CITY OF ALBUQUERQUE

August 22, 2005

Ms. Genny Donart, PE
ISAACSON & ARFMAN, PA
120 Monroe St. NE
Albuquerque, NM 87108

RE: TREMENTINA SUBDIVISION, UNIT 3 (C-19/D35)
Engineers Certification for Release of Financial Guaranty
Engineers Stamp dated 06/17/2003
Engineers Certification dated 08/22/2005

Dear Genny:

Based upon the information provided in your Engineer's Certification Submittal dated 08/22/2005, the above referenced plan is adequate to satisfy the Grading and Drainage Certification for Release of Financial Guaranty.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Arlene V. Portillo
Plan Checker, Planning Dept.- Hydrology
Development and Building Services

C: Marilyn Maldonado, COA# 702482
File

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE REPORT

FOR

VISTA DEL AGUILA UNIT THREE & TREMENTINA SUBDIVISION

73-LOT & 61-LOT SINGLE FAMILY RESIDENTIAL SUBDIVISIONS

ALBUQUERQUE, NEW MEXICO
MAY 2003

Prepared by:

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GENEVIEVE L. DONART
NEW MEXICO
15088
LICENSED PROFESSIONAL ENGINEER

Genevieve L. Donart 5/30/03

Genevieve L. Donart, PE **Date**

REVISED
6/17/03 GLD

II. INTRODUCTION

The Vista del Aguila Unit Three and Trementina Subdivisions are two North Albuquerque Acres projects which lie on either side of Alameda Blvd between Louisiana and Wyoming. These subdivisions are in the same drainage basins and will be developed together, so this report covers both subdivisions. Both are single-family residential developments, with 73 lots in Vista Del Aguila Unit Three and 61 lots in Trementina. Adjacent portions of Alameda Blvd are drained and constructed by this plan. Provisions are made for future development of offsite lots that affect the drainage in Alameda.

This area is covered under the Final North Albuquerque Acres Drainage Master Plan (NAA MDP) dated October 1998, and falls within drainage basins 117.4 and 934.1 as defined in the NAA MDP.

This report also references the Drainage Report for Eagle Springs Subdivision dated January 9, 2001 (ES Report) and the LOMR for Quail Springs Subdivision dated March 4, 1997. Eagle Springs is the existing subdivision adjacent to the south boundary of Trementina. Flows from the NAA MDP basin 934.1 will be diverted into a storm drain which runs through Eagle Springs. A LOMR for Quail Springs Subdivision removed portions of a former floodplain on the site, the remainder of which will be removed by Vista del Aguila 3.

III. EXISTING CONDITIONS

The proposed sites are a total of 20 undeveloped North Albuquerque Acres lots, with native grasses and scrub brush. The natural ground slopes downhill to the west at approximately a 3% grade. To the north is the Quail Springs Subdivision and to the south is the Eagle Springs Subdivision. Alameda Blvd runs directly between the projects. Vista del Aguila Unit Three is bordered by Louisiana Blvd to the west, and there are five undeveloped lots upstream of the subdivision, between the east boundary and Wyoming Blvd. Trementina has five undeveloped lots to the west and two upstream to the east.

There is an abandoned arroyo within Vista del Aguila Unit Three that used to carry flows discharged from La Cueva High School. Those former offsite flows are now captured by a storm drain system in Wyoming Blvd and no longer affect the site, but portions of that floodplain still exist. This floodplain will be removed by LOMR prior to financial guarantee release.

The only existing storm drain facilities in the project area are an asphalt tailings swale along the south side of Alameda, and a storm drain connection through an HOA tract in Eagle Springs to the south. According to the ES Report, the downstream storm drain was under-designed for the fully-developed flows designated in the NAA MDP for Basin 934.1, and the amount of storm water entering the system must be reduced by 21.99 cfs. (See excerpts in Appendix D)

Existing storm water flows from Basins 100, 101, and 110 totaling 64.1 cfs travel west towards Louisiana, where small storms pond on Lot 32, block 3 and Lot 1, block 4. (See the Existing Basin Map in the pockets and calculations in Appendix A) Larger storms overtop Louisiana and water continues west in the asphalt swale along Alameda.

IV. PROPOSED CONDITIONS

Grading & Drainage Plans for both subdivisions are in the pockets at the back of this report. Drainage basin boundaries were determined based on the conceptual grades established in this plan, and by street flow capacity and storm drain requirements. (See the Proposed Basin Map in the pockets.) Land treatments for proposed conditions are as follows:

TABLE 1

Treatment Type	Percentages		
	Onsite*	Offsite	Alameda
Type A	0%	100%	0%
Type B	14.6%	0%	21%
Type C	14.5%	0%	21%
Type D	70.9%	0%	58%

* Onsite Land Treatments were calculated per the Typical Lot Detail in Appendix B

These land treatments were used to calculate flows within each basin. (See calculations in Appendix A.) Basins 201, 202, 321 and 322 are offsite and considered undeveloped in the proposed condition. Basins 210a, 210b, 310, and 311 include Alameda Blvd. All others are to be developed by these projects.

Both Vista del Aguila Unit Three and Trementina have only mountable curb inside the projects due to a reduced distance from the back of curb to the right-of-way line. Street flow capacities are therefore reduced compared with a similar project that uses standard curb, and storm inlets are required more frequently. Street Flow Capacity Calculations can be found in Appendix B and HydraFlow Storm Sewer Calculations are in Appendix C.

VISTA DEL AGUILA 3:

There are two main outlet points from Vista Del Aguila Unit Three: at the south ends of Dancing Eagle Ct (AP30) and Eagle Feather Ct (AP32). All upstream flows are captured in storm inlets prior to leaving these hammerheads, and empty to the west Alameda storm drain.

Contributing basins for the combined flows at AP30 are Basins 302a, 302b, and 302c. Basin boundaries are located where storm inlets in Dancing Eagle Ave are

required because street flow capacities are exceeded. A sump inlet collects the remaining water at the end of Dancing Eagle Ct.

Contributing basins for the combined flows at AP32 are Basins 304a and 304b. No storm inlets are required in Eagle Feather Rd, but a sump inlet collects the water at the end of Eagle Feather Ct.

Basins 301 and 303 direct about 1.7 cfs each to Alameda Blvd.

No offsite storm water enters the subdivision. Basin 201 slopes down towards Alameda, preventing ponding along the eastern perimeter wall. All flows from Quail Springs are directed north into that subdivision.

TREMENTINA:

Because of the basin split called out in the NAA MDP and the storm drain in Eagle Springs, Trementina requires two storm drain systems. The first will capture offsite flows form the east and north sides of Alameda (Basins 201 and 210a. The combined flows are captured and directed to the existing storm drain stub.

Based on the ES Report, this stub has a limited capacity because of downstream conditions. To reduce the flows entering that system, five existing North Albuquerque Acres lots (approximately 5 acres) were removed from the limits of the NAA MDP basin 934.1. Using the land treatments for the development, the subdivisions generate 4.4 cfs/acre: 4.4 cfs/acre x 5 acres = 22 cfs

Five acres removed from the basin reduces flows into the existing system by 21.99 cfs, as required in the ES Report.

The second storm drain system collects the remaining water from Trementina (Basins 320a, 320b, and 320c). All water from this system empties into the west Alameda storm drain. Basin boundaries are located where storm inlets in Via Contenta are required because street flow capacities are exceeded. A sump inlet at the end of Via de Paz collects water from Basin 320c.

No offsite storm water enters the subdivision. Basin 202 slopes down towards Alameda, preventing ponding along the eastern perimeter wall. All flows from Eagle Springs are directed south away from this project.

ALAMEDA BLVD:

Portions of Alameda Blvd adjacent to the proposed subdivisions will be developed to half the final width. As required in the COA DPM, one lane in each direction must

remain free of storm water in the 10-year, 6-hour storm. Street flow capacities are designed so that only 20 feet of the 30 feet of paving in each direction carries water.

Undeveloped flows from Basins 202 and 210A enters Alameda from the east end. Inlets at AP10 capture water from this basin. These flows combine with Basin 203 and 320a, and divert to the Eagle Springs storm drain.

Developed flows from the subdivisions enter the west Alameda storm drain at AP20, AP30, AP32, and minor flows enter Alameda from Basin 301 and 303. Inlets at AP11, AP21 and AP31 capture flows generated in the right-of-way and undeveloped flows from Basins 201 and 321.

