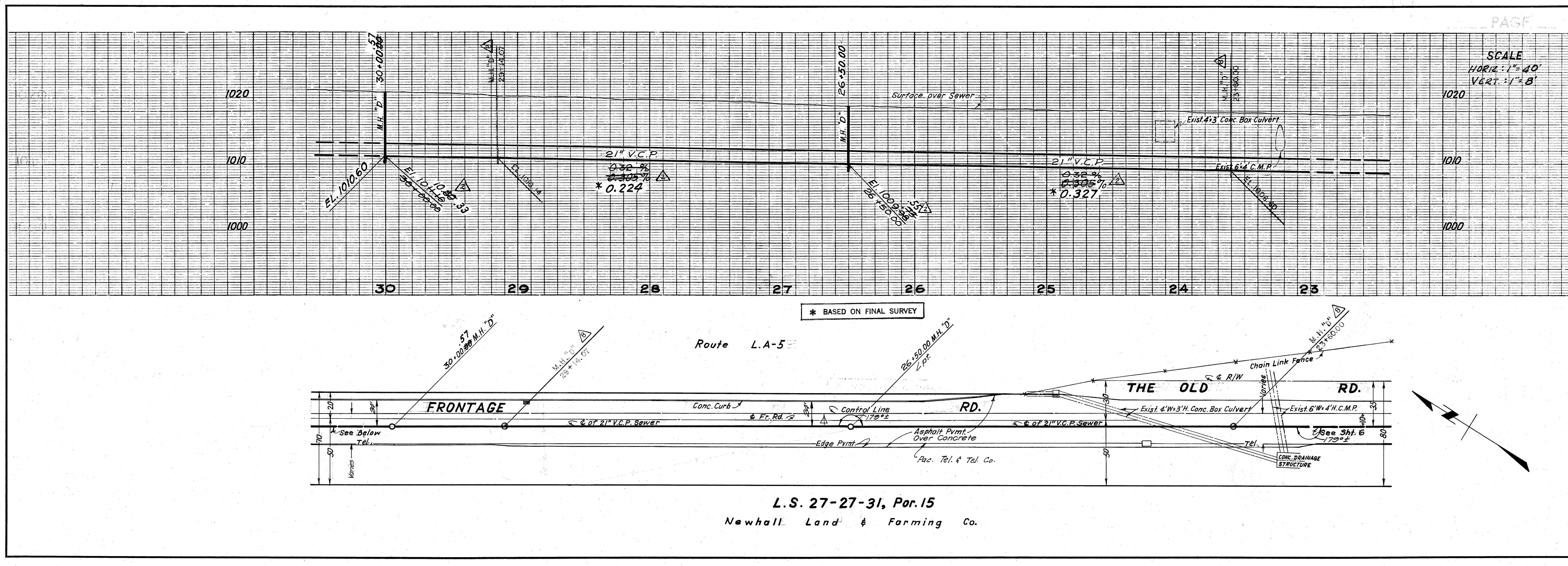

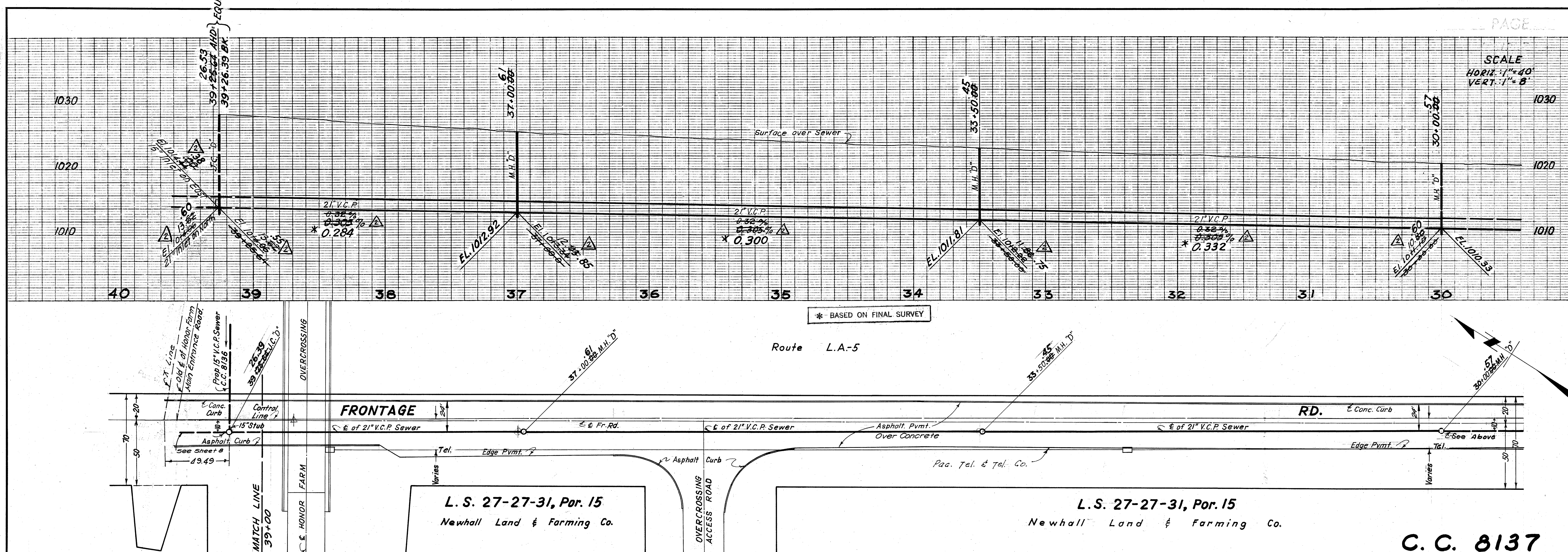

REVISION		
REVISED PROFILE	7-21-70	
ADDED MANHOLE	4-17-05	

COUNTY SANITATION DISTRICT No 32 OF LOS ANGELES COUNTY, CALIF.

PREPARED BY DEPARTMENT OF COUNTY ENGINEER, JOHN A. LAMBIE, COUNTY ENGINEER

CASTAIC TRUNK SEWER - SEC. 2

PLAN & PROFILE

SHEET No 7 OF 15 SHEETS

DWG. No 32-p-6

C. C. 8137

FINAL SURVEY, F.B. 1192, H.F.W. 9-28-71 T.A.H.

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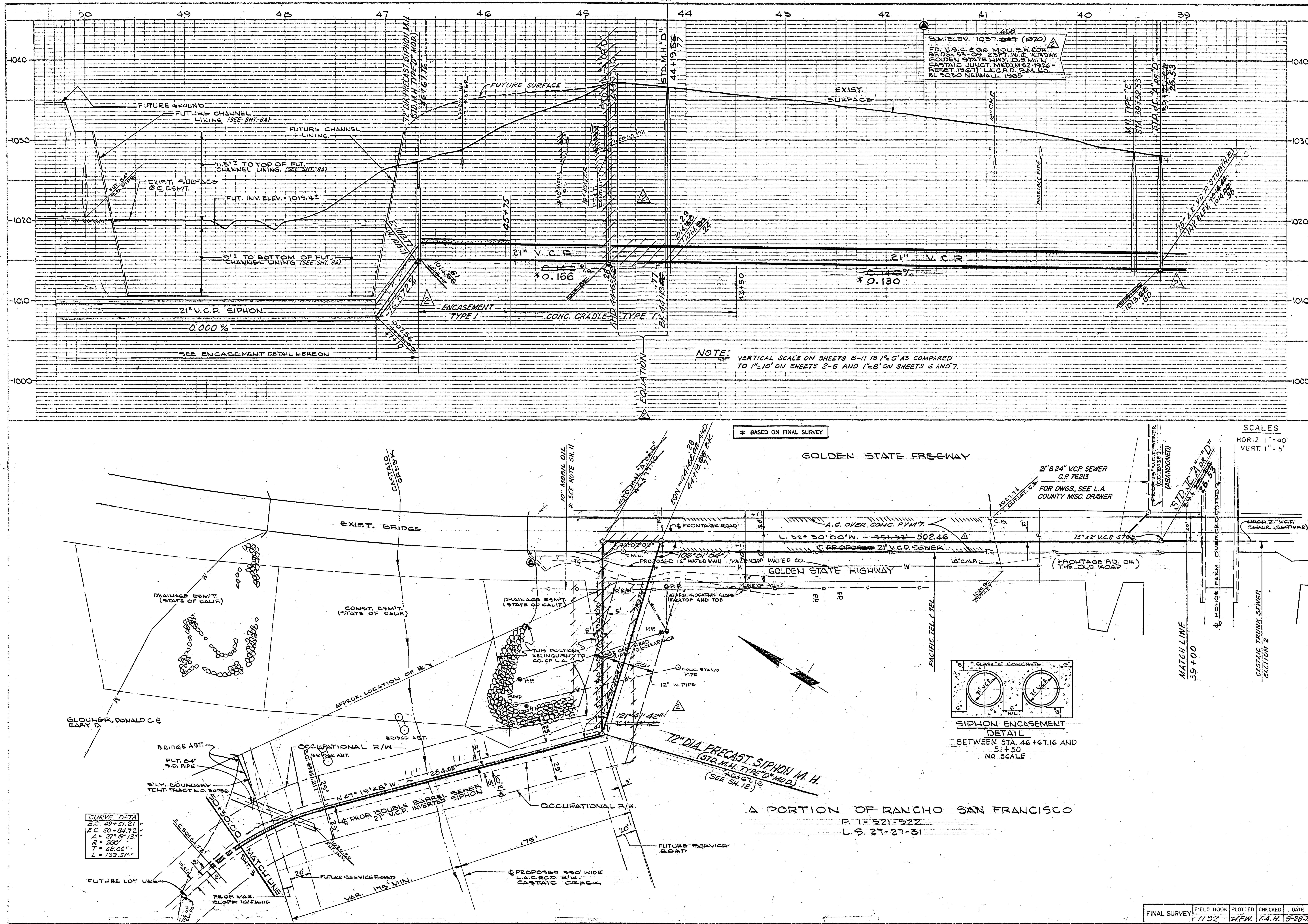

COUNTY SANITATION DISTRICT NO. 32 OF LOS ANGELES COUNTY, CALIF.

SUBMITTED MAY 12, 1970
RECOMMENDED MAY 12, 1970
APPROVED MAY 12, 1970

REVISED ALIGNMENT VIC. STA. 45+00 & ADJ. B.M. — 8 — 7-21-70

PREPARED BY SIKAND ENGINEERING ASSOCIATES

DESIGNED
DATE May 12, 1970

CASTAIC TRUNK SEWER SECTION 3

SHEET NO. 8 OF 15 SHEETS

FINAL SURVEY	FIELD BOOK	PLOTTED	CHECKED	DATE
	1192	H.F.W.	T.A.H.	9-28-71

DWG. NO. 32-P-6

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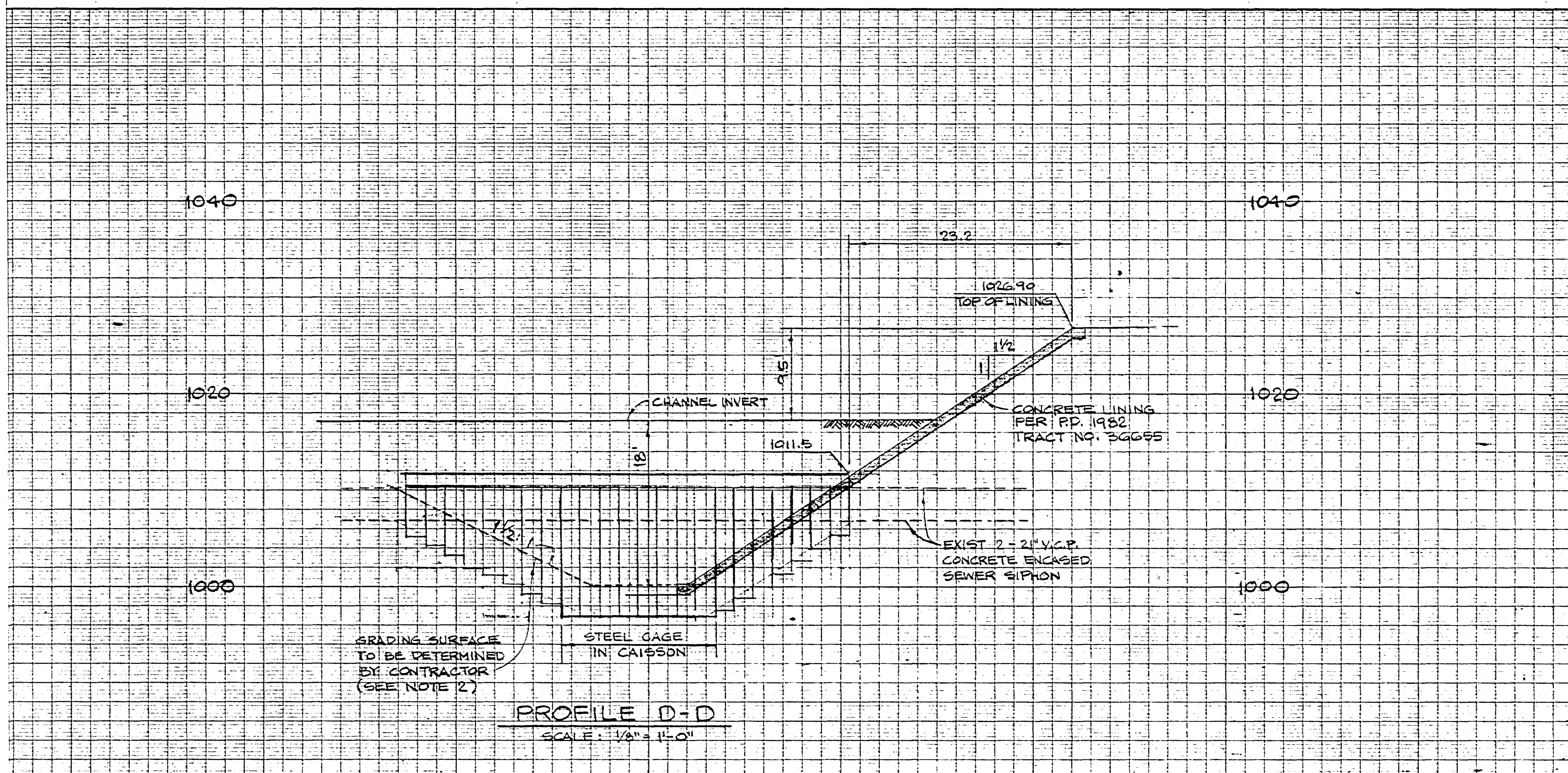
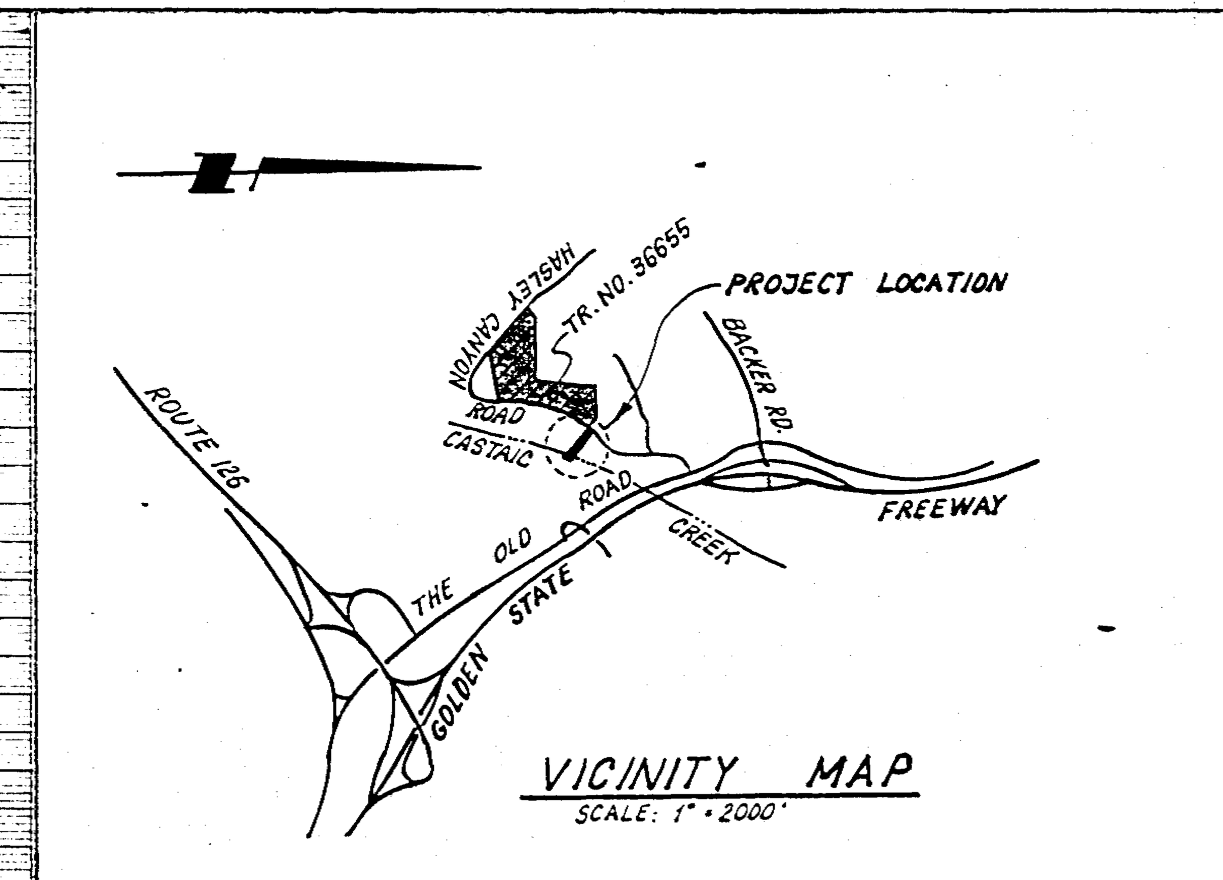


PROFILE D-D
SCALE: 1/8" = 1'-0"

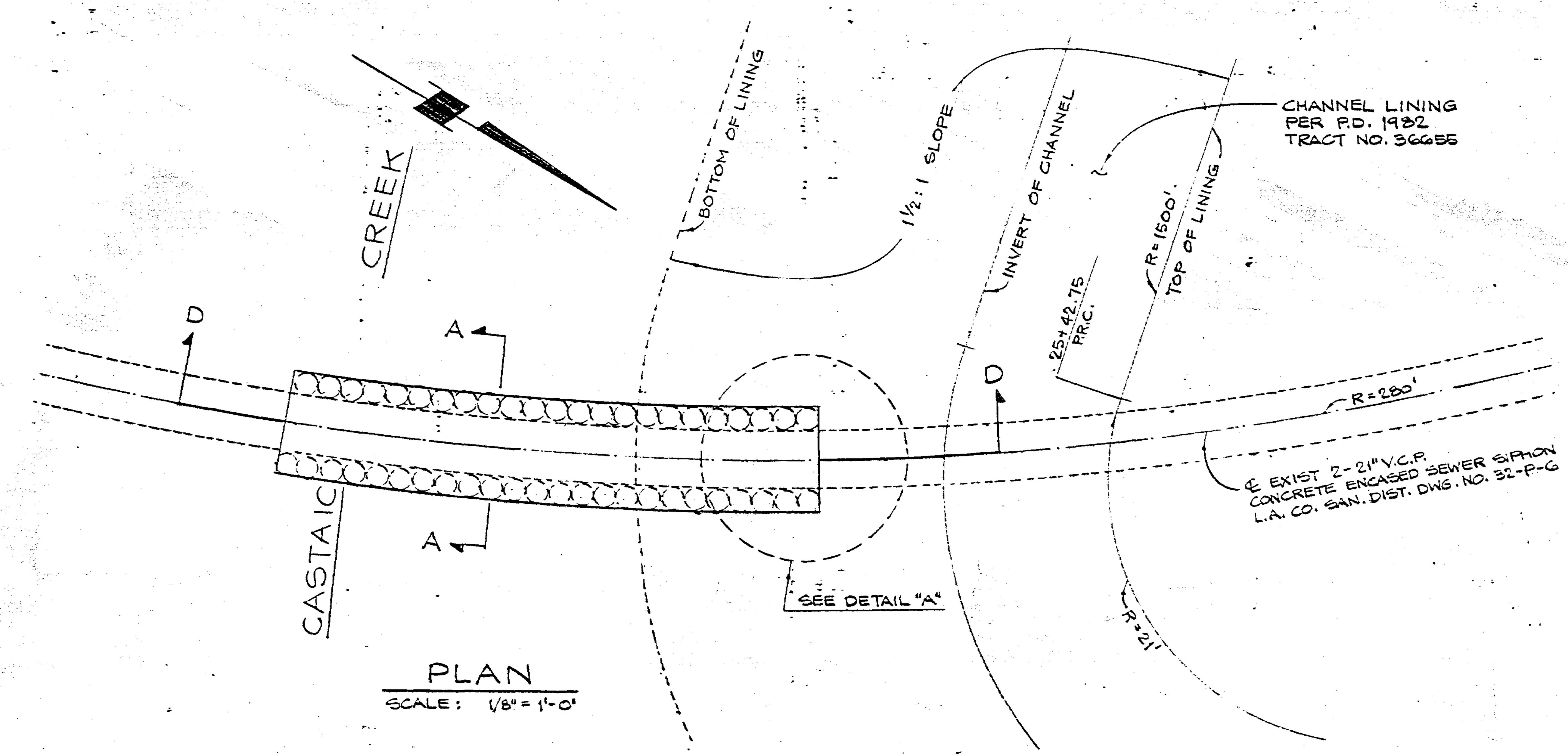


VICINITY MAP
SCALE: 1" = 2000'