Inlets in Alameda will only be installed where there is curb proposed at this time. Future development will be responsible for inlets in adjacent portions of Alameda as they are constructed.

The NAA MDP requires that storm drain eventually be constructed downstream in Alameda from Louisiana to San Pedro, and then connect with the La Cueva Channel to the north. Because this connection has not yet been built, flows that enter the west Alameda storm drain are routed to a retention pond at the southeast corner of the intersection of Alameda and Louisiana (Basin 322). This pond is sized for the 100-year, 10-day developed volumes from Vista del Aguila Unit Three, Trementina, and Alameda Blvd, and the undeveloped volumes from all other basins.

V. FUTURE CONDITIONS

In the future, as lots designated as undeveloped in the proposed condition develop, the flows in the system will increase. This report assumes that Basins 201a, 201b, 202, and 321 will have similar land treatments to the basins within the proposed subdivisions. Basin 322 is zoned as SU-2/C-1, so it was assumed that the land treatments will be different from the residential areas. Land treatments for future conditions are as follows:

TABLE 4

Treatment Type	Percentages		
	Onsite & Offsite*	Basin 322	Alameda
Type A	0%	0%	0%
Type B	14.6%	5%	21%
Type C	14.5%	5%	21%
Type D	70.9%	90%	58%

* Onsite Land Treatments were calculated per the Typical Lot Detail in Appendix B

These land treatments were used to calculate future flows and volumes. (See Runoff Calculations for Future Conditions in Appendix A.) The storm drain in Alameda is sized for the fully-developed condition, but the pond is sized only for the proposed condition. Offsite lots will be required to retain all developed stormwater on their properties.

Once future expansion of the downstream storm drain in Alameda allows for free discharge to the La Cueva Channel, the retention ponds can be removed by a separate grading plan. The City of Albuquerque and AMAFCA will determine the when the system is approved for free discharge.

VI. SUMMARY & CONCLUSIONS

Based on information in previous sections, it is recommended that the following items be constructed with each of the noted developments:

Vista del Aguila Unit Three:

1. Mountable curb on all interior streets
2. Standard curb on Alameda Blvd.
3. Storm drain in Dancing Eagle Ave with 2 single-grate inlets at Lot 13, Blk C, another 2 single-grate inlets at Lot 7, Blk B, and a double-grate sump inlet at the south end of Dancing Eagle Ct. The storm drain outlets through a 20' wide storm drain easement on Lot 14, Blk B.
4. Storm drain with a triple-grate sump inlet at the south end of Eagle Feather Ct. The storm drain outlets through a 20' wide storm drain easement on Lot 17, Blk A.
5. All Alameda Blvd drainage improvements up to the east edge of the subdivision.
6. A minimum of 2.768 Ac-ft of retention pond and 1 foot of freeboard on the two lots at the southeast corner of Alameda and Louisiana. A blanket public drainage easement and a Covenant & Agreement shall be provided for these lots.
7. A LOMR will remove the floodplain prior to financial guarantee release.

Trementina:

1. Mountable curb on all interior streets
2. Standard curb on Alameda Blvd.
3. Storm drain in Via Contenta with 2 single-grate inlets at Lot 3, Blk B, another 2 single-grate inlets at Lot 11, Blk B, and a double-grate sump inlet at the south end of Via de Paz. The system connects to the west Alameda storm drain.
4. Storm drain in Via Contenta with 2 single-grate inlets at Lot 40, Blk A. The system outlets to the existing Eagle Springs storm drain through a 25' wide drainage easement on Lot 17, Blk A.
5. All Alameda Blvd drainage improvements up to the east edge of the subdivision.
6. A minimum of 5.445 Ac-ft of retention pond and 1 foot of freeboard on the two lots at the southeast corner of Alameda and Louisiana. A blanket public drainage easement and a Covenant & Agreement shall be provided for these lots.

Alameda Blvd:

1. Standard curb on all portions of the street adjacent to the proposed subdivisions.
2. One single-grate storm inlet on the south side of Alameda east of Via Feliz. This system will route through Trementina to the existing Eagle Spring storm drain.
3. Storm drain from Via Feliz to Louisiana Blvd with a double-grate inlet on the north side of Alameda upstream of Via de Paz, and a single-grate inlet on the north side of Alameda adjacent to the ends of Dancing Eagle Ct and Eagle Feather Ct. This system will empty to the retention pond.

In the future, the following items shall be constructed by offsite development:

Future Conditions:

1. Temporary retention ponds on offsite properties to retain the developed volumes for that property.
2. A single-grate inlet on the north side of Alameda between Lots 18 & 19, NAA, Unit 3, Tract 2, Block 4 to capture developed flows from Basin 201A.
3. The first lot within Basin 321 must construct inlets to capture the flows from that basin.
4. Once completion of future expansion of the downstream storm drain in Alameda allows for free discharge to the La Cueva Channel, the retention pond on Basin 322 and any individual lot retention ponds can be removed by separate grading plans. Free discharge and pond removals are subject to City of Albuquerque and AMAFCA approval.
5. When Basin 322 is available to develop, the blanket drainage easement shall be vacated, and an inlet shall be constructed to capture flows from that basin.

SUMMARY OF FLOWS AT ANALYSIS POINTS

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

EXISTING FLOWS				
BASIN	Q_{100} (cfs)	CUMULATIVE FLOWS	ANALYSIS PT	Q_{100} AT AP (cfs)
100	26.05	26.05		
101	25.91	51.95		
110	12.15	64.10	AP1	64.10

EXISTING VOLUMES (100-year, 6-hour)				
BASIN	V_{100} (Ac-ft)	CUMULATIVE VOLUMES	ANALYSIS PT	V_{100} AT AP (Ac-ft)
100	0.7661	0.7661		
101	0.7620	1.5281		
110	0.4438	1.9719	AP1	1.9719

PROPOSED FLOWS				
BASIN	Q_{100} (cfs)	CUMULATIVE FLOWS	ANALYSIS PT	Q_{100} AT AP (cfs)
202	3.02	3.02		
210a	4.29	7.31	AP10	7.31
203	6.53	6.53		
320a	9.11	15.64	AP12	22.95
210b	2.76	2.76		
201	8.01	10.77	AP11	10.77
320b	8.03	8.03		
320c	6.65	14.68	AP20	14.68
301	1.71	1.71		
310	11.10	12.81	AP21	38.26
302a	8.51	8.51		
302b	9.51	18.02		
302c	4.79	22.81	AP30	22.81
303	1.72	1.72		
311	7.02	8.74		
321	4.98	13.72	AP31	74.80
304a	7.56	7.56		
304b	2.93	10.49	AP32	10.49
322	3.01	13.51	AP33	88.31

PROPOSED VOLUMES (100-year, 6-hour)				
BASIN	V_{100} (Ac-ft)	CUMULATIVE VOLUMES	ANALYSIS PT	V_{100} AT AP (Ac-ft)
202	0.0889	0.0889		
210a	0.1566	0.2455	AP10	0.2455
203	0.2447	0.2447		
320a	0.3411	0.5858	AP12	0.8312
210b	0.1010	0.1010		
201	0.2355	0.3365	AP11	0.3365
320b	0.3009	0.3009		
320c	0.2488	0.5497	AP20	0.5497
301	0.0640	0.0640		
310	0.4055	0.4695	AP21	1.3557
302a	0.3186	0.3186		
302b	0.3562	0.6748		
302c	0.1793	0.8542	AP30	0.8542
303	0.0645	0.0645		
311	0.2563	0.3208		
321	0.1466	0.4674	AP31	2.6772
304a	0.2832	0.2832		
304b	0.1097	0.3929	AP32	0.3929
322	0.0887	0.4816	AP33	3.1588

SUMMARY OF FLOWS AT ANALYSIS POINTS

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

FUTURE FLOWS

BASIN	Q_{100} (cfs)	CUMULATIVE FLOWS	ANALYSIS PT	Q_{100} AT AP (cfs)
202	7.18	7.18		
210a	4.29	11.46	AP10	11.46
203	6.53	6.53		
320a	9.11	15.64	AP12	27.11
210b	2.76	2.76		
201	11.83	14.59	AP11	14.59
320b	8.03	8.03		
320c	6.65	14.68	AP20	14.68
301	1.71	1.71		
310	11.10	12.81	AP21	42.09
302a	8.51	8.51		
302b	9.51	18.02		
302c	4.79	22.81	AP30	22.81
303	1.72	1.72		
311	7.02	8.74		
321	11.83	20.57	AP31	85.46
304a	7.56	7.56		
304b	2.93	10.49	AP32	10.49
322	7.77	18.26	AP33	103.73