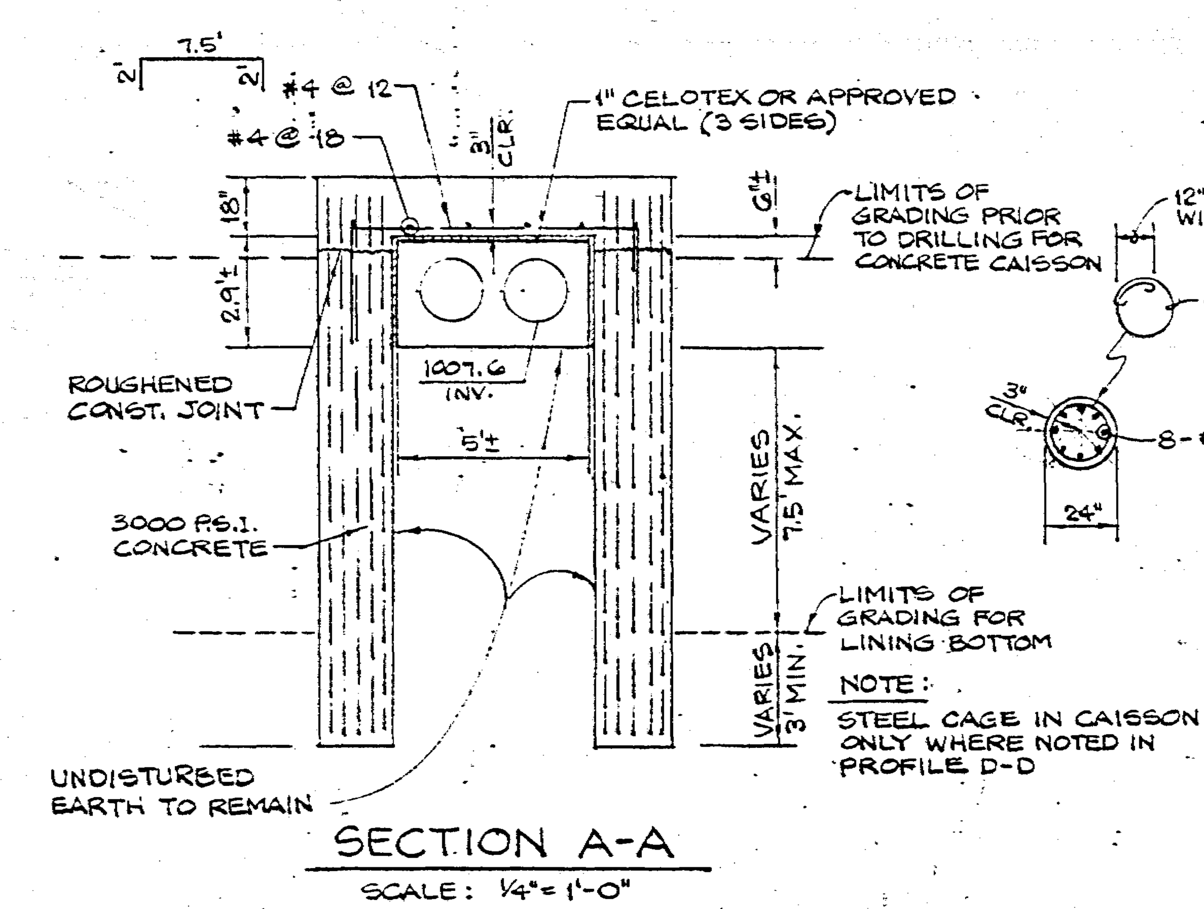
NOTES:

1. CONCRETE SHALL OBTAIN A ULTIMATE UNIT COMPRESSIVE STRESS OF 3000 P.S.I. IN 28 DAY TEST.
2. HORIZONTAL LIMITS OF GRADING TO BE DETERMINED BY CONTRACTOR PRIOR TO DRILLING HOLES FOR CAISSONS. HORIZONTAL LIMITS OF CAISSON TO BE ADJUSTED IF HORIZONTAL LIMITS OF GRADING CHANGES.
3. CAISSONS AND TOP CONCRETE BEAM MUST BE COMPLETED AND SET AT LEAST 7 DAYS PRIOR TO GRADING ON EACH SIDE OF SEWER SIPHON. DIFFERENTIAL LEVEL OF GRADING ON EACH SIDE OF SIPHON SHALL NOT EXCEED 2 FEET. PLACEMENT OF COMPACTED BACKFILL LEVEL ON EACH SIDE OF SIPHON SHALL ALSO NOT EXCEED 2 FEET.
4. WORK SHALL BE INSPECTED BY L.A. CO. SANITATION DISTRICT.

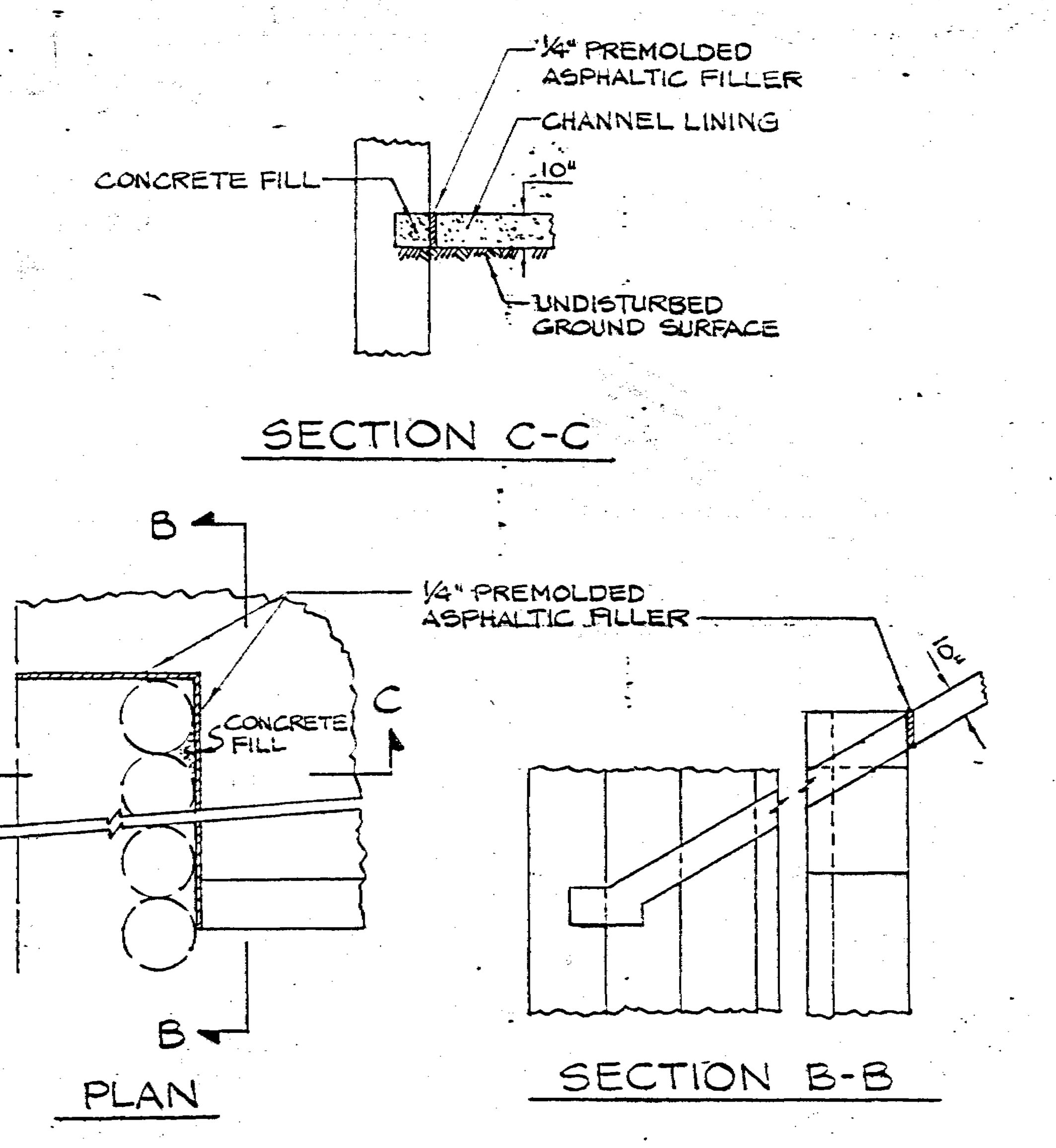
NOTE:
THIS PROJECT IS INCOMPLETE UNTIL FINALIZED BY C.S.D. FIELD FORCES. 3-11-86



PLAN
SCALE: 1/8" = 1'-0"



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



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

LOS ANGELES COUNTY SANITATION DISTRICT NO. 32
CHARLES W. CARRY, CHIEF ENGINEER
APPROVED BY: [signature] 2/27/86 ~~for OFFICE ENGINEER~~

SUGGESTED PROTECTION FOR EXISTING SEWER SIPHON

REV. NO	DATE	REVISION				BY	APP.
SCALE: AS SHOWN	CHK'D. BY:	APPROVED BY: John R. Peiia	R.C.E. NO. 9812	DATE: 2-12-86	DWG. NO. 1020-177A	SHEET 1 OF 1	

SIKAND ENGINEERING ASSOCIATES
CONSULTING ENGINEERS
15230 BURBANK BLVD., VAN NUYS, CALIFORNIA 91411
(818) 787-8550

5

CASTAIC T.S. SECTIONS 1, 2 & 3, and
CASTAIC PUMPING PLANT FORCE MAIN

32-P-6
Sht. No 8A
of 15 Shts.

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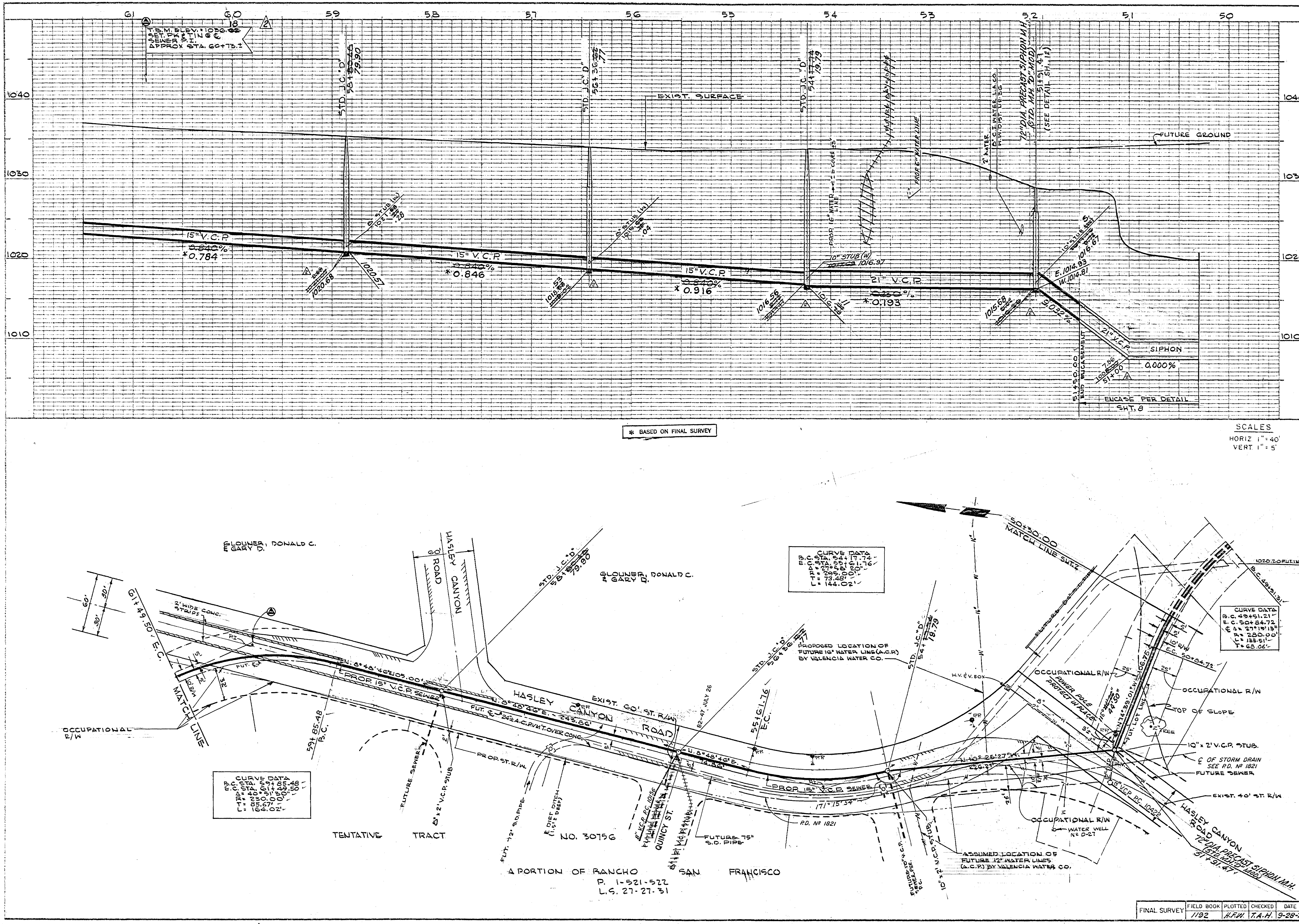

9	REVISED B.M. ELEV.		7-21-70
NO. SHEET	REVISIONS	INITIALS	DATE

COUNTY SANITATION DISTRICT NO. 32
OF LOS ANGELES COUNTY, CALIF.

SUBMITTED — MAY 12, 1970
RECOMMENDED — MAY 12, 1970
APPROVED — MAY 12, 1970

PREPARED BY SIKAND ENGINEERING ASSOCIATES

DESIGNED BY
DATE May 12, 1970

CASTAIC TRUNK SEWER SECTION 3

SHEET NO. 9
OF 15 SHEETS

FINAL SURVEY	FIELD BOOK	PLOTTED	CHECKED	DATE
	1192	H.F.W.	T.A.H.	9-28-71

DWG. NO. 32-P-6

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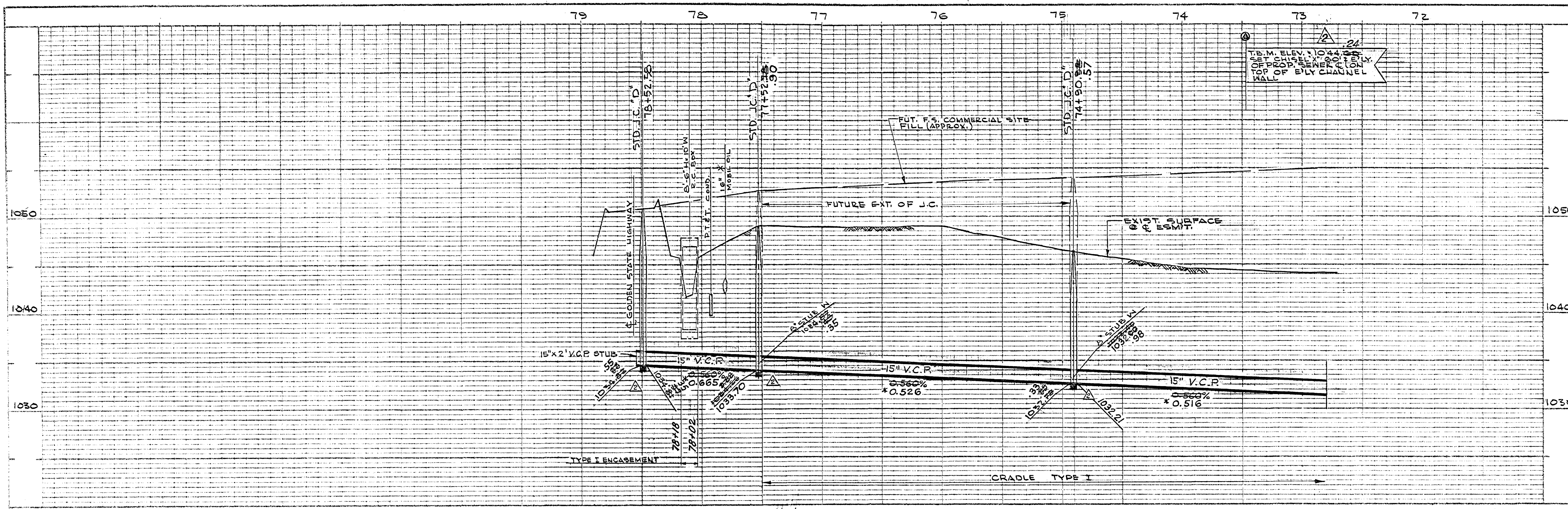


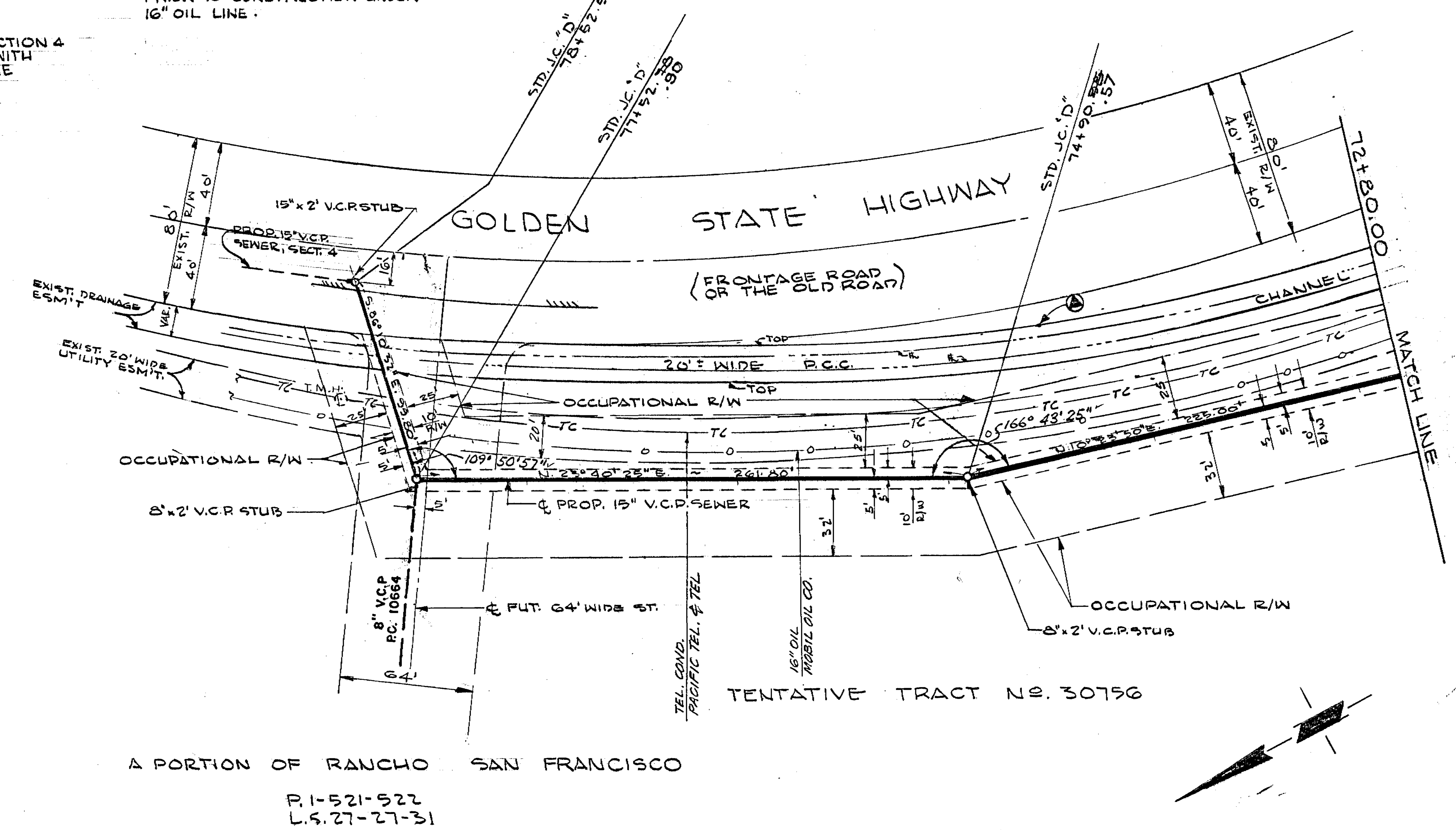
* NOTIFY MR. WILLIAM COLLINS OF MOBIL OIL AT 775-3563 48 HRS. PRIOR TO CONSTRUCTION UNDER 16" OIL LINE.

* BASED ON FINAL SURVEY

SCALES
HORIZ. 1" = 40'
VERT. 1" = 5'

END OF CONSTRUCTION NOTE

CONST. 8" BRICK BULKHEAD, OR IF SECTION 4 IS EXIST., REMOVE BULKHEAD AND JOIN WITH CONCRETE COLLAR AS DIRECTED BY THE ENGINEER



A PORTION OF RANCHO SAN FRANCISCO

P. 1-521-522
L.S. 27-27-31

COUNTY SANITATION DISTRICT NO. 32
OF LOS ANGELES COUNTY, CALIF.

SUBMITTED — MAY 12, 1970
RECOMMENDED — MAY 12, 1970
APPROVED — MAY 12, 1970

NO.	SHEET	REVISIONS	INITIALS	DATE
2	11	REVISED B.M. ELEV.		7-21-70

PREPARED BY
SIKAND ENGINEERING ASSOCIATES

DESIGNED
DATE May 12, 1970

CASTAIC TRUNK SEWER
SECTION 3

SHEET NO. 11
OF 15 SHEETS

FINAL SURVEY	FIELD BOOK	PLOTTED	CHECKED	DATE	DWG. NO.
	1192	A.F.W.	T.A.H.	9-28-71	32-P-6

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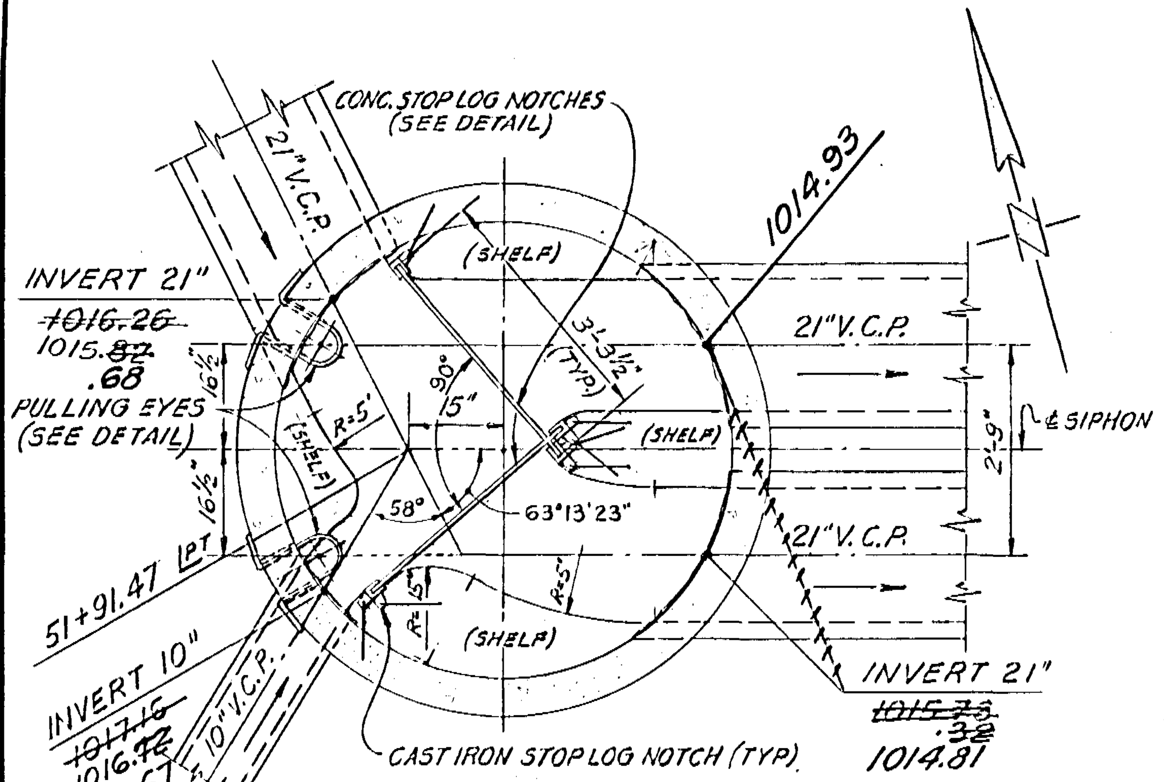
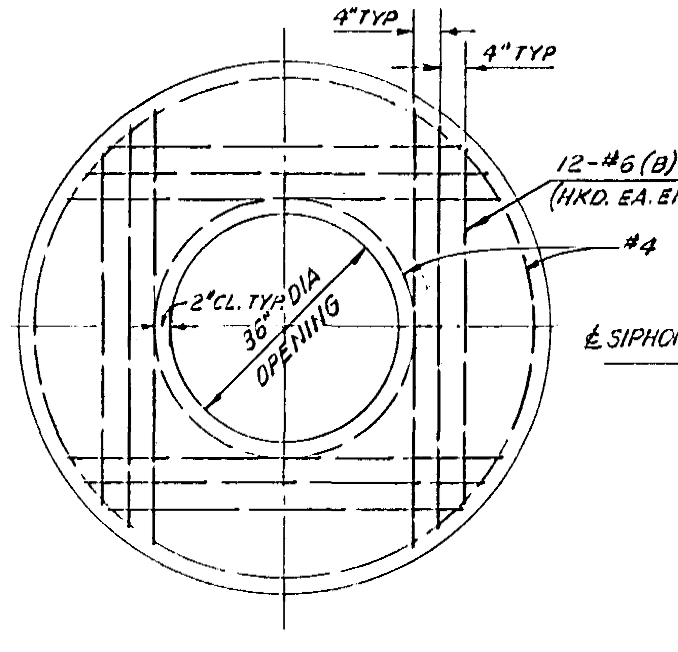


PLAN

72" DIA. PRECAST SIPHON M.H.

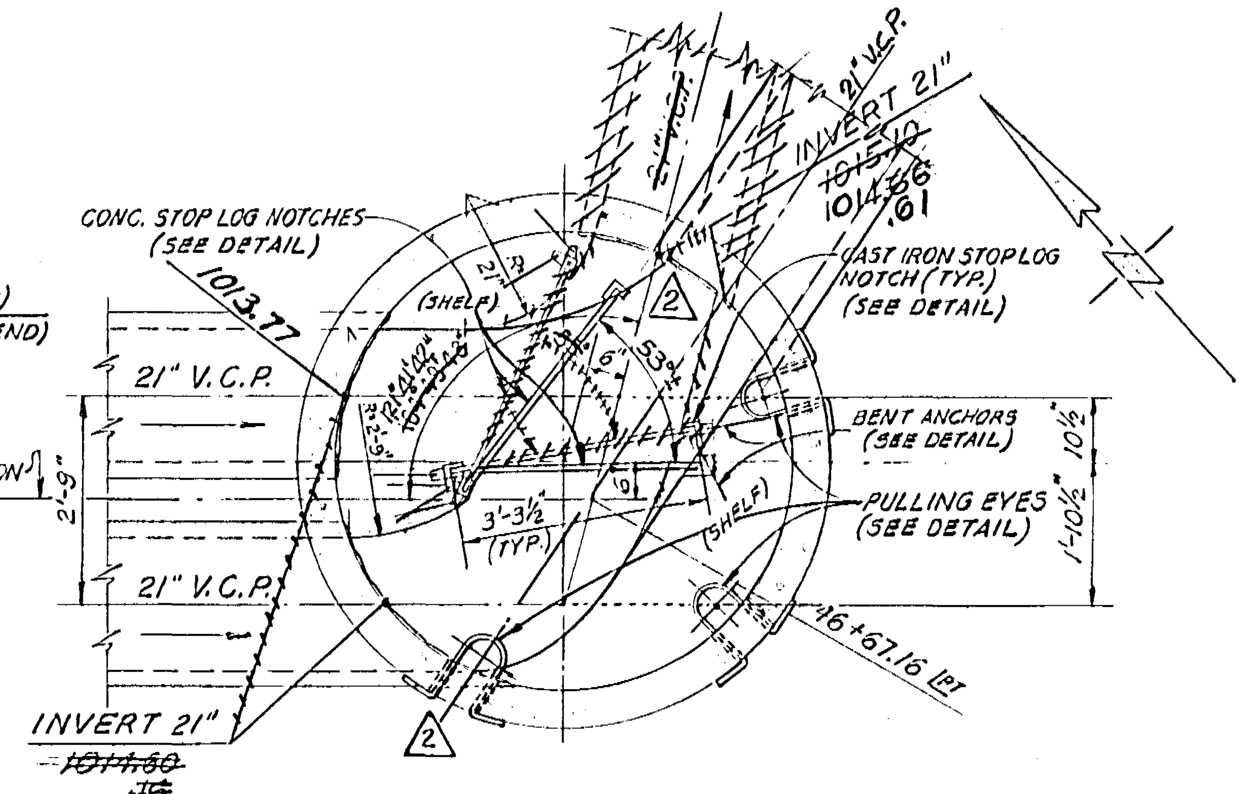
TYPE "D" (MODIFIED)

STA. 51+91.47



PLAN

FLAT SLAB TOP

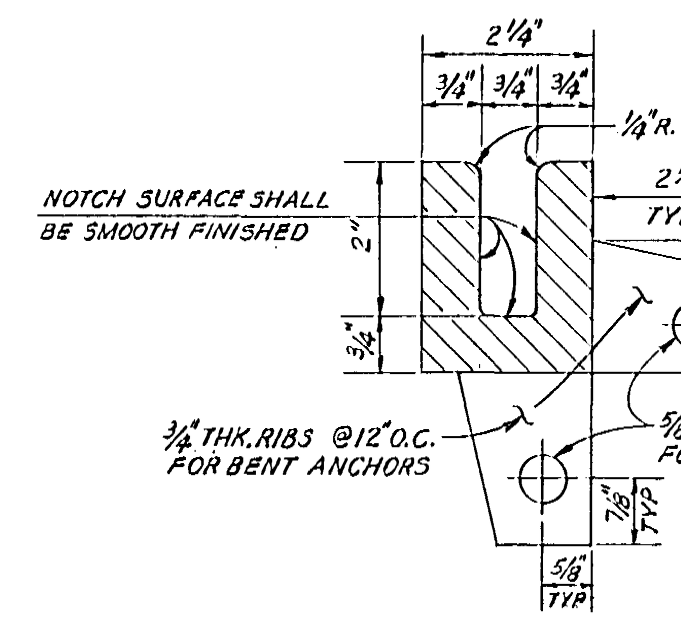


PLAN

72" DIA. PRECAST SIPHON M.H.

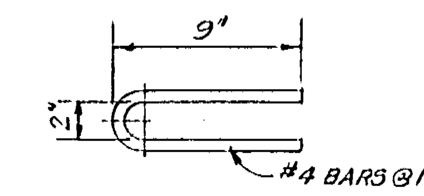
TYPE "D" (MODIFIED)

STA. 46+67.16



CAST IRON STOP LOG NOTCH

HALF SCALE

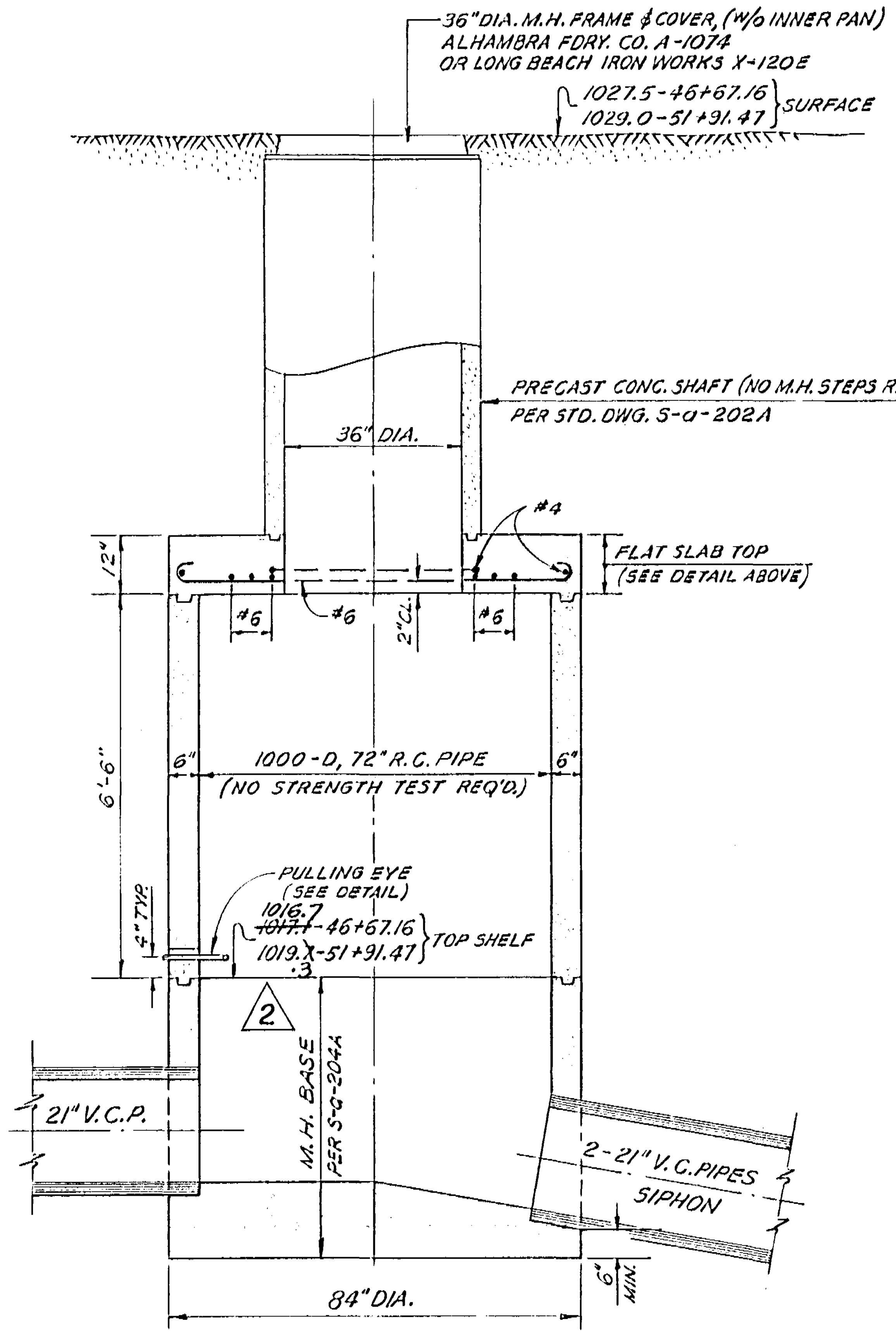


BENT ANCHOR

NO SCALE

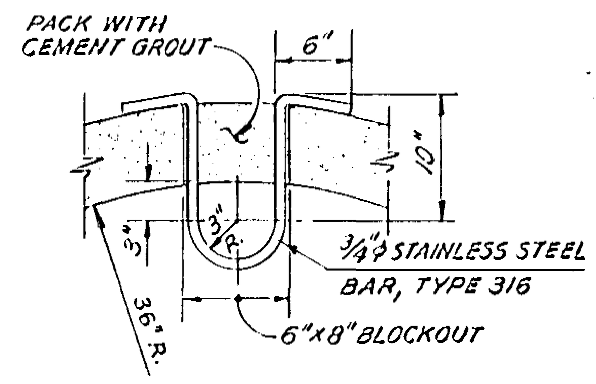
NOTES:

1. CAST IRON NOTCHES SHALL BE GRAY IRON CASTING ASTM-A48 CLASS 35B.
2. SUBMIT SHOP DRAWINGS FOR APPROVAL OF ENGINEER PRIOR TO FABRICATION.
3. BENT ANCHORS SHALL BE SUPPORTED IN A HORIZONTAL POSITION DURING POURING OF CONCRETE.



TYPICAL SECTION

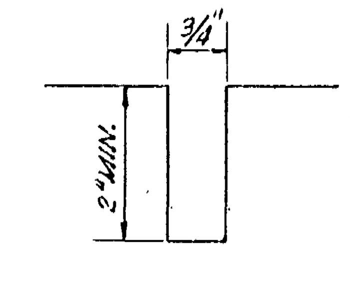
(CHANNELS & STOP LOGS NOT SHOWN)



PULLING EYE

5 REQ'D.

SCALE 1" = 1'-0"



NOTE:

NOTCH SHALL BE FORMED USING STYROFOAM. CONTRACTOR SHALL REMOVE STYROFOAM AFTER CONCRETE HAS SET.

CONCRETE STOP LOG NOTCH

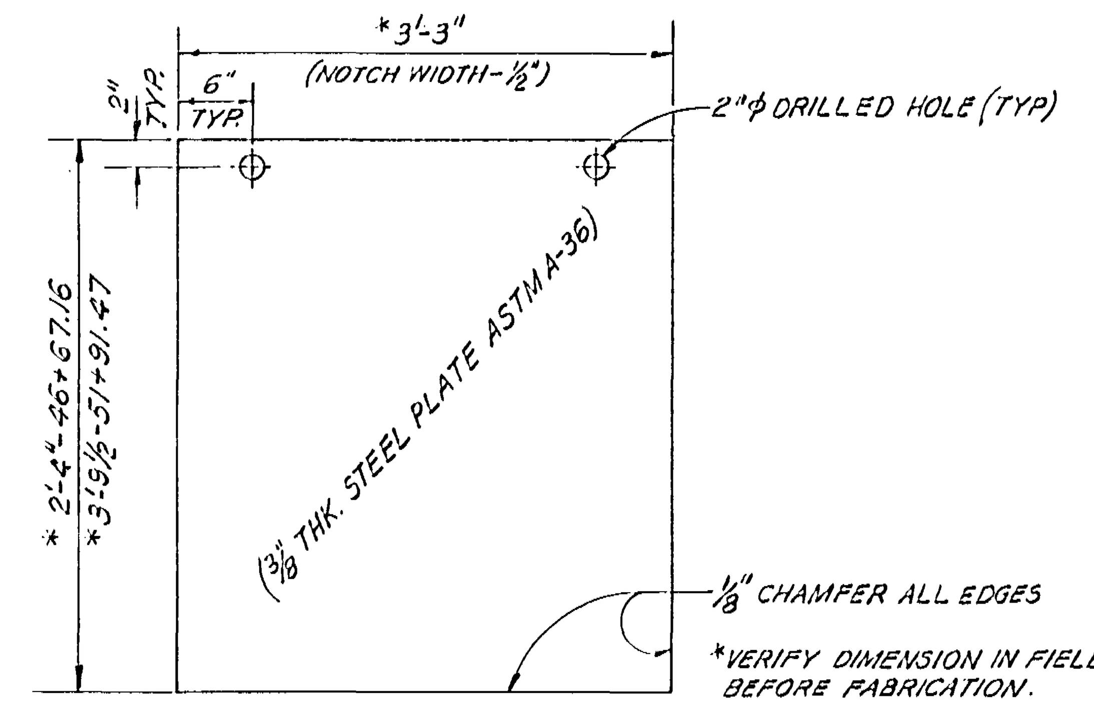
HALF SCALE

CONSTRUCTION NOTES

CONCRETE

1. ALL CONCRETE SHALL BE CLASS "A" (f'_c = 3000 PSI @ 28 DAYS)
2. ALL REINFORCING BARS SHALL BE NEW BILLET STEEL DEFORMED BARS CONFORMING TO A.S.T.M. SPECIFICATIONS A615-68, GRADE 40. REINFORCING BARS SHALL BE WELDABLE.
3. ALL HOOKS AND BENDS AND CONCRETE CONSTRUCTION SHALL CONFORM TO THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-63).
4. THE DISTRICT WILL PROVIDE CONTINUOS INSPECTION FOR ALL REINFORCED CONCRETE CONSTRUCTION.
5. THE FOLLOWING ABBREVIATIONS ARE DEFINED:

CONC.	-	CONCRETE
CL.	-	CLEAR
B.	-	BOTTOM
HKD.	-	HOOKED
TYP.	-	TYPICAL
EA.	-	EACH
M.H.	-	MANHOLE



STOP LOG

1 REQ'D. EACH M.H.

NO SCALE

PROTECTIVE COATINGS FOR STOP LOGS AND LOG NOTCHES

ALL SURFACES OF STOP LOGS AND CAST IRON STOP LOG NOTCHES SHALL BE COATED WITH "USS CHEMICALS" COAL TAR-EPOXY COATING "TARSET" PRIOR TO INSTALLATION IN THE STRUCTURE. THE COATING SHALL BE A MINIMUM THICKNESS OF 15 MILLS TOTAL DRY FILM APPLIED IN TWO OR MORE COATS. THE COAL TAR-EPOXY SHALL BE APPLIED IN CONFORMANCE WITH THE MANUFACTURER'S TECHNICAL BULLETINS AND RECOMMENDATIONS. THE METAL SURFACES TO BE COATED WITH COAL TAR-EPOXY SHALL BE CLEANED BY ABRASIVE BLASTING IN ACCORDANCE WITH THE "STEEL BLAST CLEANING" AND THE COATING SHALL BE APPLIED IMMEDIATELY AFTER CLEANING OF THE METAL SURFACE.
A COAL TAR-EPOXY COATING EQUAL TO THE COATING CALLED FOR MAY BE SUBSTITUTED WITH APPROVAL OF THE CHIEF ENGINEER.

REVISIONS

NO.	REVISIONS	INITIALS	DATE
2	REVISIONS IN ALIGNMENT & CHANNELIZATION		7-21-70

COUNTY SANITATION DISTRICT NO. 32 OF LOS ANGELES COUNTY, CALIF.

DESIGNED		SUBMITTED	MAY 12, 1970
DRAWN	MAY, 1970	RECOMMENDED	MAY 12, 1970
CHECKED	D.M. Fuller MAY, 1970	APPROVED	MAY 12, 1970
FIELD BOOK NO.			

PREPARED BY SIKAND ENGINEERING ASSOCIATES

DESIGNED BY

DATE May 12 1970

SIPHON MANHOLES

CASTAIC TRUNK SEWER SECTION 3

SCALE: ½" = 1'-0" (EXCEPT AS NOTED)

SHEET NO. 12 OF 15 SHEETS

DWG. NO. 32-P-6

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Section 1 - General

The notes and specifications contained on these drawings are supplemental to the "Standard Specifications for the Construction of Sewers and Appurtenances" dated April 9, 1952, complete with addendum to said Standard Specifications dated October 28, 1964. In all matters where conflict exists between the notes and specifications on the drawings and the Standard Specifications, the notes and specifications on the drawings shall govern.

Unless otherwise allowed by the Engineer, the Contractor shall complete construction at each location to and including the base course of the final resurfacing within 45 calendar days after commencement of construction at the location. Completion of construction shall include all work required on the drawings and in the specifications, including manholes, house connections, planting, and replacement or repair of damaged surface improvements. Failure on the part of the Contractor to complete construction at each location, including base course of the final resurfacing, within 45 calendar days after commencement of construction at the location may result in a directive from the Engineer to cease progress on any or all parts of the work under contract until construction is completed, including base course of the final resurfacing on all portions of the project commenced more than 45 calendar days prior to the date of the directive. No additional compensation will be allowed as a result of such directive.

Throughout the period of construction, the Contractor shall keep the site free and clean from all rubbish and debris and shall promptly remove rubbish and debris from all or any portion of the site when notified to do so by the Engineer. When so directed by the Engineer, the Contractor shall furnish and operate a "pick-up-broom" with spray nozzles for cleaning up the site. Care shall be taken to prevent spillage on streets over which hauling is done, and any such spillage or debris deposited on streets due to the Contractor's operations shall immediately be cleaned up. During all phases of the construction work, the Contractor shall take precautions to abate dust nuisance by cleaning up, sweeping, sprinkling with water, or other means as necessary to accomplish results satisfactory to the Engineer, but whatever means are used, dust shall not be discharged into the atmosphere. The use of water which produces mud on public streets will not be permitted as a substitute for sweeping or other methods of control. The Contractor shall promptly remove from any parts of the working area all unused materials, surplus earth and debris, to the end that construction areas are returned to a clean, neat and acceptable condition at the earliest time following completion of the work in any reasonable reach. Failure on the part of the Contractor to comply with the orders of the Engineer regarding cleanup may result in a directive from the Engineer to cease progress on any or all parts of the work under contract until the unsatisfactory condition is corrected. No additional compensation will be allowed as a result of such suspension.

Section 2 - Sequence of Work and Cooperation With Pumping Plant Contractor

The work to be done consists of the construction of a force main and three sections of gravity sewer.

The Contractor shall construct the portion of gravity sewer between Section 3 Sta. 68+15.98 and 72+65.98 as the first order of work to expedite embankment construction by others.

Unless otherwise allowed by the Engineer, the Contractor, after completion of above portion of gravity sewer, shall commence construction at the lower end of Section 1, 2, 3, or the force main and proceed upgrade in a continuous operation on that particular section before commencing construction on another section. Where tunneling or jacking operations are required, the Engineer will authorize out-of-sequence construction.

No sewer construction shall commence within the Southern Pacific Company property, proposed pumping plant property or within R/W between Section 3 Sta. 45+15 and 45+25 until authorization is obtained from the Engineer.