FUTURE VOLUMES

NOTE: Future Volumes in the retention pond designed by this project are less than the Proposed Volumes. Any lots shown as undeveloped in the Proposed Condition in this report that develop in the future must retain developed volumes on that property until future expansion of the downstream storm drain in Alameda allows for free discharge to the La Cueva Channel. (Free discharge to be approved by the City of Albuquerque and AMAFCA)

RUNOFF CALCULATIONS FOR EXISTING CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

PRECIP ZONE	Q_{100} RUNOFF RATES (cfs/Ac)			
	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	100	50		
B	0	0		
C	0	0		
D	0	50		
∑% =	100	100	0	0

PRECIPITATION ZONE: 3

TREATMENT TYPE 1							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
100	13.929	13.93	0	0	0	**26.0**	North of Alameda between Louisiana & Wyoming
101	13.854	13.85	0	0	0	**25.9**	South of Alameda between Louisiana & Wyoming

TREATMENT TYPE 2							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
110	3.527	1.76	0	0	1.76	**12.2**	Alameda Blvd R/W

VOLUME CALCULATIONS FOR EXISTING CONDITIONS (V_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

PRECIP ZONE	E_{360} EXCESS PRECIPITATION (in.)			
	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	100	50	0	0
B	0	0	0	0
C	0	0	0	0
D	0	50	0	0
∠% =	100	100	0	0

PRECIPITATION ZONE: 3

TREATMENT TYPE 1								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
100	13.929	13.93	0	0	0	**0.7661**	**33371.1**	
101	13.854	13.85	0	0	0	**0.7620**	**33191.4**	

TREATMENT TYPE 2								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
110	3.527	1.76	0	0	1.76	**0.4438**	**19332.5**	

RUNOFF CALCULATIONS FOR PROPOSED CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

PRECIP ZONE	Q_{100} RUNOFF RATES (cfs/Ac)			
	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	100	0	
B	14.6	0	21	
C	14.5	0	21	
D	70.9	0	58	
Σ% =	100	100	100	0

PRECIPITATION ZONE: 3

TREATMENT TYPE 1 (PROPOSED SUBDIVISION)							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
203	1.472	0	0.21	0.21	1.04	**6.5**	Trementina-Via Contenta east of 11+50
301	0.385	0	0.06	0.06	0.27	**1.7**	Vista 3 - Via Feliz
302a	1.917	0	0.28	0.28	1.36	**8.5**	Vista 3 - Dancing Eagle Ave
302b	2.143	0	0.31	0.31	1.52	**9.5**	Vista 3 - Dancing Eagle Ave
302c	1.079	0	0.16	0.16	0.77	**4.8**	Vista 3 - Dancing Eagle Ct
303	0.388	0	0.06	0.06	0.28	**1.7**	Vista 3 - Eagle Talon Dr
304a	1.704	0	0.25	0.25	1.21	**7.6**	Vista 3 - Eagle Feather Rd
304b	0.66	0	0.10	0.10	0.47	**2.9**	Vista 3 - Eagle Feather Ct
320a	2.052	0	0.30	0.30	1.45	**9.1**	Trementina-Via Contenta (sta 7+00-11+50)
320b	1.81	0	0.26	0.26	1.28	**8.0**	Trementina-Via Contenta (sta 3+00-7+00)
320c	1.497	0	0.22	0.22	1.06	**6.6**	Trementina-Via de Paz

RUNOFF CALCULATIONS FOR PROPOSED CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

TREATMENT TYPE 2 (UNDEVELOPED LAND)							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
201	4.282	4.28	0	0	0	**8.0**	N. of Alameda, e. of Via Feliz
202	1.617	1.62	0	0	0	**3.0**	S. of Alameda, e. of Trementina
321	2.665	2.67	0	0	0	**5.0**	S. of Alameda, w. of Trementina
322	1.612	1.61	0	0	0	**3.0**	Pond Lots

TREATMENT TYPE 3 (ALAMEDA BLVD)							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
210a	1.025	0	0.22	0.22	0.59	**4.3**	Alameda R/W, e. of Via Feliz, n. side
210b	0.661	0	0.14	0.14	0.38	**2.8**	Alameda R/W, e. of Via Feliz, s. side
310	2.655	0	0.56	0.56	1.54	**11.1**	Alameda R/W, middle section
311	1.678	0	0.35	0.35	0.97	**7.0**	Alameda R/W,Louisiana to Trementina

VOLUME CALCULATIONS FOR PROPOSED CONDITIONS (V_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

PRECIP ZONE	E_{360} EXCESS PRECIPITATION (in.)			
	A	B	C	D
1	0.44	0.67	0.99	1.97
2	0.53	0.78	1.13	2.12
3	0.66	0.92	1.29	2.36
4	0.80	1.08	1.46	2.64

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	100	0	0
B	14.6	0	21	0
C	14.5	0	21	0
D	70.9	0	58	0
∑% =	100	100	100	0

PRECIPITATION ZONE: 3

TREATMENT TYPE 1								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
203	1.472	0	0.21	0.21	1.04	**0.2447**	**10657.9**	
301	0.385	0	0.06	0.06	0.27	**0.0640**	**2787.6**	
302a	1.917	0	0.28	0.28	1.36	**0.3186**	**13879.9**	
302b	2.143	0	0.31	0.31	1.52	**0.3562**	**15516.3**	
302c	1.079	0	0.16	0.16	0.77	**0.1793**	**7812.4**	
303	0.388	0	0.06	0.06	0.28	**0.0645**	**2809.3**	
304a	1.704	0	0.25	0.25	1.21	**0.2832**	**12337.7**	
304b	0.66	0	0.10	0.10	0.47	**0.1097**	**4778.7**	
320a	2.052	0	0.30	0.30	1.45	**0.3411**	**14857.4**	
320b	1.81	0	0.26	0.26	1.28	**0.3009**	**13105.2**	
320c	1.497	0	0.22	0.22	1.06	**0.2488**	**10838.9**	

VOLUME CALCULATIONS FOR PROPOSED CONDITIONS (V_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

TREATMENT TYPE 2								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
201	4.282	4.28	0	0	0	**0.2355**	**10258.8**	
202	1.617	1.62	0	0	0	**0.0889**	**3874.0**	
321	2.665	2.67	0	0	0	**0.1466**	**6384.8**	
322	1.612	1.61	0	0	0	**0.0887**	**3862.0**	

TREATMENT TYPE 3								
BASIN #	LAND TREATMENT AREAS (Ac)					V_{100} (Ac-ft)	V_{100} (cu.ft.)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D			
210a	1.025	0	0.22	0.22	0.59	**0.1566**	**6819.8**	
210b	0.661	0	0.14	0.14	0.38	**0.1010**	**4397.9**	
310	2.655	0	0.56	0.56	1.54	**0.4055**	**17664.8**	
311	1.678	0	0.35	0.35	0.97	**0.2563**	**11164.5**	

RETENTION POND VOLUMES

FOR 100-YEAR, 10-DAY STORM

P_{360} = 2.54 in (from Fig. C-2, COA DPM)

P_{1440} = 2.93 in (from Fig. C-3, COA DPM)

V_{360} = 3.1588 Ac-ft (from Volume calcs)

A_D = 14.2042 Ac

$P_{10day} = 10 - [24.9/(P_{1440})^{1.4}]$

P_{10day} = 4.471788 in

$V_{10day} = V_{360} + A_D(P_{10day} - P_{360})/12$

V_{10day} = 5.4454 Ac-ft => 237203 cu. ft.