A separate contract will be awarded for the construction of the Castaic Pumping Plant shown on Sheets 6A & 6B of the drawings. The Contractor shall cooperate with the pumping plant contractor to expedite construction work of both parties.

Section 3 - Notification

The Contractor shall notify the following persons or agencies at lease 48 hours prior to commencing construction:

L. A. Co. Rd. Dept. (Palmdale Office B. Chalman)	805-947-7173
L. A. Co. Sheriff's (Newhall)	805-259-1151
L. A. Co. Fire Dept. (Castaic)	805-259-2199

The Contractor shall notify the following persons or firms at least 48 hours prior to commencing construction in the vicinity of their facilities:

Pac. Tel. & Tel. (Mr. R. W. Johnson)	805-259-3720
Valencia Water Co. (Mr. Hackney)	805-259-7550
Newhall Land & Farming (Irrig) (Mr. Ed Toney)	805-259-2160

Section 4 - Traffic Requirements In and Across Streets

The Contractor shall furnish and install all advance warning signing and any other traffic control devices, including flagmen, as may be required by the County Road Dept. Whenever, in the opinion of the Engineer, the Contractor's operations create a condition hazardous to traffic or to the public, the Contractor shall furnish at his expense such flagmen and guards as are necessary to give adequate warning to the public of any dangerous conditions to be encountered and he shall furnish, erect and maintain such barricades, lights, signs and other devices as are necessary to prevent accidents and avoid damage or injury to the public. Flagmen assigned to give warning to the public that the sewer is under construction and of any dangerous conditions to be encountered as a result thereof, shall be provided with the necessary equipment and perform their duties in accordance with the current "Instructions To Flagmen" issued by the State of California Department of Public Works, Division of Highways.

Signs, lights, flags and other warning and safety devices shall conform to the requirements set forth elsewhere in the current "Manual of Warning Signs, Lights, and Devices for Use in Performance of Work Upon Highways", issued by the State of California Department of Public Works Division of Highways.

Any shifting of traffic from one lane to another, which is necessary in order to maintain the required number of lanes, shall be directed in such a manner that traffic may move smoothly through the construction zone without any sudden changes from one lane to another; toward this end the minimum radii allowed for detouring of traffic from one lane to another shall be 250 feet.

In the event that traffic striping must be relocated in order to provide the necessary lanes, the removal of both temporary and permanent striping shall be accomplished by sandblasting by the Contractor at the expense of the Contractor under the direction of the Engineer. Striping, both temporary and permanent, will be performed by the County Road Dept. and shall be paid for by the District.

No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructinns from that portion of the roadway open for use by public traffic. Equipment left overnight shall be made inoperable.

The Contractor may post "Temporary No Parking" signs in the vicinity of the actual construction work. The signs shall be posted at least 24 hours prior to commencing work.

All structures which the Contractor may elect to use to convey traffic, both vehicular and pedestrian, over the excavation, shall be approved by the County Road Dept. prior to their installation.

Unless otherwise noted, all traffic lanes mentioned herein shall have a minimum width of 10 feet. A minimum distance of 5 feet to any excavation and 2 feet from obstructions such as curbs or poles shall be maintained in addition to the lane width specified herein. Unless otherwise permitted by the Engineer, the Contractor shall comply with the following requirements when constructing in the streets:

Golden State Hwy. or Frontage Rd. or "Old Road" between Sec. 2 Sta. 1+65 and Sec. 3 Sta. 44+90

Unless otherwise allowed by the L. A. County Road Dept., maintain two lanes, one in each direction at all times, except in the vicinity of active construction between the hours of 8:00 A.M. and 4:30 P.M. where the Contractor may reduce traffic to one flagmen controlled lane.

Golden State Hwy. or "Old Road" or "Frontage Road" between Sec. 1 Sta. 5+65 & Force Main Sta. 68+00.

Maintain all lanes southbound and one lane northbound except for street crossing where one lane each way shall be maintained. Where median strip exists, opposing directions of traffic shall be separated by this median at all times.

Route LA79-A On-Off Ramp

Maintain two lanes, one in each direction at all times.

Honor Farm Access Road

Maintain two lanes, one in each direction at all times.

Hasley Canyon Road between Sec. 3 Sta. 52+29 and 59+00

~~Maintain local access at all times.~~ Same as Golden State Hwy. or "Old Road" or "Frontage Road" between Sec. 2 Sta. 1+65 and Sec. 3 Sta. 44+90.

Section 5 - Backfill and Flooding of Gravity Sewer

The backfill of the trench above a depth of 3' below the surface shall be compacted to a relative density of 90% as determined in accordance with ASTM D 1556 (In Place Density) and ASTM D 1557 (Maximum Density).

The consolidation of the backfill of the trench below a depth of 3' below the surface may be accomplished by flooding and jetting the native material in accordance with Section 36 of the Standard Specifications. The backfill may be flooded in one lift.

The cost of initial compaction tests will be paid for by the District. Any expenses for subsequent tests required because of failure of the backfill to meet the initial tests shall be borne by the Contractor.

Section 6 - Backfill of Force Main Trench

The Contractor shall provide a continuous bed for the force main pipe extending from not less than 4" below the pipe and joints to 4" above the pipe joints. This area will be referred to as the "pipe zone". This pipe bed shall consist of selected granular material free from clay, lumps of earth, rock, and stone and shall have a sand equivalent value of not less than 30. For sand equivalent value reference is made to California Test Method 217-H California State Highway Materials Manual. This backfill material shall be carefully placed in 4" layers by hand tamping with a hand tamping bar approved by the Engineer. Water shall be added to the backfill when required by the Engineer. Prior to placing this special bedding, the pipe shall be supported on mounds of select material. The remainder of the backfill from 4" above the top of the pipe to the top of the trench shall be placed as specified in Section 5. Flooding of the backfill in the "pipe zone" may be permitted in lieu of hand tamping, provided the compaction requirements can be obtained. The Engineer will be the sole judge as to the method of consolidation or compaction used by the Contractor. The Contractor shall obtain a minimum relative compaction of 90% of maximum density in the "pipe zone".

Section 7 - Repaving Schedule

Materials and methods of construction for repaving shall conform to the "Standard Specifications for Public Works Construction 1970 Edition as adopted by the Los Angeles County Road Department and to Los Angeles County Road Department Standard Plan 40-01. The temporary resurfacing shall be with Type II asphaltic concrete and shall be left in place a minimum of 30 days.

Repaving requirements for the streets in which the proposed sewer is located are as follows:

Golden State Hwy. (Old Road) - (Rye Canyon Rd. to Castaic Creek)

Replace A. C. pavement area with ~~3"~~ 6" of Type II A. C. ~~over 7" of concrete~~ over ~~8"~~ 15" of aggregate base. Replace bituminous pavement shoulder area with Type II A. C. in kind plus one inch of thickness. See General Note 19, Sheet 1, for pavement adjustments.

Hasley Canyon Road Between Sec. 3, Sta. 52+30 & 60+65

Replace with ~~3"~~ 6" of Type II A. C. ~~over 7" of concrete~~ over ~~8"~~ 15" of aggregate base. See General Note 19, Sheet 1 for pavement adjustments.

All other pavement shall be replaced in kind plus 1" of thickness.

The Contractor is cautioned that the requirements for resurfacing as noted above do not necessarily reflect the thickness of existing pavement. Existing pavement may be of greater or lesser thickness than the required replacement.

Section 8 - Specifications for Vitrified Clay Pipe

The Contractor shall furnish and install extra strength mechanical compression joint vitrified clay pipe as shown on the drawings. The pipe shall be manufactured in accordance with Section 21 of the Standard Specifications except that the 15", 21" & 24" diameter vitrified clay pipe shall withstand 3-edge bearing loads shown below rather than as shown in Table 8 on Page 26 of the Standard Specifications. Allowable width of trench shall be as shown below rather than as shown in Table 11 on Page 34 of the Standard Specifications.

MAXIMUM ALLOWABLE TRENCH WIDTH IN INCHES

Pipe Size	3-Edge Bearing	Cover on Pipe in Feet 9'	10'	11'	12'	13'	14'	15'	16'	18'
15	3,100	42	41	40	39	38	37	36	35	34
21	4,200	53	51	50	48	46	45	44	43	41
24	4,800	59	56	55	53	51	49	48	47	45

Horizontal curves shall be constructed using beveled pipe which has a maximum bevel of 5° degrees on the spigot end. No one joint shall have a deflection greater than 5° degrees. The pipe used to construct the horizontal curves shall be factory fabricated to centerline radii shown on the drawings.

Section 9 - Specifications For Force Main Between Sta. 19+52 & 68+12

The 16" diameter force main between above stations shall be Asbestos-Cement Pressure Pipe as manufactured by Johns-Manville or Certain-Teed, or Reinforced Plastic Mortar Pipe (Techite) as manufactured by United Technology Center, except as noted herein.

The asbestos-cement pressure pipe alternate shall be grooved sleeve coupling with sealing rings of suitable size and cross-section to fill the grooves, class 150, tested at 525 pounds as manufactured by Johns-Manville or Certain-teed, to comply with AWWA Specification C-400-64T or Federal Specifications SS-p-351A. The sealing rings shall be buna-N rubber

NO.	SHEET	REVISIONS	INITIALS	DATE
14	13	REVISED REPAVING SCHEDULE		7-22-70
15	13	REVISED TRAFFIC REQUIREMENTS		7-30-70

COUNTY SANITATION DISTRICT NO. 32 OF LOS ANGELES COUNTY, CALIF.

SUBMITTED: OFFICE ENGINEER — MAY 12, 1970
RECOMMENDED: ENGINEER — MAY 12, 1970
APPROVED: CHIEF ENGINEER — MAY 12, 1970

DESIGNED
DRAWN
CHECKED
FIELD BOOK NO.

NOTES & SPECIFICATIONS
CASTAIC TRUNK SEWER SECTIONS 1, 2 & 3
AND
CASTAIC PUMPING PLANT FORCE MAIN

SCALE:

SHEET NO. 13 OF 15 SHEETS

DWG. NO. 32-P-6

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having a texture to insure a watertight and permanent seal.

The pipe manufacturer shall notify the Engineer 48 hours prior to the time the inspection and testing will take place. Prior to delivery, the pipe manufacturer shall furnish the Engineer a certification that the pipe has been sampled, tested, and inspected in accordance with the provisions of this specification.

Installation of the asbestos-cement pipe and joint deflection for curves shall be as outlined in manuals as furnished by the pipe manufacturer. The installing Contractor shall arrange with the manufacturer of the pipe for the services of a qualified pipe installation instructor to be on hand at the start of pipe assembly, during testing of the line and at other times during the installation, as necessary, to instruct in the proper assembly of pipe. This service does not include any inspection or design responsibility by the instructor or his employer.

The rubber gasket reinforced plastic mortar pipe alternate shall be manufactured using a resin binder, an aggregate filler and fiberglass reinforcement prescribed therefore in the United Technology Center Specification No. 01015 Form B, Revision C. The pipe shall be bell and spigot type having a single rubber gasket, class 150, tested at 450 psi. The dimensions of the bell and spigot shall be such that the joint can be pulled 3/4" open from normal closing without impairment of the tightness of the joint. The spigot end of the pipe measured at the groove shall have a thickness of approximately equal to the thickness of the wall of the pipe. The rubber gasket shall be seated in an accurately shaped groove on the spigot end of the pipe section. The gasket shall be of suitable cross section and size to fill the groove and provide a water-tight joint when the pipe is laid. The rubber gaskets shall be the sole element depended upon to make the joint watertight. The gaskets shall be of rubber of neoprene base having a texture to insure a watertight and permanent seal, and shall be a product of a manufacturer having at least 5 years' experience in the manufacturing of rubber gaskets for pipe joints. The rubber gasket joint shall be identical to that successfully manufactured by the pipe supplier for a period of at least 3 years.

The pipe manufacturer shall notify the Engineer 48 hours prior to the time the inspection and testing will take place. Prior to delivery, the pipe manufacturer shall furnish the Engineer a certification that the pipe has been sampled, tested, and inspected in accordance with the provisions of this specification.

Installation of the reinforced plastic mortar pipe and joint deflection for curves shall be as outlined in manuals as furnished by the pipe manufacturer. The installing contractor shall arrange with the manufacturer of the pipe for the services of a qualified pipe installation instructor to be on hand at the start of pipe assembly, during testing of the line and at other times during the installation, as necessary, to instruct in the proper assembly of pipe. This service does not include any inspection or design responsibility by the instructor or his employer.

The force main between Sta. 32+~~77.93~~ 76.85 and 33+43.~~54~~ .77, ⚠2 except the 45° victaulic elbows at Sta. 33+~~01.72~~ 00.64 and 33+19.~~72~~ .98, shall be constructed of 16" diameter ductile iron pipe, Class 2, per ASA spec. A21.50 and A21.51 with shouldered ends OD of 18.50" to accept victaulic couplings, Style 44. The two 16" diameter 45° victaulic elbows (A-1056) shall be gray cast iron compatible to the force main pipe and manufactured per ASA spec. A21.10 with shouldered ends having an OD of 18.50".

The 16" pressure pipe shall be subjected to a yard leakage test and a field leakage test. The yard leakage test shall be performed by the manufacturer prior to the laying of any pipe in the trench. Two specimens of the pipe manufactured shall be selected by the Engineer and pressure tested by assembling the two pieces together using the rubber gasket proposed to be used. The pipe ends shall be bulkheaded and the pipe section filled with water and allowed to stand to saturate the pipe walls. The saturation time shall be in accordance to the manufacturer's recommendations. The pipe sections shall be thoroughly bled of air and then subjected to a pressure of 50 psi and allowed to remain at least 1 hour. The total leakage from the tested sections shall not exceed one-half of the amount permitted for an equivalent length of pipe under the field leakage test required for the completed line.

After the 16" force main is completed, the Contractor shall properly bulkhead the pipe at Station 19+52 and fill the 16" force main between bulkhead and 16" main line gate valve outside pumping plant with water. After thoroughly bleeding the air from the system, the pipe shall be subjected to a hydrostatic pressure of 50 psig measured at the lower end of the force main. After the pipe has been saturated, the field leakage test shall not exceed 50 gallons per inch diameter per mile of pipe per day for a period of at least 4 hours.

Any repair of the line required to meet the leakage test shall be done by the Contractor. If the leakage is less than the amount specified, the Contractor shall stop any individual leaks that may be observed when ordered to do so by the Engineer.

The Contractor shall, at his expense, furnish all materials, bulkheads and labor for making the required tests.

Section 10 - Mark-Ups for Extra Work

15% will be added to the total amounts for labor, material, equipment rental and other direct costs of extra work to cover overhead and profit, including bonds and insurance. When all or any part of the extra work is performed by a subcontractor, an additional 5% will be added for the general contractor.

Section 11 - Gas and Water Service Connections

The gas and water service connections are not shown on the drawings. Prior to beginning construction, the Contractor shall contact the affected utility companies and obtain the locations of their service connections.

Section - Support of Conduits Crossing Sewer Trench

The Contractor shall provide temporary supports in a manner approved by the Engineer and permanent concrete pipe supports per S-a-217 under all existing concrete, asbestos cement and clay pipe lines and all conduits which are not tunneled and also under other conduits where requested by the owner, or by the Engineer.

Section 13 - Requirements Within Southern Pacific Company Property

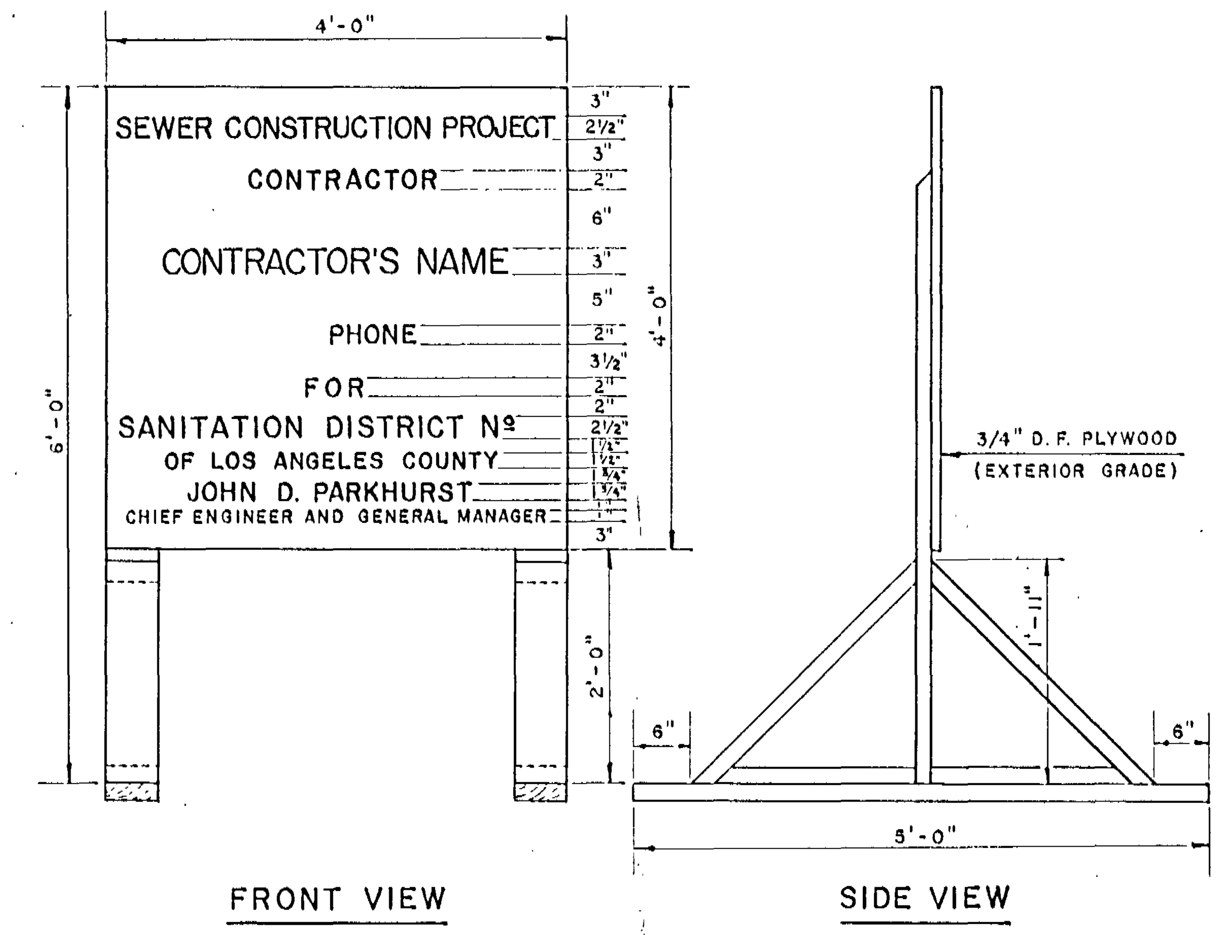
All work between sewer stations 2+03 and 3+06, as shown on Sheet 2, shall be in accordance with the requirements of the Southern Pacific Company. No sewer construction shall commence within the Southern Pacific Company property until authorization is obtained from the Engineer.

Prior to commencing construction within the Southern Pacific Company's property, the Contractor shall enter into an indemnification agreement with Southern Pacific Company. This agreement shall require the Contractor to provide the Company with a certified copy of an insurance policy, terminal upon completion of work and acceptance by District covering the contractorial liability under this agreement. The limits of the policy shall be not less than $500,000/1,000,000 bodily injury and $500,000/1,000,000 property damage. This agreement shall also specify that the Contractor shall reimburse the Southern Pacific Company for any and all expenses incurred by the Company as a result of this construction and shall deposit $500 with the Company to cover these expenses. Any portion of this deposit remaining after construction is completed will be returned to the Contractor.

⚠ Between sewer Stations ~~2+37~~ 2+25 and ~~2+69~~ 2+81, as indicated on the drawings, the Contractor shall jack into place a 45" diameter steel casing having a minimum wall thickness of 3/8" and shall install the pipe within the casing. All voids outside of the casing and between the casing and the sewer pipe shall be filled with cement-sand grout placed under pressure. All cement-sand grout shall have 8 sacks of cement per cubic yard of grout.

No part of the excavation shall be closer than 15' to the centerline of the railroad track measured at right angles to the track. The jacking pit perimeter and the foreface of the excavation adjacent to track shall be solid sheeted, and timbers used for sheeting shall extend 3-1/2 feet above the ground surface. All timbers and supports shall be designed to withstand an E-72 train load. The Contractor shall submit to and obtain approval of the Engineer of his method of solid sheeting prior to commencing construction.

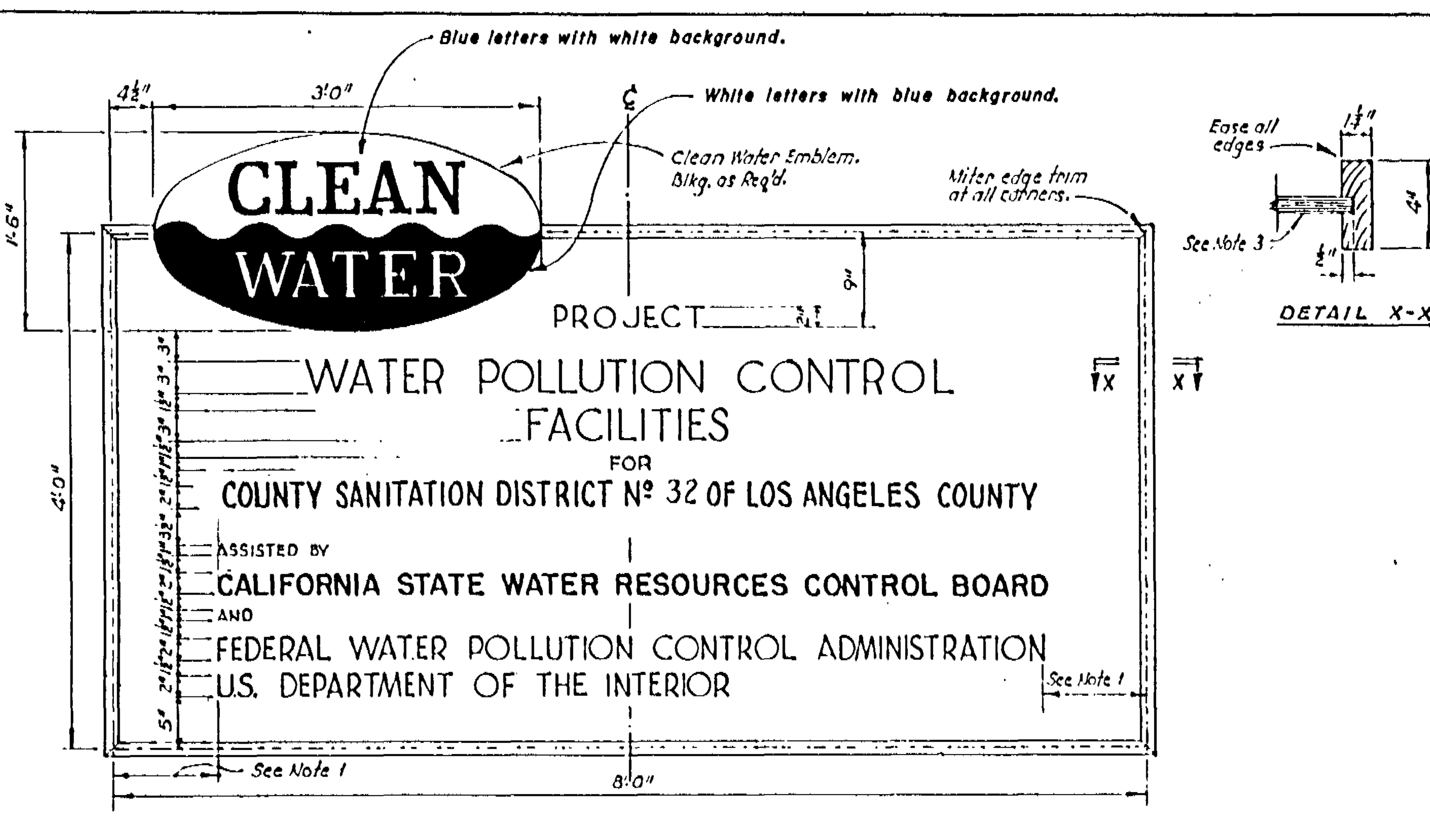
The Contractor shall notify Mr. J. R. Meyer, Assistant Engineer, Southern Pacific Company, 610 South Main Street, Los Angeles, California 90014, telephone (213) 624-6161, Ext. 22778, five working days prior to commencing construction within the Southern Pacific Company property.