RUNOFF CALCULATIONS FOR FUTURE, FULLY-DEVELOPED CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

PROJECT NAME: **VISTA DEL AGUILA UNIT 3**

JOB NUMBER: 1257

PRECIP ZONE	Q_{100} RUNOFF RATES (cfs/Ac)			
	A	B	C	D
1	1.29	2.03	2.87	4.37
2	1.56	2.28	3.14	4.70
3	1.87	2.60	3.45	5.02
4	2.20	2.92	3.73	5.25

% LAND TREATMENTS				
	TREAT TYPE 1	TREAT TYPE 2	TREAT TYPE 3	TREAT TYPE 4
A	0	0	0	
B	14.6	21	5	
C	14.5	21	5	
D	70.9	58	90	
Σ% =	100	100	100	0

PRECIPITATION ZONE: 3

TREATMENT TYPE 1 (DEVELOPED RESIDENTIAL)							
BASIN #	LAND TREATMENT AREAS (Ac)					Q_{100} (cfs)	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
201	4.282	0	0.63	0.62	3.04	**19.0**	N. of Alameda, e. of Trementina
202	1.617	0	0.24	0.23	1.15	**7.2**	S. of Alameda, e. of Trementina
203	1.472	0	0.21	0.21	1.04	**6.5**	Trementina-Via Contenta east of 11+50
301	0.385	0	0.06	0.06	0.27	**1.7**	Vista 3 - Via Feliz
302a	1.917	0	0.28	0.28	1.36	**8.5**	Vista 3 - Dancing Eagle Ave
302b	2.143	0	0.31	0.31	1.52	**9.5**	Vista 3 - Dancing Eagle Ave
302c	1.078	0	0.16	0.16	0.76	**4.8**	Vista 3 - Dancing Eagle Ct
303	0.388	0	0.06	0.06	0.28	**1.7**	Vista 3 - Eagle Talon Dr
304a	1.704	0	0.25	0.25	1.21	**7.6**	Vista 3 - Eagle Feather Rd
304b	0.66	0	0.10	0.10	0.47	**2.9**	Vista 3 - Eagle Feather Ct
320a	2.052	0	0.30	0.30	1.45	**9.1**	Trementina-Via Contenta (sta 7+00-11+50)
320b	1.81	0	0.26	0.26	1.28	**8.0**	Trementina-Via Contenta (sta 3+00-7+00)
320c	1.497	0	0.22	0.22	1.06	**6.6**	Trementina-Via de Paz
321	2.665	0	0.39	0.39	1.89	**11.8**	S. of Alameda, w. of Trementina

RUNOFF CALCULATIONS FOR FUTURE, FULLY-DEVELOPED CONDITIONS (Q_{100})

100-YEAR, 6-HOUR STORM

Per the City of Albuquerque D.P.M. Section 22.2

TREATMENT TYPE 2 (ALAMEDA BLVD)							
BASIN #	LAND TREATMENT AREAS (Ac)					**Q_{100} (cfs)**	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
210a	1.025	0	0.22	0.22	0.59	**4.3**	Alameda R/W, e. of Via Feliz
210b	0.661	0	0.14	0.14	0.38	**2.8**	Alameda R/W, e. of Via Feliz
310	2.655	0	0.56	0.56	1.54	**11.1**	Alameda R/W, middle section
311	1.678	0	0.35	0.35	0.97	**7.0**	Alameda R/W,Louisiana to Trementina

TREATMENT TYPE 3 (COMMERCIAL)							
BASIN #	LAND TREATMENT AREAS (Ac)					**Q_{100} (cfs)**	REMARKS
	A_{TOTAL}	A_A	A_B	A_C	A_D		
322	1.612	0	0.08	0.08	1.45	**7.8**	Future commercial - SE cor of Alameda
		0	0.00	0.00	0.00	**0.0**	and Louisiana

TABLE 3

STREET FLOW DEPTH SUMMARY - VISTA DEL AGUILA 3

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{100} (cfs)	DEPTH (ft)	EGL DEPTH (ft)
Dancing Eagle Ave	Sta 16+50 to Via Feliz	28' F-F	mtbl	0.0373	9.11	0.22	0.44
Dancing Eagle Ave	Sta 1+00 to 16+50	28' F-F	mtbl	0.0262	8.03	0.22	0.39
Dancing Eagle Ct	0	28' F-F	mdn	0.0110	4.79	0.29	0.36
Eagle Feather Rd	0	28' F-F	mtbl	0.0329	7.56	0.21	0.40
Eagle Feather Ct	0	24' F-F	mtbl	0.0175	10.49	0.26	0.41
Via Feliz (X2)	Dancing Eagle to Alameda	56' F-F	mtbl	0.0050	3.42	0.22	0.25
Eagle Talon Dr (X2)	Eagle Feather to Alameda	56' F-F	mtbl	0.0111	3.44	0.19	0.25

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Dancing Eagle Ave** 1
LOCATION: **Sta 16+50 to Via Feliz**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0373	Road Width/2	14
Q_{100}	9.11	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	11.220
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.210
Manning's N	0.017	Discharge (1/2 Q)	4.594

Depth 0.220

RESULTS

HGL

Q_{100} FLOW CAPACITY = **9.19 cfs** OK
at an HGL Depth= **0.22 ft** < Curb height = 0.33
OK

EGL

Velocity 3.80 fps
$V^2/2g$ 0.22 ft
EGL Depth = **0.44 ft** < Right-of-way height = 0.44
OK

STREET NAME: **Dancing Eagle Ave** 2
LOCATION: **Sta 1+00 to 16+50**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0262	Road Width/2	14
Q_{100}	8.03	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	11.424
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.254
Manning's N	0.017	Discharge (1/2 Q)	4.040

Depth 0.224

RESULTS

HGL

Q_{100} FLOW CAPACITY = **8.08 cfs** OK
at an HGL Depth= **0.22 ft** < Curb height = 0.33
OK

EGL

Velocity 3.22 fps
$V^2/2g$ 0.16 ft
EGL Depth = **0.39 ft** < Right-of-way height = 0.44
OK

STREET NAME: **Dancing Eagle Ct** 3
LOCATION:

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.011	Road Width/2	14
Q_{100}	4.79	Curb Height	0.50
Right-of-way Width	50	1/2 Wetted Perimeter (P)	10.642
Road Width	28	1/2 Area(STD)	----
Curb Type	mdn	1/2 Area(MDN)	1.156
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	2.396

Depth 0.292

RESULTS

HGL

Q_{100} FLOW CAPACITY = **4.79 cfs** OK
at an HGL Depth= **0.29 ft** < Curb height = 0.50
OK

EGL

Velocity 2.07 fps
$V^2/2g$ 0.07 ft
EGL Depth = **0.36 ft** < Right-of-way height = 0.71
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Eagle Feather Rd** 4
LOCATION:

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0329	Road Width/2	14
Q_{100}	7.56	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	10.710
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.103
Manning's N	0.017	Discharge (1/2 Q)	3.810

Depth 0.210

RESULTS

HGL

Q_{100} FLOW CAPACITY = **7.62 cfs** OK
at an HGL Depth= **0.21 ft** < Curb height = 0.33
OK

EGL

Velocity 3.46 fps
$V^2/2g$ 0.19 ft
EGL Depth = **0.40 ft** < Right-of-way height = 0.44
OK

STREET NAME: **Eagle Feather Ct** 5
LOCATION:

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0175	Road Width/2	12
Q_{100}	10.49	Curb Height	0.33
Right-of-way Width	44	1/2 Wetted Perimeter (P)	12.262
Road Width	24	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.704
Manning's N	0.017	Discharge (1/2 Q)	5.252

Depth 0.262

RESULTS

HGL

Q_{100} FLOW CAPACITY = **10.50 cfs** OK
at an HGL Depth= **0.26 ft** < Curb height = 0.33
OK

EGL

Velocity 3.08 fps
$V^2/2g$ 0.15 ft
EGL Depth = **0.41 ft** < Right-of-way height = 0.52
OK

STREET NAME: **Via Feliz (X2)** 6
LOCATION: **Dancing Eagle to Alameda**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.005	Road Width/2	28
Q_{100}	3.42	Curb Height	0.33
Right-of-way Width	74	1/2 Wetted Perimeter (P)	11.322
Road Width	56	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.232
Manning's N	0.017	Discharge (1/2 Q)	1.723

Depth 0.222

RESULTS

HGL

Q_{100} FLOW CAPACITY = **3.45 cfs** OK
at an HGL Depth= **0.22 ft** < Curb height = 0.33
OK