NOTES:

1. ALL FRAMING LUMBER TO BE 2" x 6" S4S D.F.
2. ENTIRE SIGNS, INCLUDING FRAMING, TO BE PAINTED WITH TWO COATS OF EXTERIOR OIL BASE WHITE PAINT.
3. LETTERING TO BE DONE IN BLACK BY QUALIFIED SIGN PAINTER AND TO THE SATISFACTION OF THE ENGINEER.
4. SIGNS TO BE MAINTAINED IN A CONDITION SATISFACTORY TO THE ENGINEER.
5. SIGNS TO BE FURNISHED BY CONTRACTOR AND INSTALLED AND MOVED BY CONTRACTOR AS DIRECTED BY THE ENGINEER.

PROJECT SIGNS
(2 REQUIRED)



CLEAN WATER SIGN

Notes

1. All lines shall be kept in vertical alignment at left border of sign. Left border shall be determined using the longest line centered on the sign providing equal borders. The Rt. border for other than longest line shall vary as required.
2. Provide adequate supports for sign as site conditions may require and keep sign a proper distance above prevailing grade to permit public viewing.
3. Exterior type high density overlaid plywood or other approved material suitable for signs.
4. The style of letters and spacing shall be in accordance with those shown.
5. Paint letters blue, background and all other sign components white. Blue No. 15102 in Federal Color Standard No. 595.
6. Duplicate standard "Clean Water" emblem. The lettering style shall be as shown. Set emblem on edge trim of sign. Provide supports for rigid installation.
7. The "Clean Water" sign and support frame will be furnished by the District at no cost to the Contractor. The sign will be delivered to the job site but the Contractor shall move the sign as directed by the Engineer. Upon completion of the project, the Contractor shall return the sign in good condition to the District.

COUNTY SANITATION DISTRICT NO. 32 OF LOS ANGELES COUNTY, CALIF.

NOTES & SPECIFICATIONS
CASTAIC TRUNK SEWER SECTIONS 1, 2 & 3 AND CASTAIC PUMPING PLANT FORCE MAIN

DESIGNED | SUBMITTED | MAY 12, 1970
DRAWN | RECOMMENDED | MAY 15, 1970
CHECKED 5-2-72 | APPROVED | MAY 15, 1970
FIELD BOOK NO.

SCALE:
SHEET NO. 14 OF 15 SHEETS
DWG. NO.

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Section 14 - Federal Grant Requirements

Application has been made by County Sanitation District No. 8 for a federal construction grant for this project as authorized under provisions of the Federal Water Pollution Control Act. The contract for this project, and all subcontracts, shall contain the stipulations and provisions issued by the Secretary of Health, Education and Welfare in "Labor Standards - Contract Provisions", a copy of which is included herein and are hereby made a part of the contract documents.

Section 15 - Nondiscrimination in Employment

The contract for work under this proposal will obligate the contractor and subcontractors not to discriminate in employment practices.

Bidders must submit with their initial bid a signed statement as to whether they have previously performed work subject to the President's Executive Order No. 10925.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract.

The successful bidder must submit a list of all subcontractors who will perform work on the project and, if requested, written signed statements from authorized agents of the labor pools with which they will or may deal for employees on the work, together with supporting information to the effect that said labor pools' practices and policies are in conformity with Executive Order No. 10925 as amended by Executive Order No. 11114 and that said labor pools will affirmatively cooperate in or offer no hinderance to the recruitment, employment and equal treatment of employees seeking employment and performing work under this contract, or a certification as to what efforts have been made to secure such statements when such agents or labor pools have failed or refused to furnish same prior to the award of the contract.

The successful bidder must be prepared to comply in all respects with the contract provisions regarding nondiscrimination.

Section 16 - Minimum Pay Rates

The construction contract, and all subcontracts, shall prescribe the minimum rates of pay for laborers and mechanics engaged in the construction of the project as determined by the Secretary of Labor in accordance with the Davis-Bacon Act.

A copy of the federal minimum wage rates is included herein and is hereby made a part of the contract documents.

If conflict exists between the federal minimum wage rates and the prevailing wage rates ascertained by the Board of Directors of the District, the higher minimum wage shall be prescribed.

Section 17 - Statement of Compliance

A statement of compliance with the regulations stated herein must be signed weekly by the Contractor. A file of these statements, along with the payrolls, must be maintained by the Contractor and the District for a period of at least three years.

LABOR STANDARDS

Contract Provisions

FEBRUARY 1959

(1) *Minimum wages.* (i) All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amounts due at time of payment computed at wage rates not less than those contained in the wage determination decision of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics: and the wage determination decision shall be posted by the contractor at the site of the work in a prominent place where it can be easily seen by the workers. For the purpose of this clause, contributions made or costs reasonably anticipated under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of (1)(iv) hereof. Also for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

(ii) The contracting officer shall require that any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary of Labor for final determination.

(iii) The contracting officer shall require whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly wage rate and the contractor is obligated to pay a cash equivalent of such a fringe benefit, an hourly cash equivalent thereof to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the contracting officer, shall be referred to the Secretary of Labor for determination.

(iv) If the contractor does not make payments to a trustee or other third person, he may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing benefits under a plan or program of a type expressly listed in the wage determination decision of the Secretary of Labor which is a part of this contract: *Provided, however,* The Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) *Withholding.*

The Federal Water Pollution Control Administration may withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics employed by the contractor or any subcontractor on the work, the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic employed or working on the site of the work all or part of the wages required by the contract, the Federal Water Pollution Control Administration may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) *Payrolls and basic records.* (i) Payrolls and basic records relating thereto will be maintained during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records will contain the name and address of each such employee, his correct classification, rates of pay (including rates of contributions or costs anticipated of the types described in section 1 (b) (2) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found (as provided for by (1) (iv) hereof) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1 (b) (2) (B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(ii) The contractor will submit weekly a copy of all payrolls to the applicant, sponsor, or owner, as the case may be. The copy shall be accompanied by a statement signed by the employer or his agent indicating that the payrolls are correct and complete, that the wage rates contained therein are not less than those determined by the Secretary of Labor and that the classifications set forth for each laborer or mechanic conform with the work he performed. A submission of a "Weekly Statement of Compliance" which is required under this contract and the Copeland regulations of the Secretary of Labor (29 CFR, Part 3) and the filing with the initial payroll or any subsequent payroll of a copy of any findings by the Secretary of Labor pursuant to (1) (iv) hereof shall satisfy this requirement. The prime contractor shall be responsible for the submission of copies of payrolls of all subcontractors. The contractor will make the records required under the labor standards clauses of the contract available for inspection by authorized representatives of the Federal Water Pollution Control Administration and the Department of Labor, and will permit such representatives to interview employees during working hours on the job.

(4) *Apprentices.* Apprentices will be permitted to work as such only when they are registered, individually, under a bona fide apprenticeship program registered with a State apprenticeship agency which is recognized by the Bureau of Apprenticeship and Training, United States Department of Labor; or, if no such recognized agency exists in a State, under a program registered with the Bureau of Apprenticeship and Training, United States Department of Labor. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ratio permitted to the contractor as to his entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered as above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish to the contracting officer written evidence of the registration of his program and apprentices as well as of the appropriate ratios and wages rates, for the area of construction prior to using any apprentices on the contract work.

(5) *Compliance with Copeland Regulations (29 CFR Part 3).* The contractor shall comply with the Copeland Regulations (29 CFR Part 3) of the Secretary of Labor which are herein incorporated by reference.

(6) *Subcontracts.* The contractor will insert in any subcontracts clauses (1) through (5) and (7) hereof and such other clauses as the Federal Water Pollution Control Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

(7) *Contract termination; debarment.* A breach of clauses (1) through (6) may be grounds for termination of the contract, and for debarment as provided in Regulations of the Secretary of Labor at 29 CFR 5.6.

(8) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of eight hours in any calendar day or in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of eight hours in any calendar day or in excess of forty hours in such workweek, as the case may be.

(9) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (8), the contractor and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such district or such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of the clause set forth in paragraph (8), in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (8).

(10) *Withholding for unpaid wages and liquidated damages.* The Federal Water Pollution Control Administration may withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (9).

(11) *Subcontracts.* The contractor shall insert in any subcontracts the clauses set forth in paragraphs (8), (9), and (10) hereof and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

NON DISCRIMINATION PROVISIONS TO BE INCLUDED IN FEDERALLY ASSISTED CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, [illegible]

U.S. DEPARTMENT OF LABOR

OFFICE OF THE SECRETARY

WASHINGTON

DECISION OF THE SECRETARY

This case is before the Department of Labor pursuant to a request for a wage predetermination as required by law applicable to the work described.

A study has been made of wage conditions in the locality and based on information available to the Department of Labor the wage rates and fringe payments listed are hereby determined by the Secretary of Labor as prevailing for the described classes of labor in accordance with applicable law.

This wage determination decision and any modifications thereof during the period prior to the stated expiration date shall be made a part of every contract for performance of the described work as provided by applicable law and regulations of the Secretary of Labor, and the wage rates and fringe payments contained in this decision, including modifications, shall be the minimums to be paid under any such contract by contractors and subcontractors on the work.

The contracting officer shall require that any class of laborers and mechanics which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination, and a report of the action taken shall be sent by the Federal agency to the Secretary of Labor. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary for determination.

Before using apprentices on the job the contractor shall present to the contracting officer written evidence of registration of such employees in a program of a State apprenticeship and training agency approved and recognized by the U.S. Bureau of Apprenticeship and Training. In the absence of such a State agency, the contractor shall submit evidence of approval and registration by the U.S. Bureau of Apprenticeship and Training.

The contractor shall submit to the contracting officer written evidence of the established apprentice-journeyman ratios and wage rates in the project area, which will be the basis for establishing such ratios and rates for the project under the applicable contract provisions.

Fringe payments include medical and hospital care, compensation for injuries or illness resulting from occupational activity, unemployment benefits, life insurance, disability and sickness insurance, accident insurance (all designated as health and welfare), pensions, vacation and holiday pay, apprenticeship or other similar programs and other bona fide fringe benefits.

By Direction of the Secretary of Labor,

E. Irving Manger

E. IRVING MANGER, Associate Administrator
Division of Wage Determinations
Wage and Labor Standards Administration

[illegible]

COUNTY SANITATION DISTRICT NO. 32
OF LOS ANGELES COUNTY, CALIF.

NOTES & SPECIFICATIONS
CASTAIC TRUNK SEWER SECTIONS 1, 2 & 3
AND
CASTAIC PUMPING PLANT-FORCE MAIN

DESIGNED	[illegible]	
DRAWN		
CHECKED		5-12-70
SUBMITTED		MAY 12, 1970
RECOMMENDED		MAY 12, 1970
APPROVED	CHIEF ENGINEER	MAY 12, 1970
FIELD BOOK NO.		

SCALE:

SHEET NO. 15 OF 15 SHEETS

DWG. NO. 32-P-6

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4. RATING TABLE FOR SEWER PIPE

Rating Table for 8 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.33	ft
Diameter	0.66	ft

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.00400	0.34	1.98	0.17	1.04	0.66
0.00440	0.36	2.08	0.17	1.04	0.66
0.00480	0.37	2.17	0.17	1.04	0.66
0.00520	0.39	2.26	0.17	1.04	0.66
0.00560	0.40	2.35	0.17	1.04	0.66
0.00600	0.42	2.43	0.17	1.04	0.66
0.00640	0.43	2.51	0.17	1.04	0.66
0.00680	0.44	2.59	0.17	1.04	0.66
0.00720	0.46	2.66	0.17	1.04	0.66
0.00760	0.47	2.74	0.17	1.04	0.66
0.00800	0.48	2.81	0.17	1.04	0.66
0.00840	0.49	2.88	0.17	1.04	0.66
0.00880	0.50	2.95	0.17	1.04	0.66
0.00920	0.52	3.01	0.17	1.04	0.66
0.00960	0.53	3.08	0.17	1.04	0.66
0.01000	0.54	3.14	0.17	1.04	0.66
0.01040	0.55	3.21	0.17	1.04	0.66
0.01080	0.56	3.27	0.17	1.04	0.66
0.01120	0.57	3.33	0.17	1.04	0.66
0.01160	0.58	3.39	0.17	1.04	0.66
0.01200	0.59	3.44	0.17	1.04	0.66
0.01240	0.60	3.50	0.17	1.04	0.66
0.01280	0.61	3.56	0.17	1.04	0.66
0.01320	0.62	3.61	0.17	1.04	0.66
0.01360	0.63	3.67	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01400	0.64	3.72	0.17	1.04	0.66
0.01440	0.65	3.77	0.17	1.04	0.66
0.01480	0.65	3.83	0.17	1.04	0.66
0.01520	0.66	3.88	0.17	1.04	0.66
0.01560	0.67	3.93	0.17	1.04	0.66
0.01600	0.68	3.98	0.17	1.04	0.66
0.01640	0.69	4.03	0.17	1.04	0.66
0.01680	0.70	4.08	0.17	1.04	0.66
0.01720	0.71	4.13	0.17	1.04	0.66
0.01760	0.71	4.17	0.17	1.04	0.66
0.01800	0.72	4.22	0.17	1.04	0.66
0.01840	0.73	4.27	0.17	1.04	0.66
0.01880	0.74	4.31	0.17	1.04	0.66
0.01920	0.75	4.36	0.17	1.04	0.66
0.01960	0.75	4.41	0.17	1.04	0.66
0.02000	0.76	4.45	0.17	1.04	0.66
0.02040	0.77	4.50	0.17	1.04	0.66
0.02080	0.78	4.54	0.17	1.04	0.66
0.02120	0.78	4.58	0.17	1.04	0.66
0.02160	0.79	4.63	0.17	1.04	0.66
0.02200	0.80	4.67	0.17	1.04	0.66
0.02240	0.81	4.71	0.17	1.04	0.66
0.02280	0.81	4.75	0.17	1.04	0.66
0.02320	0.82	4.79	0.17	1.04	0.66
0.02360	0.83	4.84	0.17	1.04	0.66
0.02400	0.83	4.88	0.17	1.04	0.66
0.02440	0.84	4.92	0.17	1.04	0.66
0.02480	0.85	4.96	0.17	1.04	0.66
0.02520	0.85	5.00	0.17	1.04	0.66
0.02560	0.86	5.04	0.17	1.04	0.66
0.02600	0.87	5.08	0.17	1.04	0.66
0.02640	0.87	5.11	0.17	1.04	0.66
0.02680	0.88	5.15	0.17	1.04	0.66
0.02720	0.89	5.19	0.17	1.04	0.66
0.02760	0.89	5.23	0.17	1.04	0.66
0.02800	0.90	5.27	0.17	1.04	0.66
0.02840	0.91	5.31	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02880	0.91	5.34	0.17	1.04	0.66
0.02920	0.92	5.38	0.17	1.04	0.66
0.02960	0.93	5.42	0.17	1.04	0.66
0.03000	0.93	5.45	0.17	1.04	0.66
0.03040	0.94	5.49	0.17	1.04	0.66
0.03080	0.95	5.53	0.17	1.04	0.66
0.03120	0.95	5.56	0.17	1.04	0.66
0.03160	0.96	5.60	0.17	1.04	0.66
0.03200	0.96	5.63	0.17	1.04	0.66
0.03240	0.97	5.67	0.17	1.04	0.66
0.03280	0.98	5.70	0.17	1.04	0.66
0.03320	0.98	5.74	0.17	1.04	0.66
0.03360	0.99	5.77	0.17	1.04	0.66
0.03400	0.99	5.81	0.17	1.04	0.66
0.03440	1.00	5.84	0.17	1.04	0.66
0.03480	1.00	5.87	0.17	1.04	0.66
0.03520	1.01	5.91	0.17	1.04	0.66
0.03560	1.02	5.94	0.17	1.04	0.66
0.03600	1.02	5.97	0.17	1.04	0.66
0.03640	1.03	6.01	0.17	1.04	0.66
0.03680	1.03	6.04	0.17	1.04	0.66
0.03720	1.04	6.07	0.17	1.04	0.66
0.03760	1.04	6.11	0.17	1.04	0.66
0.03800	1.05	6.14	0.17	1.04	0.66
0.03840	1.06	6.17	0.17	1.04	0.66
0.03880	1.06	6.20	0.17	1.04	0.66
0.03920	1.07	6.23	0.17	1.04	0.66
0.03960	1.07	6.27	0.17	1.04	0.66
0.04000	1.08	6.30	0.17	1.04	0.66
0.04040	1.08	6.33	0.17	1.04	0.66
0.04080	1.09	6.36	0.17	1.04	0.66
0.04120	1.09	6.39	0.17	1.04	0.66
0.04160	1.10	6.42	0.17	1.04	0.66
0.04200	1.10	6.45	0.17	1.04	0.66
0.04240	1.11	6.48	0.17	1.04	0.66
0.04280	1.11	6.51	0.17	1.04	0.66
0.04320	1.12	6.55	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.04360	1.12	6.58	0.17	1.04	0.66
0.04400	1.13	6.61	0.17	1.04	0.66
0.04440	1.14	6.64	0.17	1.04	0.66
0.04480	1.14	6.67	0.17	1.04	0.66
0.04520	1.15	6.70	0.17	1.04	0.66
0.04560	1.15	6.72	0.17	1.04	0.66
0.04600	1.16	6.75	0.17	1.04	0.66
0.04640	1.16	6.78	0.17	1.04	0.66
0.04680	1.17	6.81	0.17	1.04	0.66
0.04720	1.17	6.84	0.17	1.04	0.66
0.04760	1.18	6.87	0.17	1.04	0.66
0.04800	1.18	6.90	0.17	1.04	0.66
0.04840	1.19	6.93	0.17	1.04	0.66
0.04880	1.19	6.96	0.17	1.04	0.66
0.04920	1.19	6.99	0.17	1.04	0.66
0.04960	1.20	7.01	0.17	1.04	0.66
0.05000	1.20	7.04	0.17	1.04	0.66
0.05040	1.21	7.07	0.17	1.04	0.66
0.05080	1.21	7.10	0.17	1.04	0.66
0.05120	1.22	7.13	0.17	1.04	0.66
0.05160	1.22	7.15	0.17	1.04	0.66
0.05200	1.23	7.18	0.17	1.04	0.66
0.05240	1.23	7.21	0.17	1.04	0.66
0.05280	1.24	7.24	0.17	1.04	0.66
0.05320	1.24	7.26	0.17	1.04	0.66
0.05360	1.25	7.29	0.17	1.04	0.66
0.05400	1.25	7.32	0.17	1.04	0.66
0.05440	1.26	7.35	0.17	1.04	0.66
0.05480	1.26	7.37	0.17	1.04	0.66
0.05520	1.27	7.40	0.17	1.04	0.66
0.05560	1.27	7.43	0.17	1.04	0.66
0.05600	1.27	7.45	0.17	1.04	0.66
0.05640	1.28	7.48	0.17	1.04	0.66
0.05680	1.28	7.51	0.17	1.04	0.66
0.05720	1.29	7.53	0.17	1.04	0.66
0.05760	1.29	7.56	0.17	1.04	0.66
0.05800	1.30	7.58	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.05840	1.30	7.61	0.17	1.04	0.66
0.05880	1.31	7.64	0.17	1.04	0.66
0.05920	1.31	7.66	0.17	1.04	0.66
0.05960	1.32	7.69	0.17	1.04	0.66
0.06000	1.32	7.71	0.17	1.04	0.66
0.06040	1.32	7.74	0.17	1.04	0.66
0.06080	1.33	7.77	0.17	1.04	0.66
0.06120	1.33	7.79	0.17	1.04	0.66
0.06160	1.34	7.82	0.17	1.04	0.66
0.06200	1.34	7.84	0.17	1.04	0.66
0.06240	1.35	7.87	0.17	1.04	0.66
0.06280	1.35	7.89	0.17	1.04	0.66
0.06320	1.35	7.92	0.17	1.04	0.66
0.06360	1.36	7.94	0.17	1.04	0.66
0.06400	1.36	7.97	0.17	1.04	0.66
0.06440	1.37	7.99	0.17	1.04	0.66
0.06480	1.37	8.02	0.17	1.04	0.66
0.06520	1.38	8.04	0.17	1.04	0.66
0.06560	1.38	8.07	0.17	1.04	0.66
0.06600	1.38	8.09	0.17	1.04	0.66
0.06640	1.39	8.12	0.17	1.04	0.66
0.06680	1.39	8.14	0.17	1.04	0.66
0.06720	1.40	8.16	0.17	1.04	0.66
0.06760	1.40	8.19	0.17	1.04	0.66
0.06800	1.40	8.21	0.17	1.04	0.66
0.06840	1.41	8.24	0.17	1.04	0.66
0.06880	1.41	8.26	0.17	1.04	0.66
0.06920	1.42	8.29	0.17	1.04	0.66
0.06960	1.42	8.31	0.17	1.04	0.66
0.07000	1.43	8.33	0.17	1.04	0.66
0.07040	1.43	8.36	0.17	1.04	0.66
0.07080	1.43	8.38	0.17	1.04	0.66
0.07120	1.44	8.40	0.17	1.04	0.66
0.07160	1.44	8.43	0.17	1.04	0.66
0.07200	1.45	8.45	0.17	1.04	0.66
0.07240	1.45	8.48	0.17	1.04	0.66
0.07280	1.45	8.50	0.17	1.04	0.66