EGL

Velocity 1.40 fps
$V^2/2g$ 0.03 ft
EGL Depth = **0.25 ft** < Right-of-way height = 0.50
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME:	**Eagle Talon Dr (X2)**	7
LOCATION:	**Eagle Feather to Alameda**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0 0111	Road Width/2	28
Q_{100}	3.44	Curb Height	0.33
Right-of-way Width	74	1/2 Wetted Perimeter (P)	9.792
Road Width	56	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.922
Manning's N	0.017	Discharge (1/2 Q)	1.742

Depth 0.192

RESULTS

HGL

Q_{100} FLOW CAPACITY = **3.48 cfs** OK
at an HGL Depth= **0.19 ft** < Curb height = 0.33
OK

EGL

Velocity 1.89 fps
$V^2/2g$ 0.06 ft
EGL Depth = **0.25 ft** < Right-of-way height = 0.50
OK

TABLE 4

STREET FLOW DEPTH SUMMARY - TREMENTINA

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{100} (cfs)	DEPTH (ft)	EGL DEPTH (ft)
Via Contenta	Sta 11+50 to hammerhead	28' F-F	mtbl	0.0405	6.53	0.19	0.39
Via Contenta	Sta 10+00 to 11+50 (approx 1/	28' F-F	mtbl	0.0405	3.04	0.14	0.28
Via Contenta	Sta 7+00 to 10+00	28' F-F	mtbl	0.0347	9.11	0.22	0.44
Via Contenta	Sta 3+00 to 7+00	28' F-F	mtbl	0.0372	8.03	0.21	0.42
Via Contenta	Via de Paz to 3+00	28' F-F	mtbl	0.0469	4.79	0.17	0.36
Via de Paz (X2)	Alameda to Via Contenta	64' F-F	mtbl	0.0284	9.58	0.24	0.42
Via Feliz (X2)	Alameda to Via Contenta	64' F-F	mtbl	0.0351	2	0.13	0.23

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Via Contenta** 1
LOCATION: **Sta 11+50 to hammerhead**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0405	Road Width/2	14
Q_{100}	6.53	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	9.741
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.912
Manning's N	0.017	Discharge (1/2 Q)	3.282

Depth 0.191

RESULTS

HGL

Q_{100} FLOW CAPACITY = 6.56 cfs OK
at an HGL Depth= 0.19 ft < Curb height = 0.33
OK

EGL

Velocity 3.60 fps
$V^2/2g$ 0.20 ft
EGL Depth = 0.39 ft < Right-of-way height = 0.44
OK

STREET NAME: **Via Contenta** 2
LOCATION: **Sta 10+00 to 11+50 (approx 1/3 of basin 320a)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0405	Road Width/2	14
Q_{100}	3.04	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	7.344
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.518
Manning's N	0.017	Discharge (1/2 Q)	1.544

Depth 0.144

RESULTS

HGL

Q_{100} FLOW CAPACITY = 3.09 cfs OK
at an HGL Depth= 0.14 ft < Curb height = 0.33
OK

EGL

Velocity 2.98 fps
$V^2/2g$ 0.14 ft
EGL Depth = 0.28 ft < Right-of-way height = 0.44
OK

STREET NAME: **Via Contenta** 3
LOCATION: **Sta 7+00 to 10+00**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0347	Road Width/2	14
Q_{100}	9.11	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	11.373
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.243
Manning's N	0.017	Discharge (1/2 Q)	4.594

Depth 0.223

RESULTS

HGL

Q_{100} FLOW CAPACITY = 9.19 cfs OK
at an HGL Depth= 0.22 ft < Curb height = 0.33
OK

EGL

Velocity 3.70 fps
$V^2/2g$ 0.21 ft
EGL Depth = 0.44 ft < Right-of-way height = 0.44
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Via Contenta** 4
LOCATION: **Sta 3+00 to 7+00**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0372	Road Width/2	14
Q_{100}	8.03	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	10.710
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.103
Manning's N	0.017	Discharge (1/2 Q)	4.052

Depth: 0.210

RESULTS

HGL

Q_{100} FLOW CAPACITY = 8.10 cfs OK
at an HGL Depth= 0.21 ft < Curb height = 0.33
OK

EGL

Velocity 3.68 fps
$V^2/2g$ 0.21 ft
EGL Depth = 0.42 ft < Right-of-way height = 0.44
OK

STREET NAME: **Via Contenta** 5
LOCATION: **Via de Paz to 3+00**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0469	Road Width/2	14
Q_{100}	4.79	Curb Height	0.33
Right-of-way Width	40	1/2 Wetted Perimeter (P)	8.466
Road Width	28	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.689
Manning's N	0.017	Discharge (1/2 Q)	2.428

Depth: 0.166

RESULTS

HGL

Q_{100} FLOW CAPACITY = 4.86 cfs OK
at an HGL Depth= 0.17 ft < Curb height = 0.33
OK

EGL

Velocity 3.53 fps
$V^2/2g$ 0.19 ft
EGL Depth = 0.36 ft < Right-of-way height = 0.44
OK

STREET NAME: **Via de Paz (X2)** 6
LOCATION: **Alameda to Via Contenta**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0284	Road Width/2	32
Q_{100}	9.58	Curb Height	0.33
Right-of-way Width	82	1/2 Wetted Perimeter (P)	12.036
Road Width	64	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	1.392
Manning's N	0.017	Discharge (1/2 Q)	4.835

Depth: 0.236

RESULTS

HGL

Q_{100} FLOW CAPACITY = 9.67 cfs OK
at an HGL Depth= 0.24 ft < Curb height = 0.33
OK

EGL

Velocity 3.47 fps
$V^2/2g$ 0.19 ft
EGL Depth = 0.42 ft < Right-of-way height = 0.50
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Via Feliz (X2)** 7

LOCATION: **Alameda to Via Contenta**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0351	Road Width/2	32
Q_{100}	2	Curb Height	0.33
Right-of-way Width	82	1/2 Wetted Perimeter (P)	6.426
Road Width	64	1/2 Area(STD)	----
Curb Type	mtbl	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	0.397
Manning's N	0.017	Discharge (1/2 Q)	1.006

Depth 0.126

RESULTS

HGL

Q_{100} FLOW CAPACITY = 2.01 cfs OK

at an HGL Depth= 0.13 ft < Curb height = 0.33

OK

EGL

Velocity 2.54 fps

$V^2/2g$ 0.10 ft

EGL Depth = 0.23 ft < Right-of-way height = 0.50

OK

TABLE 5

STREET FLOW DEPTH SUMMARY - ALAMEDA BLVD NORTH SIDE

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{10} (X2) (cfs)	DEPTH (ft)	EGL DEPTH (ft)
Alameda Blvd - north	Sta 31+50 & up (X2)	60' F-F	std	0.0261	10.3	0.32	0.51
Alameda Blvd - north	Sta 30+00 to 31+50 (X2)	60' F-F	std	0.0381	22.7	0.39	0.75
Alameda Blvd - north	Sta 28+50 to 30+00 (X2)	60' F-F	std	0.0427	27	0.40	0.83
Alameda Blvd - north	Sta 27+00 28+50 (X2)	60' F-F	std	0.0377	1.9	0.19	0.30
Alameda Blvd - north	Sta 24+00 to 27+00 (X2)	60' F-F	std	0.0342	13	0.33	0.59
Alameda Blvd - north	Sta 18+00 to 24+00 (X2)(AP21)	60' F-F	std	0.0369	13	0.33	0.60
Alameda Blvd - north	Sta 16+00 to 18+00 (X2)	60' F-F	std	0.0223	6.6	0.29	0.42
Alameda Blvd - north	Sta 12+00 to 16+00 (X2)	60' F-F	std	0.0270	6.6	0.28	0.44
Alameda Blvd - north	Louisiana to Sta 12+00 (X2)	60' F-F	std	0.0261	6.6	0.28	0.43

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Alameda Blvd - north side** 1
LOCATION: **Sta 31+50 & up (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0261	Road Width/2	30
Q_{10} (X2)	10.3	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	12.223
Road Width	60	1/2 Area(STD)	1.501
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	5.201

Depth 0.323

RESULTS

HGL

Q_{10} FLOW CAPACITY = **10.40 cfs** OK
at an HGL Depth= **0.32 ft** < Curb height = 0.67
OK

EGL

Velocity 3.46 fps
$V^2/2g$ 0.19 ft
EGL Depth = **0.51 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - north side** 2
LOCATION: **Sta 30+00 to 31+50 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0381	Road Width/2	30
Q_{10} (X2)	22.7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	15.436
Road Width	60	1/2 Area(STD)	2.350
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	11.361

Depth 0.386

RESULTS

HGL

Q_{10} FLOW CAPACITY = **22.72 cfs** OK
at an HGL Depth= **0.39 ft** < Curb height = 0.67
OK

EGL

Velocity 4.83 fps
$V^2/2g$ 0.36 ft
EGL Depth = **0.75 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - north side** 3
LOCATION: **Sta 28+50 to 30+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0427	Road Width/2	30
Q_{10} (X2)	27	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	16.150
Road Width	60	1/2 Area(STD)	2.566
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	13.510

Depth 0.400

RESULTS

HGL

Q_{10} FLOW CAPACITY = **27.02 cfs** OK
at an HGL Depth= **0.40 ft** < Curb height = 0.67
OK

EGL

Velocity 5.27 fps
$V^2/2g$ 0.43 ft
EGL Depth = **0.83 ft** < Right-of-way height = 1.04
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME:	**Alameda Blvd - north side**	4
LOCATION:	**Sta 27+00 28+50 (X2)**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0377	Road Width/2	30
Q_{10} (X2)	1.9	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	5.338
Road Width	60	1/2 Area(STD)	0.350
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	0.958

Depth 0.188 3

RESULTS

HGL

Q_{10} FLOW CAPACITY = 1.92 cfs OK
at an HGL Depth= 0.19 ft < Curb height = 0.67
OK

EGL

Velocity 2.74 fps
$V^2/2g$ 0.12 ft
EGL Depth = 0.30 ft < Right-of-way height = 1.04
OK

STREET NAME:	**Alameda Blvd - north side**	5
LOCATION:	**Sta 24+00 to 27+00 (X2)**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0342	Road Width/2	30
Q_{10} (X2)	13	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	12.682
Road Width	60	1/2 Area(STD)	1.610
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	6.531

Depth 0.332

RESULTS

HGL

Q_{10} FLOW CAPACITY = 13.06 cfs OK
at an HGL Depth= 0.33 ft < Curb height = 0.67
OK

EGL

Velocity 4.06 fps
$V^2/2g$ 0.26 ft
EGL Depth = 0.59 ft < Right-of-way height = 1.04
OK

STREET NAME:	**Alameda Blvd - north side**	6
LOCATION:	**Sta 18+00 to 24+00 (X2)(AP21)**	

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0369	Road Width/2	30
Q_{10} (X2)	13	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	12.478
Road Width	60	1/2 Area(STD)	1.561
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	6.513

Depth 0.328

RESULTS

HGL

Q_{10} FLOW CAPACITY = 13.03 cfs OK
at an HGL Depth= 0.33 ft < Curb height = 0.67
OK

EGL

Velocity 4.17 fps
$V^2/2g$ 0.27 ft
EGL Depth = 0.60 ft < Right-of-way height = 1.04
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Alameda Blvd - north side** 7
LOCATION: **Sta 16+00 to 18+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0223	Road Width/2	30
Q_{10} (X2)	6.6	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	10.540
Road Width	60	1/2 Area(STD)	1.136
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	3.332

Depth 0.290

RESULTS

HGL

Q_{10} FLOW CAPACITY =	**6.66 cfs**	OK		
at an HGL Depth=	**0.29 ft**	<	Curb height =	0.67
		OK		

EGL

Velocity	2.93 fps			
$V^2/2g$	0.13 ft			
EGL Depth =	**0.42 ft**	<	Right-of-way height =	1.04
		OK		

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STREET NAME: **Alameda Blvd - north side** 8
LOCATION: **Sta 12+00 to 16+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.027	Road Width/2	30
Q_{10} (X2)	6.6	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	10.132
Road Width	60	1/2 Area(STD)	1.055
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	3.330

Depth 0.282

RESULTS

HGL

Q_{10} FLOW CAPACITY =	**6.66 cfs**	OK		
at an HGL Depth=	**0.28 ft**	<	Curb height =	0.67
		OK		

EGL

Velocity	3.16 fps			
$V^2/2g$	0.15 ft			
EGL Depth =	**0.44 ft**	<	Right-of-way height =	1.04
		OK		

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STREET NAME: **Alameda Blvd - north side** 9
LOCATION: **Louisiana to Sta 12+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0261	Road Width/2	30
Q_{10} (X2)	6.6	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	10.183
Road Width	60	1/2 Area(STD)	1.065
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	3.314

Depth 0.283

RESULTS

HGL

Q_{10} FLOW CAPACITY =	**6.63 cfs**	OK		
at an HGL Depth=	**0.28 ft**	<	Curb height =	0.67
		OK		

EGL

Velocity	3.11 fps			
$V^2/2g$	0.15 ft			
EGL Depth =	**0.43 ft**	<	Right-of-way height =	1.04
		OK		

TABLE 6

STREET FLOW DEPTH SUMMARY - ALAMEDA BLVD SOUTH SIDE

STREET	LOCATION	STREET WIDTH	CURB TYPE	SLOPE (ft/ft)	Q_{10} (X2) (cfs)	DEPTH (ft)	EGL DEPTH (ft)
Alameda Blvd - soutl	Sta 31+50 & up (X2)	60' F-F	std	0.0261	19.3	0.39	0.64
Alameda Blvd - soutl	Sta 30+00 to 31+50 (x2)	60' F-F	std	0.0381	22.7	0.39	0.75
Alameda Blvd - soutl	Sta 28+50 to 30+00 (X2)	60' F-F	std	0.0427	22.7	0.38	0.78
Alameda Blvd - soutl	Sta 27+00 28+50	60' F-F	std	0.0377	22.7	0.39	0.75
Alameda Blvd - soutl	Sta 24+00 to 27+00 (X2)	60' F-F	std	0.0342	7	0.28	0.47
Alameda Blvd - soutl	Sta 18+00 to 24+00 (AP21) (X2	60' F-F	std	0.0369	7	0.27	0.48
Alameda Blvd - soutl	Sta 16+00 to 18+00 (X2)	60' F-F	std	0.0223	11.4	0.34	0.51
Alameda Blvd - soutl	Sta 12+00 to 16+00 (X2)	60' F-F	std	0.0270	14.2	0.35	0.58
Alameda Blvd - soutl	Louisiana to Sta 12+00	60' F-F	std	0.0261	10.4	0.32	0.51

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Alameda Blvd - south side** 1
LOCATION: **Sta 31+50 & up (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0261	Road Width/2	30
Q_{10} (X2)	19.3	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	15.640
Road Width	60	1/2 Area(STD)	2.411
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	9.725

Depth 0.390

RESULTS

HGL

Q10 FLOW CAPACITY = 19.45 cfs OK
at an HGL Depth= 0.39 ft < Curb height = 0.67
OK

EGL

Velocity 4.03 fps
$V^2/2g$ 0.25 ft
EGL Depth = 0.64 ft < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 2
LOCATION: **Sta 30+00 to 31+50 (x2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0381	Road Width/2	30
Q_{10} (X2)	22.7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	15.436
Road Width	60	1/2 Area(STD)	2.350
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	11.361

Depth 0.386

RESULTS

HGL

Q10 FLOW CAPACITY = 22.72 cfs OK
at an HGL Depth= 0.39 ft < Curb height = 0.67
OK

EGL

Velocity 4.83 fps
$V^2/2g$ 0.36 ft
EGL Depth = 0.75 ft < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 3
LOCATION: **Sta 28+50 to 30+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0427	Road Width/2	30
Q_{10} (X2)	22.7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	15.130
Road Width	60	1/2 Area(STD)	2.261
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	11.425

Depth 0.380

RESULTS

HGL

Q10 FLOW CAPACITY = 22.85 cfs OK
at an HGL Depth= 0.38 ft < Curb height = 0.67
OK

EGL

Velocity 5.05 fps
$V^2/2g$ 0.40 ft
EGL Depth = 0.78 ft < Right-of-way height = 1.04
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Alameda Blvd - south side** 4
LOCATION: **Sta 27+00 28+50**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0377	Road Width/2	30
Q_{10} (X2)	22.7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	15.487
Road Width	60	1/2 Area(STD)	2.365
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0 017	Discharge (1/2 Q)	11.397