Rating Table for 8 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.07320	1.46	8.52	0.17	1.04	0.66
0.07360	1.46	8.55	0.17	1.04	0.66
0.07400	1.47	8.57	0.17	1.04	0.66
0.07440	1.47	8.59	0.17	1.04	0.66
0.07480	1.47	8.61	0.17	1.04	0.66
0.07520	1.48	8.64	0.17	1.04	0.66
0.07560	1.48	8.66	0.17	1.04	0.66
0.07600	1.49	8.68	0.17	1.04	0.66
0.07640	1.49	8.71	0.17	1.04	0.66
0.07680	1.49	8.73	0.17	1.04	0.66
0.07720	1.50	8.75	0.17	1.04	0.66
0.07760	1.50	8.77	0.17	1.04	0.66
0.07800	1.50	8.80	0.17	1.04	0.66
0.07840	1.51	8.82	0.17	1.04	0.66
0.07880	1.51	8.84	0.17	1.04	0.66
0.07920	1.52	8.86	0.17	1.04	0.66
0.07960	1.52	8.89	0.17	1.04	0.66
0.08000	1.52	8.91	0.17	1.04	0.66

Rating Table for 10 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.42	ft
Diameter	0.83	ft

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.00320	0.58	2.12	0.27	1.31	0.83
0.00360	0.61	2.25	0.27	1.31	0.83
0.00400	0.65	2.37	0.27	1.31	0.83
0.00440	0.68	2.49	0.27	1.31	0.83
0.00480	0.71	2.60	0.27	1.31	0.83
0.00520	0.74	2.71	0.27	1.31	0.83
0.00560	0.77	2.81	0.27	1.31	0.83
0.00600	0.79	2.91	0.27	1.31	0.83
0.00640	0.82	3.01	0.27	1.31	0.83
0.00680	0.84	3.10	0.27	1.31	0.83
0.00720	0.87	3.19	0.27	1.31	0.83
0.00760	0.89	3.28	0.27	1.31	0.83
0.00800	0.92	3.37	0.27	1.31	0.83
0.00840	0.94	3.45	0.27	1.31	0.83
0.00880	0.96	3.53	0.27	1.31	0.83
0.00920	0.98	3.61	0.27	1.31	0.83
0.00960	1.00	3.69	0.27	1.31	0.83
0.01000	1.02	3.77	0.27	1.31	0.83
0.01040	1.05	3.84	0.27	1.31	0.83
0.01080	1.07	3.91	0.27	1.31	0.83
0.01120	1.08	3.99	0.27	1.31	0.83
0.01160	1.10	4.06	0.27	1.31	0.83
0.01200	1.12	4.13	0.27	1.31	0.83
0.01240	1.14	4.20	0.27	1.31	0.83
0.01280	1.16	4.26	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.01320	1.18	4.33	0.27	1.31	0.83
0.01360	1.20	4.40	0.27	1.31	0.83
0.01400	1.21	4.46	0.27	1.31	0.83
0.01440	1.23	4.52	0.27	1.31	0.83
0.01480	1.25	4.59	0.27	1.31	0.83
0.01520	1.26	4.65	0.27	1.31	0.83
0.01560	1.28	4.71	0.27	1.31	0.83
0.01600	1.30	4.77	0.27	1.31	0.83
0.01640	1.31	4.83	0.27	1.31	0.83
0.01680	1.33	4.89	0.27	1.31	0.83
0.01720	1.35	4.94	0.27	1.31	0.83
0.01760	1.36	5.00	0.27	1.31	0.83
0.01800	1.38	5.06	0.27	1.31	0.83
0.01840	1.39	5.11	0.27	1.31	0.83
0.01880	1.41	5.17	0.27	1.31	0.83
0.01920	1.42	5.22	0.27	1.31	0.83
0.01960	1.44	5.28	0.27	1.31	0.83
0.02000	1.45	5.33	0.27	1.31	0.83
0.02040	1.47	5.39	0.27	1.31	0.83
0.02080	1.48	5.44	0.27	1.31	0.83
0.02120	1.49	5.49	0.27	1.31	0.83
0.02160	1.51	5.54	0.27	1.31	0.83
0.02200	1.52	5.59	0.27	1.31	0.83
0.02240	1.54	5.64	0.27	1.31	0.83
0.02280	1.55	5.69	0.27	1.31	0.83
0.02320	1.56	5.74	0.27	1.31	0.83
0.02360	1.58	5.79	0.27	1.31	0.83
0.02400	1.59	5.84	0.27	1.31	0.83
0.02440	1.60	5.89	0.27	1.31	0.83
0.02480	1.62	5.94	0.27	1.31	0.83
0.02520	1.63	5.99	0.27	1.31	0.83
0.02560	1.64	6.03	0.27	1.31	0.83
0.02600	1.65	6.08	0.27	1.31	0.83
0.02640	1.67	6.13	0.27	1.31	0.83
0.02680	1.68	6.17	0.27	1.31	0.83
0.02720	1.69	6.22	0.27	1.31	0.83
0.02760	1.70	6.27	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02800	1.72	6.31	0.27	1.31	0.83
0.02840	1.73	6.36	0.27	1.31	0.83
0.02880	1.74	6.40	0.27	1.31	0.83
0.02920	1.75	6.45	0.27	1.31	0.83
0.02960	1.77	6.49	0.27	1.31	0.83
0.03000	1.78	6.53	0.27	1.31	0.83
0.03040	1.79	6.58	0.27	1.31	0.83
0.03080	1.80	6.62	0.27	1.31	0.83
0.03120	1.81	6.66	0.27	1.31	0.83
0.03160	1.82	6.71	0.27	1.31	0.83
0.03200	1.84	6.75	0.27	1.31	0.83
0.03240	1.85	6.79	0.27	1.31	0.83
0.03280	1.86	6.83	0.27	1.31	0.83
0.03320	1.87	6.87	0.27	1.31	0.83
0.03360	1.88	6.91	0.27	1.31	0.83
0.03400	1.89	6.96	0.27	1.31	0.83
0.03440	1.90	7.00	0.27	1.31	0.83
0.03480	1.91	7.04	0.27	1.31	0.83
0.03520	1.93	7.08	0.27	1.31	0.83
0.03560	1.94	7.12	0.27	1.31	0.83
0.03600	1.95	7.16	0.27	1.31	0.83
0.03640	1.96	7.20	0.27	1.31	0.83
0.03680	1.97	7.24	0.27	1.31	0.83
0.03720	1.98	7.28	0.27	1.31	0.83
0.03760	1.99	7.32	0.27	1.31	0.83
0.03800	2.00	7.35	0.27	1.31	0.83
0.03840	2.01	7.39	0.27	1.31	0.83
0.03880	2.02	7.43	0.27	1.31	0.83
0.03920	2.03	7.47	0.27	1.31	0.83
0.03960	2.04	7.51	0.27	1.31	0.83
0.04000	2.05	7.55	0.27	1.31	0.83
0.04040	2.06	7.58	0.27	1.31	0.83
0.04080	2.07	7.62	0.27	1.31	0.83
0.04120	2.08	7.66	0.27	1.31	0.83
0.04160	2.09	7.69	0.27	1.31	0.83
0.04200	2.10	7.73	0.27	1.31	0.83
0.04240	2.11	7.77	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.04280	2.12	7.80	0.27	1.31	0.83
0.04320	2.13	7.84	0.27	1.31	0.83
0.04360	2.14	7.88	0.27	1.31	0.83
0.04400	2.15	7.91	0.27	1.31	0.83
0.04440	2.16	7.95	0.27	1.31	0.83
0.04480	2.17	7.99	0.27	1.31	0.83
0.04520	2.18	8.02	0.27	1.31	0.83
0.04560	2.19	8.06	0.27	1.31	0.83
0.04600	2.20	8.09	0.27	1.31	0.83
0.04640	2.21	8.13	0.27	1.31	0.83
0.04680	2.22	8.16	0.27	1.31	0.83
0.04720	2.23	8.20	0.27	1.31	0.83
0.04760	2.24	8.23	0.27	1.31	0.83
0.04800	2.25	8.27	0.27	1.31	0.83
0.04840	2.26	8.30	0.27	1.31	0.83
0.04880	2.27	8.33	0.27	1.31	0.83
0.04920	2.28	8.37	0.27	1.31	0.83
0.04960	2.29	8.40	0.27	1.31	0.83
0.05000	2.30	8.44	0.27	1.31	0.83
0.05040	2.30	8.47	0.27	1.31	0.83
0.05080	2.31	8.50	0.27	1.31	0.83
0.05120	2.32	8.54	0.27	1.31	0.83
0.05160	2.33	8.57	0.27	1.31	0.83
0.05200	2.34	8.60	0.27	1.31	0.83
0.05240	2.35	8.64	0.27	1.31	0.83
0.05280	2.36	8.67	0.27	1.31	0.83
0.05320	2.37	8.70	0.27	1.31	0.83
0.05360	2.38	8.74	0.27	1.31	0.83
0.05400	2.39	8.77	0.27	1.31	0.83
0.05440	2.39	8.80	0.27	1.31	0.83
0.05480	2.40	8.83	0.27	1.31	0.83
0.05520	2.41	8.86	0.27	1.31	0.83
0.05560	2.42	8.90	0.27	1.31	0.83
0.05600	2.43	8.93	0.27	1.31	0.83
0.05640	2.44	8.96	0.27	1.31	0.83
0.05680	2.45	8.99	0.27	1.31	0.83
0.05720	2.46	9.02	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05760	2.46	9.06	0.27	1.31	0.83
0.05800	2.47	9.09	0.27	1.31	0.83
0.05840	2.48	9.12	0.27	1.31	0.83
0.05880	2.49	9.15	0.27	1.31	0.83
0.05920	2.50	9.18	0.27	1.31	0.83
0.05960	2.51	9.21	0.27	1.31	0.83
0.06000	2.51	9.24	0.27	1.31	0.83
0.06040	2.52	9.27	0.27	1.31	0.83
0.06080	2.53	9.30	0.27	1.31	0.83
0.06120	2.54	9.33	0.27	1.31	0.83
0.06160	2.55	9.36	0.27	1.31	0.83
0.06200	2.56	9.40	0.27	1.31	0.83
0.06240	2.56	9.43	0.27	1.31	0.83
0.06280	2.57	9.46	0.27	1.31	0.83
0.06320	2.58	9.49	0.27	1.31	0.83
0.06360	2.59	9.52	0.27	1.31	0.83
0.06400	2.60	9.55	0.27	1.31	0.83
0.06440	2.61	9.58	0.27	1.31	0.83
0.06480	2.61	9.61	0.27	1.31	0.83
0.06520	2.62	9.63	0.27	1.31	0.83
0.06560	2.63	9.66	0.27	1.31	0.83
0.06600	2.64	9.69	0.27	1.31	0.83
0.06640	2.65	9.72	0.27	1.31	0.83
0.06680	2.65	9.75	0.27	1.31	0.83
0.06720	2.66	9.78	0.27	1.31	0.83
0.06760	2.67	9.81	0.27	1.31	0.83
0.06800	2.68	9.84	0.27	1.31	0.83
0.06840	2.69	9.87	0.27	1.31	0.83
0.06880	2.69	9.90	0.27	1.31	0.83
0.06920	2.70	9.93	0.27	1.31	0.83
0.06960	2.71	9.95	0.27	1.31	0.83
0.07000	2.72	9.98	0.27	1.31	0.83
0.07040	2.72	10.01	0.27	1.31	0.83
0.07080	2.73	10.04	0.27	1.31	0.83
0.07120	2.74	10.07	0.27	1.31	0.83
0.07160	2.75	10.10	0.27	1.31	0.83
0.07200	2.75	10.13	0.27	1.31	0.83

Rating Table for 10 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.07240	2.76	10.15	0.27	1.31	0.83
0.07280	2.77	10.18	0.27	1.31	0.83
0.07320	2.78	10.21	0.27	1.31	0.83
0.07360	2.79	10.24	0.27	1.31	0.83
0.07400	2.79	10.26	0.27	1.31	0.83
0.07440	2.80	10.29	0.27	1.31	0.83
0.07480	2.81	10.32	0.27	1.31	0.83
0.07520	2.82	10.35	0.27	1.31	0.83
0.07560	2.82	10.38	0.27	1.31	0.83
0.07600	2.83	10.40	0.27	1.31	0.83
0.07640	2.84	10.43	0.27	1.31	0.83
0.07680	2.85	10.46	0.27	1.31	0.83
0.07720	2.85	10.48	0.27	1.31	0.83
0.07760	2.86	10.51	0.27	1.31	0.83
0.07800	2.87	10.54	0.27	1.31	0.83
0.07840	2.87	10.57	0.27	1.31	0.83
0.07880	2.88	10.59	0.27	1.31	0.83
0.07920	2.89	10.62	0.27	1.31	0.83
0.07960	2.90	10.65	0.27	1.31	0.83
0.08000	2.90	10.67	0.27	1.31	0.83

Rating Table for 12 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.50	ft
Diameter	1.00	ft

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.00240	0.83	2.11	0.39	1.57	1.00
0.00280	0.90	2.28	0.39	1.57	1.00
0.00320	0.96	2.44	0.39	1.57	1.00
0.00360	1.02	2.59	0.39	1.57	1.00
0.00400	1.07	2.73	0.39	1.57	1.00
0.00440	1.13	2.87	0.39	1.57	1.00
0.00480	1.18	3.00	0.39	1.57	1.00
0.00520	1.23	3.12	0.39	1.57	1.00
0.00560	1.27	3.24	0.39	1.57	1.00
0.00600	1.32	3.35	0.39	1.57	1.00
0.00640	1.36	3.46	0.39	1.57	1.00
0.00680	1.40	3.57	0.39	1.57	1.00
0.00720	1.44	3.68	0.39	1.57	1.00
0.00760	1.48	3.78	0.39	1.57	1.00
0.00800	1.52	3.88	0.39	1.57	1.00
0.00840	1.56	3.97	0.39	1.57	1.00
0.00880	1.60	4.07	0.39	1.57	1.00
0.00920	1.63	4.16	0.39	1.57	1.00
0.00960	1.67	4.25	0.39	1.57	1.00
0.01000	1.70	4.34	0.39	1.57	1.00
0.01040	1.74	4.42	0.39	1.57	1.00
0.01080	1.77	4.51	0.39	1.57	1.00
0.01120	1.80	4.59	0.39	1.57	1.00
0.01160	1.83	4.67	0.39	1.57	1.00
0.01200	1.87	4.75	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01240	1.90	4.83	0.39	1.57	1.00
0.01280	1.93	4.91	0.39	1.57	1.00
0.01320	1.96	4.98	0.39	1.57	1.00
0.01360	1.99	5.06	0.39	1.57	1.00
0.01400	2.02	5.13	0.39	1.57	1.00
0.01440	2.04	5.21	0.39	1.57	1.00
0.01480	2.07	5.28	0.39	1.57	1.00
0.01520	2.10	5.35	0.39	1.57	1.00
0.01560	2.13	5.42	0.39	1.57	1.00
0.01600	2.16	5.49	0.39	1.57	1.00
0.01640	2.18	5.56	0.39	1.57	1.00
0.01680	2.21	5.62	0.39	1.57	1.00
0.01720	2.23	5.69	0.39	1.57	1.00
0.01760	2.26	5.76	0.39	1.57	1.00
0.01800	2.29	5.82	0.39	1.57	1.00
0.01840	2.31	5.89	0.39	1.57	1.00
0.01880	2.34	5.95	0.39	1.57	1.00
0.01920	2.36	6.01	0.39	1.57	1.00
0.01960	2.39	6.08	0.39	1.57	1.00
0.02000	2.41	6.14	0.39	1.57	1.00
0.02040	2.43	6.20	0.39	1.57	1.00
0.02080	2.46	6.26	0.39	1.57	1.00
0.02120	2.48	6.32	0.39	1.57	1.00
0.02160	2.50	6.38	0.39	1.57	1.00
0.02200	2.53	6.44	0.39	1.57	1.00
0.02240	2.55	6.50	0.39	1.57	1.00
0.02280	2.57	6.55	0.39	1.57	1.00
0.02320	2.60	6.61	0.39	1.57	1.00
0.02360	2.62	6.67	0.39	1.57	1.00
0.02400	2.64	6.72	0.39	1.57	1.00
0.02440	2.66	6.78	0.39	1.57	1.00
0.02480	2.68	6.84	0.39	1.57	1.00
0.02520	2.71	6.89	0.39	1.57	1.00
0.02560	2.73	6.94	0.39	1.57	1.00
0.02600	2.75	7.00	0.39	1.57	1.00
0.02640	2.77	7.05	0.39	1.57	1.00
0.02680	2.79	7.11	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02720	2.81	7.16	0.39	1.57	1.00
0.02760	2.83	7.21	0.39	1.57	1.00
0.02800	2.85	7.26	0.39	1.57	1.00
0.02840	2.87	7.32	0.39	1.57	1.00
0.02880	2.89	7.37	0.39	1.57	1.00
0.02920	2.91	7.42	0.39	1.57	1.00
0.02960	2.93	7.47	0.39	1.57	1.00
0.03000	2.95	7.52	0.39	1.57	1.00
0.03040	2.97	7.57	0.39	1.57	1.00
0.03080	2.99	7.62	0.39	1.57	1.00
0.03120	3.01	7.67	0.39	1.57	1.00
0.03160	3.03	7.72	0.39	1.57	1.00
0.03200	3.05	7.77	0.39	1.57	1.00
0.03240	3.07	7.81	0.39	1.57	1.00
0.03280	3.09	7.86	0.39	1.57	1.00
0.03320	3.11	7.91	0.39	1.57	1.00
0.03360	3.13	7.96	0.39	1.57	1.00
0.03400	3.14	8.01	0.39	1.57	1.00
0.03440	3.16	8.05	0.39	1.57	1.00
0.03480	3.18	8.10	0.39	1.57	1.00
0.03520	3.20	8.15	0.39	1.57	1.00
0.03560	3.22	8.19	0.39	1.57	1.00
0.03600	3.23	8.24	0.39	1.57	1.00
0.03640	3.25	8.28	0.39	1.57	1.00
0.03680	3.27	8.33	0.39	1.57	1.00
0.03720	3.29	8.37	0.39	1.57	1.00
0.03760	3.31	8.42	0.39	1.57	1.00
0.03800	3.32	8.46	0.39	1.57	1.00
0.03840	3.34	8.51	0.39	1.57	1.00
0.03880	3.36	8.55	0.39	1.57	1.00
0.03920	3.38	8.60	0.39	1.57	1.00
0.03960	3.39	8.64	0.39	1.57	1.00
0.04000	3.41	8.68	0.39	1.57	1.00
0.04040	3.43	8.73	0.39	1.57	1.00
0.04080	3.44	8.77	0.39	1.57	1.00
0.04120	3.46	8.81	0.39	1.57	1.00
0.04160	3.48	8.86	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04200	3.49	8.90	0.39	1.57	1.00
0.04240	3.51	8.94	0.39	1.57	1.00
0.04280	3.53	8.98	0.39	1.57	1.00
0.04320	3.54	9.02	0.39	1.57	1.00
0.04360	3.56	9.07	0.39	1.57	1.00
0.04400	3.58	9.11	0.39	1.57	1.00
0.04440	3.59	9.15	0.39	1.57	1.00
0.04480	3.61	9.19	0.39	1.57	1.00
0.04520	3.63	9.23	0.39	1.57	1.00
0.04560	3.64	9.27	0.39	1.57	1.00
0.04600	3.66	9.31	0.39	1.57	1.00
0.04640	3.67	9.35	0.39	1.57	1.00
0.04680	3.69	9.39	0.39	1.57	1.00
0.04720	3.70	9.43	0.39	1.57	1.00
0.04760	3.72	9.47	0.39	1.57	1.00
0.04800	3.74	9.51	0.39	1.57	1.00
0.04840	3.75	9.55	0.39	1.57	1.00
0.04880	3.77	9.59	0.39	1.57	1.00
0.04920	3.78	9.63	0.39	1.57	1.00
0.04960	3.80	9.67	0.39	1.57	1.00
0.05000	3.81	9.71	0.39	1.57	1.00
0.05040	3.83	9.75	0.39	1.57	1.00
0.05080	3.84	9.79	0.39	1.57	1.00
0.05120	3.86	9.83	0.39	1.57	1.00
0.05160	3.87	9.86	0.39	1.57	1.00
0.05200	3.89	9.90	0.39	1.57	1.00
0.05240	3.90	9.94	0.39	1.57	1.00
0.05280	3.92	9.98	0.39	1.57	1.00
0.05320	3.93	10.02	0.39	1.57	1.00
0.05360	3.95	10.05	0.39	1.57	1.00
0.05400	3.96	10.09	0.39	1.57	1.00
0.05440	3.98	10.13	0.39	1.57	1.00
0.05480	3.99	10.17	0.39	1.57	1.00
0.05520	4.01	10.20	0.39	1.57	1.00
0.05560	4.02	10.24	0.39	1.57	1.00
0.05600	4.04	10.28	0.39	1.57	1.00
0.05640	4.05	10.31	0.39	1.57	1.00

Rating Table for 12 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.05680	4.06	10.35	0.39	1.57	1.00
0.05720	4.08	10.39	0.39	1.57	1.00
0.05760	4.09	10.42	0.39	1.57	1.00
0.05800	4.11	10.46	0.39	1.57	1.00
0.05840	4.12	10.49	0.39	1.57	1.00
0.05880	4.14	10.53	0.39	1.57	1.00
0.05920	4.15	10.57	0.39	1.57	1.00
0.05960	4.16	10.60	0.39	1.57	1.00
0.06000	4.18	10.64	0.39	1.57	1.00

Rating Table for 15 VCP

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.00400	ft/ft
Normal Depth	0.63	ft
Diameter	1.25	ft