Depth 0.387

RESULTS

HGL

Q10 FLOW CAPACITY = **22.79 cfs** OK
at an HGL Depth= **0.39 ft** < Curb height = 0.67
OK

EGL

Velocity 4.82 fps
$V^2/2g$ 0.36 ft
EGL Depth = **0.75 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 5
LOCATION: **Sta 24+00 to 27+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0342	Road Width/2	30
Q_{10} (X2)	7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	9.877
Road Width	60	1/2 Area(STD)	1.007
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	3.523

Depth 0.277

RESULTS

HGL

Q10 FLOW CAPACITY = **7.05 cfs** OK
at an HGL Depth= **0.28 ft** < Curb height = 0.67
OK

EGL

Velocity 3.50 fps
$V^2/2g$ 0.19 ft
EGL Depth = **0.47 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 6
LOCATION: **Sta 18+00 to 24+00 (AP21) (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0369	Road Width/2	30
Q_{10} (X2)	7	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	9.724
Road Width	60	1/2 Area(STD)	0.978
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	3.525

Depth 0.274

RESULTS

HGL

Q10 FLOW CAPACITY = **7.05 cfs** OK
at an HGL Depth= **0.27 ft** < Curb height = 0.67
OK

EGL

Velocity 3.60 fps
$V^2/2g$ 0.20 ft
EGL Depth = **0.48 ft** < Right-of-way height = 1.04
OK

STREET FLOW CAPACITY CALCULATIONS

STREET NAME: **Alameda Blvd - south side** 7
LOCATION: **Sta 16+00 to 18+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0223	Road Width/2	30
Q_{10} (X2)	11.4	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	13.090
Road Width	60	1/2 Area(STD)	1.711
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	5.711

Depth 0.340

RESULTS

HGL

Q10 FLOW CAPACITY = **11.42 cfs** OK
at an HGL Depth= **0.34 ft** < Curb height = 0.67
OK

EGL

Velocity 3.34 fps
$V^2/2g$ 0.17 ft
EGL Depth = **0.51 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 8
LOCATION: **Sta 12+00 to 16+00 (X2)**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.027	Road Width/2	30
Q_{10} (X2)	14.2	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	13.753
Road Width	60	1/2 Area(STD)	1.881
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	7.122

Depth 0.353

RESULTS

HGL

Q10 FLOW CAPACITY = **14.24 cfs** OK
at an HGL Depth= **0.35 ft** < Curb height = 0.67
OK

EGL

Velocity 3.79 fps
$V^2/2g$ 0.22 ft
EGL Depth = **0.58 ft** < Right-of-way height = 1.04
OK

STREET NAME: **Alameda Blvd - south side** 9
LOCATION: **Louisiana to Sta 12+00**

STREET INFORMATION		HALF STREET CALCULATIONS	
Slope	0.0261	Road Width/2	30
Q_{10} (X2)	10.4	Curb Height	0.67
Right-of-way Width	98	1/2 Wetted Perimeter (P)	12.223
Road Width	60	1/2 Area(STD)	1.501
Curb Type	std	1/2 Area(MDN)	----
Road Cross Slope	0.02	1/2 Area(MTBL)	----
Manning's N	0.017	Discharge (1/2 Q)	5.201

Depth 0.323

RESULTS

HGL

Q10 FLOW CAPACITY = **10.40 cfs** OK
at an HGL Depth= **0.32 ft** < Curb height = 0.67
OK

EGL

Velocity 3.46 fps
$V^2/2g$ 0.19 ft
EGL Depth = **0.51 ft** < Right-of-way height = 1.04
OK

Hydraflow Storm Sewer Tabulation

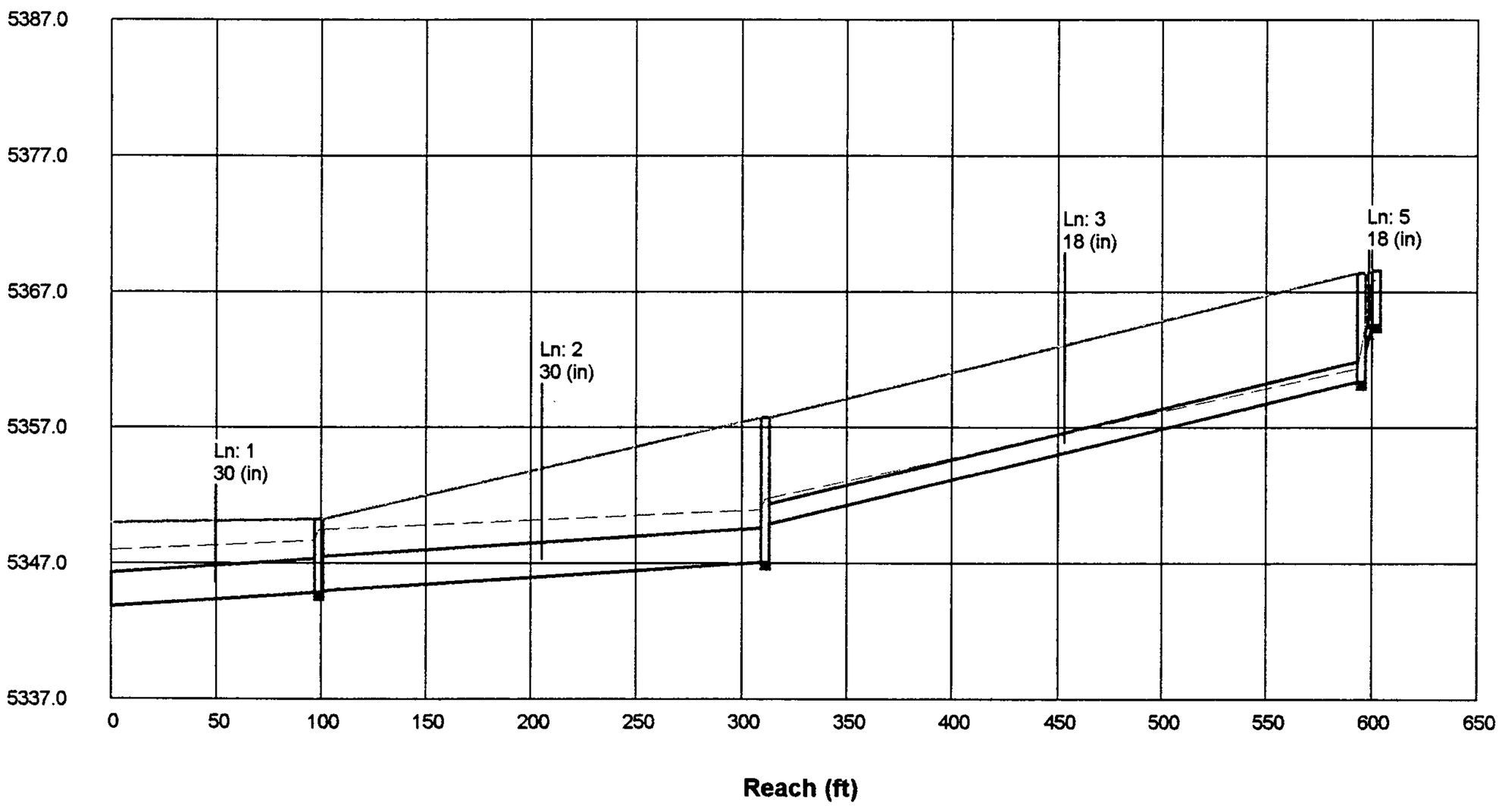
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	99.0	0.00	0.00	0.00	0.00	0.00	0.0	2.1	0.0	34.48	41.02	7.02	30	1.00	5344.85	5343.86	5348.70	5348.00	5350.27	5350.00	connect to exist
2	1	212.0	0.00	0.00	0.00	0.00	0.00	0.0	1.6	0.0	34.48	40.82	7.02	30	0.99	5347.10	5345.00	5350.97	5349.47	5357.77	5350.27	Via Contenta
3	2	284.0	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	6.54	20.19	4.54	18	3.70	5360.40	5349.90	5361.38	5351.73	5368.41	5357.77	Via Contenta
4	3	24.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.27	35.55	3.08	18	11.46	5363.30	5360.55	5363.99	5361.82	5368.80	5368.41	Via Contenta con
5	3	7.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.27	56.13	9.14	18	28.57	5364.60	5362.60	5367.86	5362.85	5368.60	5368.41	Via Contenta con
6	2	153.0	0.00	0.00	0.00	0.00	0.00	0.0	1.3	0.0	27.94	21.25	8.89	24	0.88	5348.60	5347.25	5354.07	5351.73	5356.63	5357.77	Via Feliz
7	6	78.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.92	16.35	3.35	18	2.42	5351.99	5350.10	5355.55	5355.30	5358.49	5356.63	Alameda connect
8	6	54.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.92	19.65	3.35	18	3.50	5351.99	5350.10	5355.47	5355.30	5358.49	5356.63	Alameda connect
9	6	577.0	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	16.10	19.87	9.19	18	3.58	5369.40	5348.75	5370.83	5355.30	5377.43	5356.63	Alameda
10	9	65.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	8.05	11.65	5.95	18	1.23	5371.70	5370.90	5372.78	5371.96	5387.17	5377.43	Alameda connect
11	9	31.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	8.05	16.87	5.95	18	2.58	5371.70	5370.90	5372.78	5371.96	5387.17	5377.43	Alameda connect