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.00400	1.99	3.24	0.61	1.96	1.25
0.00440	2.08	3.40	0.61	1.96	1.25
0.00480	2.18	3.55	0.61	1.96	1.25
0.00520	2.27	3.69	0.61	1.96	1.25
0.00560	2.35	3.83	0.61	1.96	1.25
0.00600	2.44	3.97	0.61	1.96	1.25
0.00640	2.52	4.10	0.61	1.96	1.25
0.00680	2.59	4.23	0.61	1.96	1.25
0.00720	2.67	4.35	0.61	1.96	1.25
0.00760	2.74	4.47	0.61	1.96	1.25
0.00800	2.81	4.59	0.61	1.96	1.25
0.00840	2.88	4.70	0.61	1.96	1.25
0.00880	2.95	4.81	0.61	1.96	1.25
0.00920	3.02	4.92	0.61	1.96	1.25
0.00960	3.08	5.03	0.61	1.96	1.25
0.01000	3.15	5.13	0.61	1.96	1.25
0.01040	3.21	5.23	0.61	1.96	1.25
0.01080	3.27	5.33	0.61	1.96	1.25
0.01120	3.33	5.43	0.61	1.96	1.25
0.01160	3.39	5.53	0.61	1.96	1.25
0.01200	3.45	5.62	0.61	1.96	1.25
0.01240	3.51	5.71	0.61	1.96	1.25
0.01280	3.56	5.81	0.61	1.96	1.25
0.01320	3.62	5.90	0.61	1.96	1.25
0.01360	3.67	5.98	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01400	3.73	6.07	0.61	1.96	1.25
0.01440	3.78	6.16	0.61	1.96	1.25
0.01480	3.83	6.24	0.61	1.96	1.25
0.01520	3.88	6.33	0.61	1.96	1.25
0.01560	3.93	6.41	0.61	1.96	1.25
0.01600	3.98	6.49	0.61	1.96	1.25
0.01640	4.03	6.57	0.61	1.96	1.25
0.01680	4.08	6.65	0.61	1.96	1.25
0.01720	4.13	6.73	0.61	1.96	1.25
0.01760	4.18	6.81	0.61	1.96	1.25
0.01800	4.23	6.89	0.61	1.96	1.25
0.01840	4.27	6.96	0.61	1.96	1.25
0.01880	4.32	7.04	0.61	1.96	1.25
0.01920	4.36	7.11	0.61	1.96	1.25
0.01960	4.41	7.19	0.61	1.96	1.25
0.02000	4.46	7.26	0.61	1.96	1.25
0.02040	4.50	7.33	0.61	1.96	1.25
0.02080	4.54	7.40	0.61	1.96	1.25
0.02120	4.59	7.48	0.61	1.96	1.25
0.02160	4.63	7.55	0.61	1.96	1.25
0.02200	4.67	7.62	0.61	1.96	1.25
0.02240	4.72	7.68	0.61	1.96	1.25
0.02280	4.76	7.75	0.61	1.96	1.25
0.02320	4.80	7.82	0.61	1.96	1.25
0.02360	4.84	7.89	0.61	1.96	1.25
0.02400	4.88	7.95	0.61	1.96	1.25
0.02440	4.92	8.02	0.61	1.96	1.25
0.02480	4.96	8.09	0.61	1.96	1.25
0.02520	5.00	8.15	0.61	1.96	1.25
0.02560	5.04	8.22	0.61	1.96	1.25
0.02600	5.08	8.28	0.61	1.96	1.25
0.02640	5.12	8.34	0.61	1.96	1.25
0.02680	5.16	8.41	0.61	1.96	1.25
0.02720	5.20	8.47	0.61	1.96	1.25
0.02760	5.23	8.53	0.61	1.96	1.25
0.02800	5.27	8.59	0.61	1.96	1.25
0.02840	5.31	8.65	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.02880	5.35	8.72	0.61	1.96	1.25
0.02920	5.38	8.78	0.61	1.96	1.25
0.02960	5.42	8.84	0.61	1.96	1.25
0.03000	5.46	8.90	0.61	1.96	1.25
0.03040	5.49	8.95	0.61	1.96	1.25
0.03080	5.53	9.01	0.61	1.96	1.25
0.03120	5.57	9.07	0.61	1.96	1.25
0.03160	5.60	9.13	0.61	1.96	1.25
0.03200	5.64	9.19	0.61	1.96	1.25
0.03240	5.67	9.24	0.61	1.96	1.25
0.03280	5.71	9.30	0.61	1.96	1.25
0.03320	5.74	9.36	0.61	1.96	1.25
0.03360	5.78	9.41	0.61	1.96	1.25
0.03400	5.81	9.47	0.61	1.96	1.25
0.03440	5.85	9.53	0.61	1.96	1.25
0.03480	5.88	9.58	0.61	1.96	1.25
0.03520	5.91	9.64	0.61	1.96	1.25
0.03560	5.95	9.69	0.61	1.96	1.25
0.03600	5.98	9.75	0.61	1.96	1.25
0.03640	6.01	9.80	0.61	1.96	1.25
0.03680	6.05	9.85	0.61	1.96	1.25
0.03720	6.08	9.91	0.61	1.96	1.25
0.03760	6.11	9.96	0.61	1.96	1.25
0.03800	6.14	10.01	0.61	1.96	1.25
0.03840	6.18	10.07	0.61	1.96	1.25
0.03880	6.21	10.12	0.61	1.96	1.25
0.03920	6.24	10.17	0.61	1.96	1.25
0.03960	6.27	10.22	0.61	1.96	1.25
0.04000	6.30	10.27	0.61	1.96	1.25
0.04040	6.33	10.32	0.61	1.96	1.25
0.04080	6.37	10.38	0.61	1.96	1.25
0.04120	6.40	10.43	0.61	1.96	1.25
0.04160	6.43	10.48	0.61	1.96	1.25
0.04200	6.46	10.53	0.61	1.96	1.25
0.04240	6.49	10.58	0.61	1.96	1.25
0.04280	6.52	10.63	0.61	1.96	1.25
0.04320	6.55	10.68	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.04360	6.58	10.73	0.61	1.96	1.25
0.04400	6.61	10.77	0.61	1.96	1.25
0.04440	6.64	10.82	0.61	1.96	1.25
0.04480	6.67	10.87	0.61	1.96	1.25
0.04520	6.70	10.92	0.61	1.96	1.25
0.04560	6.73	10.97	0.61	1.96	1.25
0.04600	6.76	11.02	0.61	1.96	1.25
0.04640	6.79	11.06	0.61	1.96	1.25
0.04680	6.82	11.11	0.61	1.96	1.25
0.04720	6.85	11.16	0.61	1.96	1.25
0.04760	6.88	11.21	0.61	1.96	1.25
0.04800	6.91	11.25	0.61	1.96	1.25
0.04840	6.93	11.30	0.61	1.96	1.25
0.04880	6.96	11.35	0.61	1.96	1.25
0.04920	6.99	11.39	0.61	1.96	1.25
0.04960	7.02	11.44	0.61	1.96	1.25
0.05000	7.05	11.49	0.61	1.96	1.25
0.05040	7.08	11.53	0.61	1.96	1.25
0.05080	7.10	11.58	0.61	1.96	1.25
0.05120	7.13	11.62	0.61	1.96	1.25
0.05160	7.16	11.67	0.61	1.96	1.25
0.05200	7.19	11.71	0.61	1.96	1.25
0.05240	7.22	11.76	0.61	1.96	1.25
0.05280	7.24	11.80	0.61	1.96	1.25
0.05320	7.27	11.85	0.61	1.96	1.25
0.05360	7.30	11.89	0.61	1.96	1.25
0.05400	7.32	11.94	0.61	1.96	1.25
0.05440	7.35	11.98	0.61	1.96	1.25
0.05480	7.38	12.03	0.61	1.96	1.25
0.05520	7.41	12.07	0.61	1.96	1.25
0.05560	7.43	12.11	0.61	1.96	1.25
0.05600	7.46	12.16	0.61	1.96	1.25
0.05640	7.49	12.20	0.61	1.96	1.25
0.05680	7.51	12.24	0.61	1.96	1.25
0.05720	7.54	12.29	0.61	1.96	1.25
0.05760	7.56	12.33	0.61	1.96	1.25
0.05800	7.59	12.37	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.05840	7.62	12.41	0.61	1.96	1.25
0.05880	7.64	12.46	0.61	1.96	1.25
0.05920	7.67	12.50	0.61	1.96	1.25
0.05960	7.70	12.54	0.61	1.96	1.25
0.06000	7.72	12.58	0.61	1.96	1.25
0.06040	7.75	12.63	0.61	1.96	1.25
0.06080	7.77	12.67	0.61	1.96	1.25
0.06120	7.80	12.71	0.61	1.96	1.25
0.06160	7.82	12.75	0.61	1.96	1.25
0.06200	7.85	12.79	0.61	1.96	1.25
0.06240	7.87	12.83	0.61	1.96	1.25
0.06280	7.90	12.87	0.61	1.96	1.25
0.06320	7.92	12.91	0.61	1.96	1.25
0.06360	7.95	12.96	0.61	1.96	1.25
0.06400	7.97	13.00	0.61	1.96	1.25
0.06440	8.00	13.04	0.61	1.96	1.25
0.06480	8.02	13.08	0.61	1.96	1.25
0.06520	8.05	13.12	0.61	1.96	1.25
0.06560	8.07	13.16	0.61	1.96	1.25
0.06600	8.10	13.20	0.61	1.96	1.25
0.06640	8.12	13.24	0.61	1.96	1.25
0.06680	8.15	13.28	0.61	1.96	1.25
0.06720	8.17	13.32	0.61	1.96	1.25
0.06760	8.20	13.36	0.61	1.96	1.25
0.06800	8.22	13.40	0.61	1.96	1.25
0.06840	8.24	13.44	0.61	1.96	1.25
0.06880	8.27	13.48	0.61	1.96	1.25
0.06920	8.29	13.51	0.61	1.96	1.25
0.06960	8.32	13.55	0.61	1.96	1.25
0.07000	8.34	13.59	0.61	1.96	1.25
0.07040	8.36	13.63	0.61	1.96	1.25
0.07080	8.39	13.67	0.61	1.96	1.25
0.07120	8.41	13.71	0.61	1.96	1.25
0.07160	8.43	13.75	0.61	1.96	1.25
0.07200	8.46	13.79	0.61	1.96	1.25
0.07240	8.48	13.82	0.61	1.96	1.25
0.07280	8.51	13.86	0.61	1.96	1.25

Rating Table for 15 VCP

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.07320	8.53	13.90	0.61	1.96	1.25
0.07360	8.55	13.94	0.61	1.96	1.25
0.07400	8.58	13.98	0.61	1.96	1.25
0.07440	8.60	14.01	0.61	1.96	1.25
0.07480	8.62	14.05	0.61	1.96	1.25
0.07520	8.64	14.09	0.61	1.96	1.25
0.07560	8.67	14.13	0.61	1.96	1.25
0.07600	8.69	14.16	0.61	1.96	1.25
0.07640	8.71	14.20	0.61	1.96	1.25
0.07680	8.74	14.24	0.61	1.96	1.25
0.07720	8.76	14.27	0.61	1.96	1.25
0.07760	8.78	14.31	0.61	1.96	1.25
0.07800	8.80	14.35	0.61	1.96	1.25
0.07840	8.83	14.39	0.61	1.96	1.25
0.07880	8.85	14.42	0.61	1.96	1.25
0.07920	8.87	14.46	0.61	1.96	1.25
0.07960	8.89	14.49	0.61	1.96	1.25
0.08000	8.92	14.53	0.61	1.96	1.25

Rating Table for 15 inch - 3/4 Full

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.0040 ft/ft
Normal Depth	11.25 in
Diameter	15.0 in

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0008	1.62	1.64	1.0	2.6	1.08
0.0012	1.99	2.02	1.0	2.6	1.08
0.0016	2.31	2.34	1.0	2.6	1.08
0.0020	2.59	2.62	1.0	2.6	1.08
0.0024	2.84	2.87	1.0	2.6	1.08
0.0028	3.07	3.11	1.0	2.6	1.08
0.0032	3.28	3.32	1.0	2.6	1.08
0.0036	3.48	3.53	1.0	2.6	1.08
0.0040	3.67	3.72	1.0	2.6	1.08
0.0044	3.85	3.90	1.0	2.6	1.08
0.0048	4.03	4.08	1.0	2.6	1.08
0.0052	4.19	4.25	1.0	2.6	1.08
0.0056	4.35	4.41	1.0	2.6	1.08
0.0060	4.50	4.56	1.0	2.6	1.08
0.0064	4.65	4.71	1.0	2.6	1.08
0.0068	4.80	4.86	1.0	2.6	1.08
0.0072	4.94	5.00	1.0	2.6	1.08
0.0076	5.07	5.14	1.0	2.6	1.08
0.0080	5.20	5.27	1.0	2.6	1.08
0.0084	5.33	5.40	1.0	2.6	1.08
0.0088	5.46	5.53	1.0	2.6	1.08
0.0092	5.58	5.65	1.0	2.6	1.08
0.0096	5.70	5.78	1.0	2.6	1.08
0.0100	5.82	5.90	1.0	2.6	1.08
0.0104	5.94	6.01	1.0	2.6	1.08
0.0108	6.05	6.13	1.0	2.6	1.08
0.0112	6.16	6.24	1.0	2.6	1.08
0.0116	6.27	6.35	1.0	2.6	1.08
0.0120	6.38	6.46	1.0	2.6	1.08
0.0124	6.48	6.57	1.0	2.6	1.08
0.0128	6.59	6.67	1.0	2.6	1.08
0.0132	6.69	6.78	1.0	2.6	1.08
0.0136	6.79	6.88	1.0	2.6	1.08
0.0140	6.89	6.98	1.0	2.6	1.08
0.0144	6.99	7.08	1.0	2.6	1.08
0.0148	7.09	7.18	1.0	2.6	1.08
0.0152	7.18	7.27	1.0	2.6	1.08
0.0156	7.27	7.37	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0160	7.37	7.46	1.0	2.6	1.08
0.0164	7.46	7.56	1.0	2.6	1.08
0.0168	7.55	7.65	1.0	2.6	1.08
0.0172	7.64	7.74	1.0	2.6	1.08
0.0176	7.73	7.83	1.0	2.6	1.08
0.0180	7.82	7.92	1.0	2.6	1.08
0.0184	7.90	8.00	1.0	2.6	1.08
0.0188	7.99	8.09	1.0	2.6	1.08
0.0192	8.07	8.18	1.0	2.6	1.08
0.0196	8.16	8.26	1.0	2.6	1.08
0.0200	8.24	8.34	1.0	2.6	1.08
0.0204	8.32	8.43	1.0	2.6	1.08
0.0208	8.40	8.51	1.0	2.6	1.08
0.0212	8.48	8.59	1.0	2.6	1.08
0.0216	8.56	8.67	1.0	2.6	1.08
0.0220	8.64	8.75	1.0	2.6	1.08
0.0224	8.72	8.83	1.0	2.6	1.08
0.0228	8.80	8.91	1.0	2.6	1.08
0.0232	8.87	8.99	1.0	2.6	1.08
0.0236	8.95	9.07	1.0	2.6	1.08
0.0240	9.03	9.14	1.0	2.6	1.08
0.0244	9.10	9.22	1.0	2.6	1.08
0.0248	9.18	9.29	1.0	2.6	1.08
0.0252	9.25	9.37	1.0	2.6	1.08
0.0256	9.32	9.44	1.0	2.6	1.08
0.0260	9.40	9.52	1.0	2.6	1.08
0.0264	9.47	9.59	1.0	2.6	1.08
0.0268	9.54	9.66	1.0	2.6	1.08
0.0272	9.61	9.73	1.0	2.6	1.08
0.0276	9.68	9.81	1.0	2.6	1.08
0.0280	9.75	9.88	1.0	2.6	1.08
0.0284	9.82	9.95	1.0	2.6	1.08
0.0288	9.89	10.02	1.0	2.6	1.08
0.0292	9.96	10.09	1.0	2.6	1.08
0.0296	10.03	10.15	1.0	2.6	1.08
0.0300	10.09	10.22	1.0	2.6	1.08
0.0304	10.16	10.29	1.0	2.6	1.08
0.0308	10.23	10.36	1.0	2.6	1.08
0.0312	10.29	10.43	1.0	2.6	1.08
0.0316	10.36	10.49	1.0	2.6	1.08
0.0320	10.42	10.56	1.0	2.6	1.08
0.0324	10.49	10.62	1.0	2.6	1.08
0.0328	10.55	10.69	1.0	2.6	1.08
0.0332	10.62	10.76	1.0	2.6	1.08
0.0336	10.68	10.82	1.0	2.6	1.08
0.0340	10.75	10.88	1.0	2.6	1.08
0.0344	10.81	10.95	1.0	2.6	1.08
0.0348	10.87	11.01	1.0	2.6	1.08
0.0352	10.93	11.07	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0356	11.00	11.14	1.0	2.6	1.08
0.0360	11.06	11.20	1.0	2.6	1.08
0.0364	11.12	11.26	1.0	2.6	1.08
0.0368	11.18	11.32	1.0	2.6	1.08
0.0372	11.24	11.39	1.0	2.6	1.08
0.0376	11.30	11.45	1.0	2.6	1.08
0.0380	11.36	11.51	1.0	2.6	1.08
0.0384	11.42	11.57	1.0	2.6	1.08
0.0388	11.48	11.63	1.0	2.6	1.08
0.0392	11.54	11.69	1.0	2.6	1.08
0.0396	11.60	11.75	1.0	2.6	1.08
0.0400	11.66	11.81	1.0	2.6	1.08
0.0404	11.71	11.87	1.0	2.6	1.08
0.0408	11.77	11.92	1.0	2.6	1.08
0.0412	11.83	11.98	1.0	2.6	1.08
0.0416	11.89	12.04	1.0	2.6	1.08
0.0420	11.94	12.10	1.0	2.6	1.08
0.0424	12.00	12.16	1.0	2.6	1.08
0.0428	12.06	12.21	1.0	2.6	1.08
0.0432	12.11	12.27	1.0	2.6	1.08
0.0436	12.17	12.33	1.0	2.6	1.08
0.0440	12.23	12.38	1.0	2.6	1.08
0.0444	12.28	12.44	1.0	2.6	1.08
0.0448	12.34	12.50	1.0	2.6	1.08
0.0452	12.39	12.55	1.0	2.6	1.08
0.0456	12.45	12.61	1.0	2.6	1.08
0.0460	12.50	12.66	1.0	2.6	1.08
0.0464	12.55	12.72	1.0	2.6	1.08
0.0468	12.61	12.77	1.0	2.6	1.08
0.0472	12.66	12.83	1.0	2.6	1.08
0.0476	12.72	12.88	1.0	2.6	1.08
0.0480	12.77	12.93	1.0	2.6	1.08
0.0484	12.82	12.99	1.0	2.6	1.08
0.0488	12.88	13.04	1.0	2.6	1.08
0.0492	12.93	13.09	1.0	2.6	1.08
0.0496	12.98	13.15	1.0	2.6	1.08
0.0500	13.03	13.20	1.0	2.6	1.08
0.0504	13.08	13.25	1.0	2.6	1.08
0.0508	13.14	13.31	1.0	2.6	1.08
0.0512	13.19	13.36	1.0	2.6	1.08
0.0516	13.24	13.41	1.0	2.6	1.08
0.0520	13.29	13.46	1.0	2.6	1.08
0.0524	13.34	13.51	1.0	2.6	1.08
0.0528	13.39	13.57	1.0	2.6	1.08
0.0532	13.44	13.62	1.0	2.6	1.08
0.0536	13.49	13.67	1.0	2.6	1.08
0.0540	13.54	13.72	1.0	2.6	1.08
0.0544	13.59	13.77	1.0	2.6	1.08
0.0548	13.64	13.82	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0552	13.69	13.87	1.0	2.6	1.08
0.0556	13.74	13.92	1.0	2.6	1.08
0.0560	13.79	13.97	1.0	2.6	1.08
0.0564	13.84	14.02	1.0	2.6	1.08
0.0568	13.89	14.07	1.0	2.6	1.08
0.0572	13.94	14.12	1.0	2.6	1.08
0.0576	13.99	14.17	1.0	2.6	1.08
0.0580	14.04	14.22	1.0	2.6	1.08
0.0584	14.09	14.27	1.0	2.6	1.08
0.0588	14.13	14.32	1.0	2.6	1.08
0.0592	14.18	14.36	1.0	2.6	1.08
0.0596	14.23	14.41	1.0	2.6	1.08
0.0600	14.28	14.46	1.0	2.6	1.08
0.0604	14.33	14.51	1.0	2.6	1.08
0.0608	14.37	14.56	1.0	2.6	1.08
0.0612	14.42	14.61	1.0	2.6	1.08
0.0616	14.47	14.65	1.0	2.6	1.08
0.0620	14.51	14.70	1.0	2.6	1.08
0.0624	14.56	14.75	1.0	2.6	1.08
0.0628	14.61	14.80	1.0	2.6	1.08
0.0632	14.65	14.84	1.0	2.6	1.08
0.0636	14.70	14.89	1.0	2.6	1.08
0.0640	14.75	14.94	1.0	2.6	1.08
0.0644	14.79	14.98	1.0	2.6	1.08
0.0648	14.84	15.03	1.0	2.6	1.08
0.0652	14.88	15.08	1.0	2.6	1.08
0.0656	14.93	15.12	1.0	2.6	1.08
0.0660	14.97	15.17	1.0	2.6	1.08
0.0664	15.02	15.21	1.0	2.6	1.08
0.0668	15.07	15.26	1.0	2.6	1.08
0.0672	15.11	15.31	1.0	2.6	1.08
0.0676	15.16	15.35	1.0	2.6	1.08
0.0680	15.20	15.40	1.0	2.6	1.08
0.0684	15.24	15.44	1.0	2.6	1.08
0.0688	15.29	15.49	1.0	2.6	1.08
0.0692	15.33	15.53	1.0	2.6	1.08
0.0696	15.38	15.58	1.0	2.6	1.08
0.0700	15.42	15.62	1.0	2.6	1.08
0.0704	15.47	15.67	1.0	2.6	1.08
0.0708	15.51	15.71	1.0	2.6	1.08
0.0712	15.55	15.75	1.0	2.6	1.08
0.0716	15.60	15.80	1.0	2.6	1.08
0.0720	15.64	15.84	1.0	2.6	1.08
0.0724	15.68	15.89	1.0	2.6	1.08
0.0728	15.73	15.93	1.0	2.6	1.08
0.0732	15.77	15.97	1.0	2.6	1.08
0.0736	15.81	16.02	1.0	2.6	1.08
0.0740	15.86	16.06	1.0	2.6	1.08
0.0744	15.90	16.10	1.0	2.6	1.08

Rating Table for 15 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0748	15.94	16.15	1.0	2.6	1.08
0.0752	15.98	16.19	1.0	2.6	1.08
0.0756	16.03	16.23	1.0	2.6	1.08
0.0760	16.07	16.28	1.0	2.6	1.08
0.0764	16.11	16.32	1.0	2.6	1.08
0.0768	16.15	16.36	1.0	2.6	1.08
0.0772	16.20	16.41	1.0	2.6	1.08
0.0776	16.24	16.45	1.0	2.6	1.08
0.0780	16.28	16.49	1.0	2.6	1.08
0.0784	16.32	16.53	1.0	2.6	1.08
0.0788	16.36	16.57	1.0	2.6	1.08
0.0792	16.40	16.62	1.0	2.6	1.08
0.0796	16.45	16.66	1.0	2.6	1.08
0.0800	16.49	16.70	1.0	2.6	1.08

Rating Table for 18 inch

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013	
Channel Slope	0.01000	ft/ft
Normal Depth	0.75	ft
Diameter	1.50	ft

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.00140	1.92	2.18	0.88	2.36	1.50
0.00180	2.19	2.47	0.88	2.36	1.50
0.00220	2.42	2.74	0.88	2.36	1.50
0.00260	2.63	2.98	0.88	2.36	1.50
0.00300	2.83	3.20	0.88	2.36	1.50
0.00340	3.02	3.41	0.88	2.36	1.50
0.00380	3.19	3.61	0.88	2.36	1.50
0.00420	3.35	3.80	0.88	2.36	1.50
0.00460	3.51	3.97	0.88	2.36	1.50
0.00500	3.66	4.15	0.88	2.36	1.50
0.00540	3.81	4.31	0.88	2.36	1.50
0.00580	3.95	4.47	0.88	2.36	1.50
0.00620	4.08	4.62	0.88	2.36	1.50
0.00660	4.21	4.77	0.88	2.36	1.50
0.00700	4.34	4.91	0.88	2.36	1.50
0.00740	4.46	5.05	0.88	2.36	1.50
0.00780	4.58	5.18	0.88	2.36	1.50
0.00820	4.70	5.32	0.88	2.36	1.50
0.00860	4.81	5.44	0.88	2.36	1.50
0.00900	4.92	5.57	0.88	2.36	1.50
0.00940	5.03	5.69	0.88	2.36	1.50
0.00980	5.14	5.81	0.88	2.36	1.50
0.01020	5.24	5.93	0.88	2.36	1.50
0.01060	5.34	6.05	0.88	2.36	1.50
0.01100	5.44	6.16	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft³/s)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.01140	5.54	6.27	0.88	2.36	1.50
0.01180	5.64	6.38	0.88	2.36	1.50
0.01220	5.73	6.49	0.88	2.36	1.50
0.01260	5.83	6.59	0.88	2.36	1.50
0.01300	5.92	6.70	0.88	2.36	1.50
0.01340	6.01	6.80	0.88	2.36	1.50
0.01380	6.10	6.90	0.88	2.36	1.50
0.01420	6.19	7.00	0.88	2.36	1.50
0.01460	6.27	7.10	0.88	2.36	1.50
0.01500	6.36	7.20	0.88	2.36	1.50
0.01540	6.44	7.29	0.88	2.36	1.50
0.01580	6.53	7.39	0.88	2.36	1.50
0.01620	6.61	7.48	0.88	2.36	1.50
0.01660	6.69	7.57	0.88	2.36	1.50
0.01700	6.77	7.66	0.88	2.36	1.50
0.01740	6.85	7.75	0.88	2.36	1.50
0.01780	6.93	7.84	0.88	2.36	1.50
0.01820	7.00	7.93	0.88	2.36	1.50
0.01860	7.08	8.01	0.88	2.36	1.50
0.01900	7.16	8.10	0.88	2.36	1.50
0.01940	7.23	8.18	0.88	2.36	1.50
0.01980	7.31	8.27	0.88	2.36	1.50
0.02020	7.38	8.35	0.88	2.36	1.50
0.02060	7.45	8.43	0.88	2.36	1.50
0.02100	7.52	8.52	0.88	2.36	1.50
0.02140	7.60	8.60	0.88	2.36	1.50
0.02180	7.67	8.68	0.88	2.36	1.50
0.02220	7.74	8.76	0.88	2.36	1.50
0.02260	7.81	8.84	0.88	2.36	1.50
0.02300	7.88	8.91	0.88	2.36	1.50
0.02340	7.94	8.99	0.88	2.36	1.50
0.02380	8.01	9.07	0.88	2.36	1.50
0.02420	8.08	9.14	0.88	2.36	1.50
0.02460	8.15	9.22	0.88	2.36	1.50
0.02500	8.21	9.29	0.88	2.36	1.50
0.02540	8.28	9.37	0.88	2.36	1.50
0.02580	8.34	9.44	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.02620	8.41	9.51	0.88	2.36	1.50
0.02660	8.47	9.59	0.88	2.36	1.50
0.02700	8.53	9.66	0.88	2.36	1.50
0.02740	8.60	9.73	0.88	2.36	1.50
0.02780	8.66	9.80	0.88	2.36	1.50
0.02820	8.72	9.87	0.88	2.36	1.50
0.02860	8.78	9.94	0.88	2.36	1.50
0.02900	8.84	10.01	0.88	2.36	1.50
0.02940	8.91	10.08	0.88	2.36	1.50
0.02980	8.97	10.15	0.88	2.36	1.50
0.03020	9.03	10.22	0.88	2.36	1.50
0.03060	9.09	10.28	0.88	2.36	1.50
0.03100	9.14	10.35	0.88	2.36	1.50
0.03140	9.20	10.42	0.88	2.36	1.50
0.03180	9.26	10.48	0.88	2.36	1.50
0.03220	9.32	10.55	0.88	2.36	1.50
0.03260	9.38	10.61	0.88	2.36	1.50
0.03300	9.44	10.68	0.88	2.36	1.50
0.03340	9.49	10.74	0.88	2.36	1.50
0.03380	9.55	10.81	0.88	2.36	1.50
0.03420	9.61	10.87	0.88	2.36	1.50
0.03460	9.66	10.93	0.88	2.36	1.50
0.03500	9.72	11.00	0.88	2.36	1.50
0.03540	9.77	11.06	0.88	2.36	1.50
0.03580	9.83	11.12	0.88	2.36	1.50
0.03620	9.88	11.18	0.88	2.36	1.50
0.03660	9.94	11.25	0.88	2.36	1.50
0.03700	9.99	11.31	0.88	2.36	1.50
0.03740	10.05	11.37	0.88	2.36	1.50
0.03780	10.10	11.43	0.88	2.36	1.50
0.03820	10.15	11.49	0.88	2.36	1.50
0.03860	10.21	11.55	0.88	2.36	1.50
0.03900	10.26	11.61	0.88	2.36	1.50
0.03940	10.31	11.67	0.88	2.36	1.50
0.03980	10.36	11.73	0.88	2.36	1.50
0.04020	10.41	11.79	0.88	2.36	1.50
0.04060	10.47	11.85	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.04100	10.52	11.90	0.88	2.36	1.50
0.04140	10.57	11.96	0.88	2.36	1.50
0.04180	10.62	12.02	0.88	2.36	1.50
0.04220	10.67	12.08	0.88	2.36	1.50
0.04260	10.72	12.13	0.88	2.36	1.50
0.04300	10.77	12.19	0.88	2.36	1.50
0.04340	10.82	12.25	0.88	2.36	1.50
0.04380	10.87	12.30	0.88	2.36	1.50
0.04420	10.92	12.36	0.88	2.36	1.50
0.04460	10.97	12.42	0.88	2.36	1.50
0.04500	11.02	12.47	0.88	2.36	1.50
0.04540	11.07	12.53	0.88	2.36	1.50
0.04580	11.12	12.58	0.88	2.36	1.50
0.04620	11.17	12.64	0.88	2.36	1.50
0.04660	11.21	12.69	0.88	2.36	1.50
0.04700	11.26	12.75	0.88	2.36	1.50
0.04740	11.31	12.80	0.88	2.36	1.50
0.04780	11.36	12.85	0.88	2.36	1.50
0.04820	11.40	12.91	0.88	2.36	1.50
0.04860	11.45	12.96	0.88	2.36	1.50
0.04900	11.50	13.01	0.88	2.36	1.50
0.04940	11.55	13.07	0.88	2.36	1.50
0.04980	11.59	13.12	0.88	2.36	1.50
0.05020	11.64	13.17	0.88	2.36	1.50
0.05060	11.69	13.23	0.88	2.36	1.50
0.05100	11.73	13.28	0.88	2.36	1.50
0.05140	11.78	13.33	0.88	2.36	1.50
0.05180	11.82	13.38	0.88	2.36	1.50
0.05220	11.87	13.43	0.88	2.36	1.50
0.05260	11.91	13.48	0.88	2.36	1.50
0.05300	11.96	13.54	0.88	2.36	1.50
0.05340	12.00	13.59	0.88	2.36	1.50
0.05380	12.05	13.64	0.88	2.36	1.50
0.05420	12.09	13.69	0.88	2.36	1.50
0.05460	12.14	13.74	0.88	2.36	1.50
0.05500	12.18	13.79	0.88	2.36	1.50
0.05540	12.23	13.84	0.88	2.36	1.50

Rating Table for 18 inch

Input Data

Channel Slope (ft/ft)	Discharge (ft^3/s)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.05580	12.27	13.89	0.88	2.36	1.50
0.05620	12.32	13.94	0.88	2.36	1.50
0.05660	12.36	13.99	0.88	2.36	1.50
0.05700	12.40	14.04	0.88	2.36	1.50
0.05740	12.45	14.09	0.88	2.36	1.50
0.05780	12.49	14.14	0.88	2.36	1.50
0.05820	12.53	14.18	0.88	2.36	1.50
0.05860	12.58	14.23	0.88	2.36	1.50
0.05900	12.62	14.28	0.88	2.36	1.50
0.05940	12.66	14.33	0.88	2.36	1.50
0.05980	12.70	14.38	0.88	2.36	1.50

Rating Table for 18 inch - 3/4 Full

Project Description

Friction Method	Kutter Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.013
Channel Slope	0.0040 ft/ft
Normal Depth	13.50 in
Diameter	18.0 in

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0008	2.66	1.87	1.4	3.1	1.30
0.0012	3.28	2.31	1.4	3.1	1.30
0.0016	3.80	2.67	1.4	3.1	1.30
0.0020	4.26	2.99	1.4	3.1	1.30
0.0024	4.67	3.28	1.4	3.1	1.30
0.0028	5.05	3.55	1.4	3.1	1.30
0.0032	5.40	3.80	1.4	3.1	1.30
0.0036	5.73	4.03	1.4	3.1	1.30
0.0040	6.04	4.25	1.4	3.1	1.30
0.0044	6.34	4.46	1.4	3.1	1.30
0.0048	6.62	4.66	1.4	3.1	1.30
0.0052	6.90	4.85	1.4	3.1	1.30
0.0056	7.16	5.03	1.4	3.1	1.30
0.0060	7.41	5.21	1.4	3.1	1.30
0.0064	7.65	5.38	1.4	3.1	1.30
0.0068	7.89	5.55	1.4	3.1	1.30
0.0072	8.12	5.71	1.4	3.1	1.30
0.0076	8.34	5.87	1.4	3.1	1.30
0.0080	8.56	6.02	1.4	3.1	1.30
0.0084	8.77	6.17	1.4	3.1	1.30
0.0088	8.98	6.32	1.4	3.1	1.30
0.0092	9.18	6.46	1.4	3.1	1.30
0.0096	9.38	6.60	1.4	3.1	1.30
0.0100	9.57	6.73	1.4	3.1	1.30
0.0104	9.76	6.87	1.4	3.1	1.30
0.0108	9.95	7.00	1.4	3.1	1.30
0.0112	10.13	7.13	1.4	3.1	1.30
0.0116	10.31	7.25	1.4	3.1	1.30
0.0120	10.49	7.38	1.4	3.1	1.30
0.0124	10.66	7.50	1.4	3.1	1.30
0.0128	10.84	7.62	1.4	3.1	1.30
0.0132	11.00	7.74	1.4	3.1	1.30
0.0136	11.17	7.86	1.4	3.1	1.30
0.0140	11.33	7.97	1.4	3.1	1.30
0.0144	11.49	8.09	1.4	3.1	1.30
0.0148	11.65	8.20	1.4	3.1	1.30
0.0152	11.81	8.31	1.4	3.1	1.30
0.0156	11.96	8.42	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0160	12.12	8.52	1.4	3.1	1.30
0.0164	12.27	8.63	1.4	3.1	1.30
0.0168	12.42	8.73	1.4	3.1	1.30
0.0172	12.56	8.84	1.4	3.1	1.30
0.0176	12.71	8.94	1.4	3.1	1.30
0.0180	12.85	9.04	1.4	3.1	1.30
0.0184	13.00	9.14	1.4	3.1	1.30
0.0188	13.14	9.24	1.4	3.1	1.30
0.0192	13.28	9.34	1.4	3.1	1.30
0.0196	13.41	9.44	1.4	3.1	1.30
0.0200	13.55	9.53	1.4	3.1	1.30
0.0204	13.69	9.63	1.4	3.1	1.30
0.0208	13.82	9.72	1.4	3.1	1.30
0.0212	13.95	9.81	1.4	3.1	1.30
0.0216	14.08	9.91	1.4	3.1	1.30
0.0220	14.21	10.00	1.4	3.1	1.30
0.0224	14.34	10.09	1.4	3.1	1.30
0.0228	14.47	10.18	1.4	3.1	1.30
0.0232	14.60	10.27	1.4	3.1	1.30
0.0236	14.72	10.35	1.4	3.1	1.30
0.0240	14.85	10.44	1.4	3.1	1.30
0.0244	14.97	10.53	1.4	3.1	1.30
0.0248	15.09	10.62	1.4	3.1	1.30
0.0252	15.21	10.70	1.4	3.1	1.30
0.0256	15.33	10.79	1.4	3.1	1.30
0.0260	15.45	10.87	1.4	3.1	1.30
0.0264	15.57	10.95	1.4	3.1	1.30
0.0268	15.69	11.04	1.4	3.1	1.30
0.0272	15.81	11.12	1.4	3.1	1.30
0.0276	15.92	11.20	1.4	3.1	1.30
0.0280	16.04	11.28	1.4	3.1	1.30
0.0284	16.15	11.36	1.4	3.1	1.30
0.0288	16.26	11.44	1.4	3.1	1.30
0.0292	16.38	11.52	1.4	3.1	1.30
0.0296	16.49	11.60	1.4	3.1	1.30
0.0300	16.60	11.68	1.4	3.1	1.30
0.0304	16.71	11.75	1.4	3.1	1.30
0.0308	16.82	11.83	1.4	3.1	1.30
0.0312	16.93	11.91	1.4	3.1	1.30
0.0316	17.04	11.98	1.4	3.1	1.30
0.0320	17.14	12.06	1.4	3.1	1.30
0.0324	17.25	12.13	1.4	3.1	1.30
0.0328	17.36	12.21	1.4	3.1	1.30
0.0332	17.46	12.28	1.4	3.1	1.30
0.0336	17.57	12.36	1.4	3.1	1.30
0.0340	17.67	12.43	1.4	3.1	1.30
0.0344	17.78	12.50	1.4	3.1	1.30
0.0348	17.88	12.58	1.4	3.1	1.30
0.0352	17.98	12.65	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0356	18.08	12.72	1.4	3.1	1.30
0.0360	18.19	12.79	1.4	3.1	1.30
0.0364	18.29	12.86	1.4	3.1	1.30
0.0368	18.39	12.93	1.4	3.1	1.30
0.0372	18.49	13.00	1.4	3.1	1.30
0.0376	18.59	13.07	1.4	3.1	1.30
0.0380	18.68	13.14	1.4	3.1	1.30
0.0384	18.78	13.21	1.4	3.1	1.30
0.0388	18.88	13.28	1.4	3.1	1.30
0.0392	18.98	13.35	1.4	3.1	1.30
0.0396	19.07	13.42	1.4	3.1	1.30
0.0400	19.17	13.48	1.4	3.1	1.30
0.0404	19.27	13.55	1.4	3.1	1.30
0.0408	19.36	13.62	1.4	3.1	1.30
0.0412	19.46	13.69	1.4	3.1	1.30
0.0416	19.55	13.75	1.4	3.1	1.30
0.0420	19.64	13.82	1.4	3.1	1.30
0.0424	19.74	13.88	1.4	3.1	1.30
0.0428	19.83	13.95	1.4	3.1	1.30
0.0432	19.92	14.01	1.4	3.1	1.30
0.0436	20.01	14.08	1.4	3.1	1.30
0.0440	20.11	14.14	1.4	3.1	1.30
0.0444	20.20	14.21	1.4	3.1	1.30
0.0448	20.29	14.27	1.4	3.1	1.30
0.0452	20.38	14.33	1.4	3.1	1.30
0.0456	20.47	14.40	1.4	3.1	1.30
0.0460	20.56	14.46	1.4	3.1	1.30
0.0464	20.65	14.52	1.4	3.1	1.30
0.0468	20.74	14.59	1.4	3.1	1.30
0.0472	20.83	14.65	1.4	3.1	1.30
0.0476	20.91	14.71	1.4	3.1	1.30
0.0480	21.00	14.77	1.4	3.1	1.30
0.0484	21.09	14.83	1.4	3.1	1.30
0.0488	21.18	14.89	1.4	3.1	1.30
0.0492	21.26	14.96	1.4	3.1	1.30
0.0496	21.35	15.02	1.4	3.1	1.30
0.0500	21.43	15.08	1.4	3.1	1.30
0.0504	21.52	15.14	1.4	3.1	1.30
0.0508	21.61	15.20	1.4	3.1	1.30
0.0512	21.69	15.26	1.4	3.1	1.30
0.0516	21.77	15.32	1.4	3.1	1.30
0.0520	21.86	15.38	1.4	3.1	1.30
0.0524	21.94	15.43	1.4	3.1	1.30
0.0528	22.03	15.49	1.4	3.1	1.30
0.0532	22.11	15.55	1.4	3.1	1.30
0.0536	22.19	15.61	1.4	3.1	1.30
0.0540	22.28	15.67	1.4	3.1	1.30
0.0544	22.36	15.73	1.4	3.1	1.30
0.0548	22.44	15.78	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft²)	Wetted Perimeter (ft)	Top Width (ft)
0.0552	22.52	15.84	1.4	3.1	1.30
0.0556	22.60	15.90	1.4	3.1	1.30
0.0560	22.68	15.96	1.4	3.1	1.30
0.0564	22.77	16.01	1.4	3.1	1.30
0.0568	22.85	16.07	1.4	3.1	1.30
0.0572	22.93	16.13	1.4	3.1	1.30
0.0576	23.01	16.18	1.4	3.1	1.30
0.0580	23.09	16.24	1.4	3.1	1.30
0.0584	23.17	16.29	1.4	3.1	1.30
0.0588	23.25	16.35	1.4	3.1	1.30
0.0592	23.32	16.41	1.4	3.1	1.30
0.0596	23.40	16.46	1.4	3.1	1.30
0.0600	23.48	16.52	1.4	3.1	1.30
0.0604	23.56	16.57	1.4	3.1	1.30
0.0608	23.64	16.63	1.4	3.1	1.30
0.0612	23.71	16.68	1.4	3.1	1.30
0.0616	23.79	16.74	1.4	3.1	1.30
0.0620	23.87	16.79	1.4	3.1	1.30
0.0624	23.95	16.84	1.4	3.1	1.30
0.0628	24.02	16.90	1.4	3.1	1.30
0.0632	24.10	16.95	1.4	3.1	1.30
0.0636	24.18	17.01	1.4	3.1	1.30
0.0640	24.25	17.06	1.4	3.1	1.30
0.0644	24.33	17.11	1.4	3.1	1.30
0.0648	24.40	17.16	1.4	3.1	1.30
0.0652	24.48	17.22	1.4	3.1	1.30
0.0656	24.55	17.27	1.4	3.1	1.30
0.0660	24.63	17.32	1.4	3.1	1.30
0.0664	24.70	17.38	1.4	3.1	1.30
0.0668	24.78	17.43	1.4	3.1	1.30
0.0672	24.85	17.48	1.4	3.1	1.30
0.0676	24.92	17.53	1.4	3.1	1.30
0.0680	25.00	17.58	1.4	3.1	1.30
0.0684	25.07	17.64	1.4	3.1	1.30
0.0688	25.14	17.69	1.4	3.1	1.30
0.0692	25.22	17.74	1.4	3.1	1.30
0.0696	25.29	17.79	1.4	3.1	1.30
0.0700	25.36	17.84	1.4	3.1	1.30
0.0704	25.44	17.89	1.4	3.1	1.30
0.0708	25.51	17.94	1.4	3.1	1.30
0.0712	25.58	17.99	1.4	3.1	1.30
0.0716	25.65	18.04	1.4	3.1	1.30
0.0720	25.72	18.09	1.4	3.1	1.30
0.0724	25.79	18.14	1.4	3.1	1.30
0.0728	25.87	18.19	1.4	3.1	1.30
0.0732	25.94	18.24	1.4	3.1	1.30
0.0736	26.01	18.29	1.4	3.1	1.30
0.0740	26.08	18.34	1.4	3.1	1.30
0.0744	26.15	18.39	1.4	3.1	1.30

Rating Table for 18 inch - 3/4 Full

Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.0748	26.22	18.44	1.4	3.1	1.30
0.0752	26.29	18.49	1.4	3.1	1.30
0.0756	26.36	18.54	1.4	3.1	1.30
0.0760	26.43	18.59	1.4	3.1	1.30
0.0764	26.50	18.64	1.4	3.1	1.30
0.0768	26.57	18.69	1.4	3.1	1.30
0.0772	26.64	18.74	1.4	3.1	1.30
0.0776	26.71	18.78	1.4	3.1	1.30
0.0780	26.77	18.83	1.4	3.1	1.30
0.0784	26.84	18.88	1.4	3.1	1.30
0.0788	26.91	18.93	1.4	3.1	1.30
0.0792	26.98	18.98	1.4	3.1	1.30
0.0796	27.05	19.03	1.4	3.1	1.30
0.0800	27.12	19.07	1.4	3.1	1.30