Project File: 1257-Eagle Springs extension.stm | IDF File: sampleFHA.IDF | Total number of lines: 11 | Run Date: 05-28-2003

NOTES: Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; Initial tailwater elevation = 5348.00 (ft)

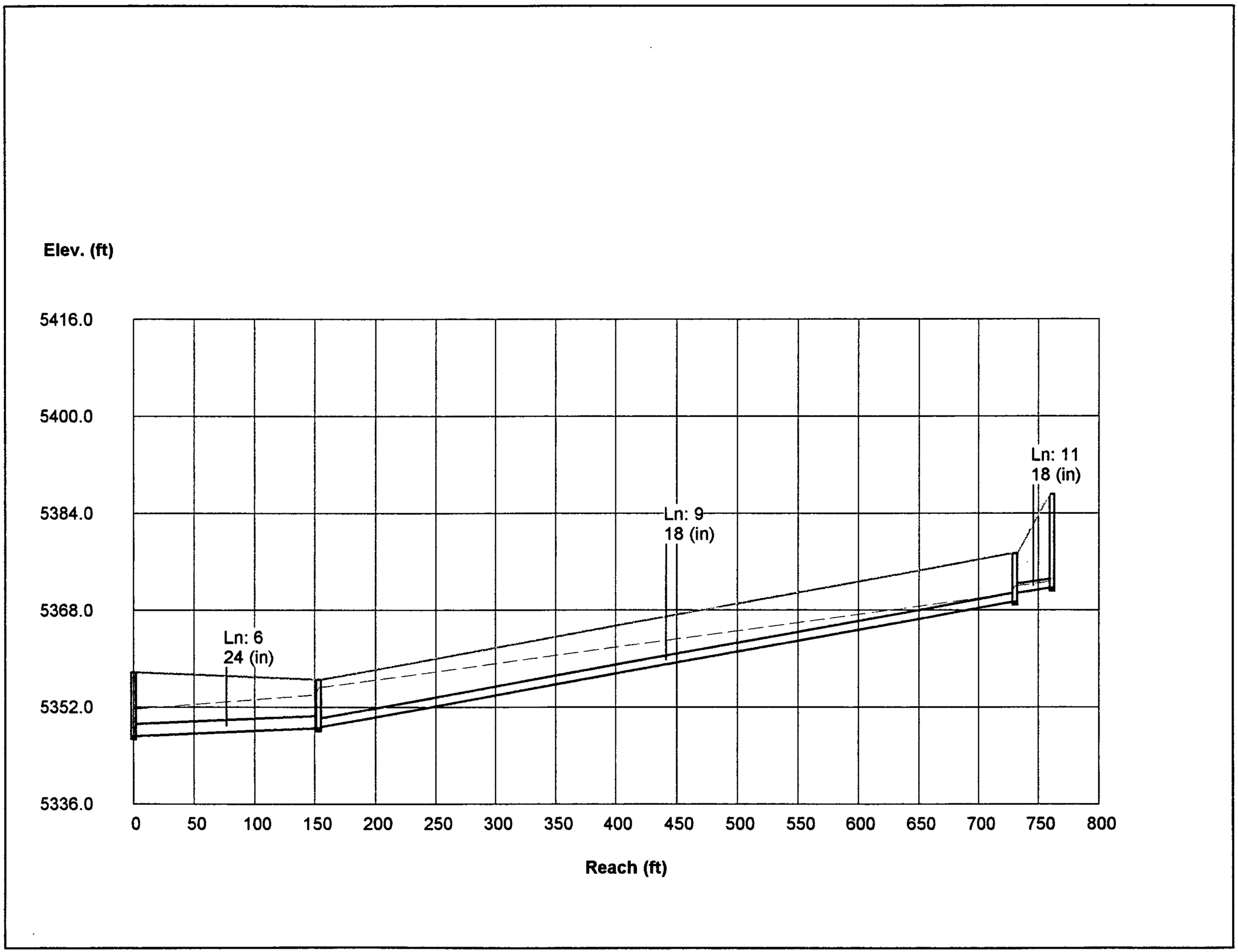
Storm Sewer Profile

Proj. file: 1257-Eagle Springs extension.stm



Storm Sewer Profile

Proj. file: 1257-Eagle Springs extension.stm



Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	100.0	0.00	0.00	0.00	0.00	0.00	0.0	3.4	0.0	72.60	121.9	14.79	30	8.84	5300.10	5291.26	5305.64	5302.50	5308.06	5303.50	Retention Pond
2	1	186.0	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	57.74	65.88	11.76	30	2.58	5305.00	5300.20	5309.32	5305.64	5313.05	5308.06	Alameda
3	2	403.0	0.00	0.00	0.00	0.00	0.00	0.0	2.5	0.0	57.74	65.50	11.87	30	2.55	5315.38	5305.10	5317.76	5309.32	5323.28	5313.05	Alameda
4	3	202.0	0.00	0.00	0.00	0.00	0.00	0.0	2.0	0.0	34.91	40.85	11.19	24	3.26	5321.97	5315.38	5323.89	5317.76	5329.97	5323.28	Alameda
5	4	72.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.55	22.21	4.08	18	4.47	5325.29	5322.07	5326.19	5323.89	5331.06	5329.97	Alameda connect
6	4	43.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.55	34.79	4.08	18	10.98	5326.79	5322.07	5327.69	5323.89	5331.06	5329.97	Alameda connect
7	4	148.0	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	23.81	26.88	8.01	24	1.41	5324.11	5322.02	5325.84	5323.89	5329.11	5329.97	Via de Paz
8	7	52.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.65	9.44	3.89	18	0.81	5324.68	5324.26	5326.01	5325.84	5327.77	5329.11	Via de Paz conne
9	7	173.0	0.00	0.00	0.00	0.00	0.00	0.0	1.4	0.0	17.16	16.11	9.71	18	2.35	5328.33	5324.26	5330.46	5325.84	5336.70	5329.11	Via Contenta
10	9	36.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.02	19.65	3.35	18	3.50	5329.74	5328.48	5330.51	5330.46	5338.03	5336.70	Via Contenta con
11	9	11.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.02	22.62	2.28	18	4.64	5328.99	5328.48	5330.48	5330.46	5336.95	5336.70	Via Contenta con
12	9	396.0	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	9.12	20.67	5.71	18	3.88	5343.78	5328.43	5344.93	5330.46	5351.63	5336.70	Via Contenta
13	12	18.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.56	32.93	4.14	18	9.83	5345.70	5343.93	5346.52	5344.93	5351.81	5351.63	Via Contenta con
14	12	20.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.56	31.24	4.14	18	8.85	5345.70	5343.93	5346.52	5344.93	5352.26	5351.63	Via Contenta con
15	1	61.0	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	14.86	16.13	4.73	24	0.51	5300.56	5300.25	5305.90	5305.64	5307.83	5308.06	Eagle Feather co
16	15	39.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.49	18.72	5.94	18	3.18	5302.30	5301.06	5306.29	5305.90	5307.07	5307.83	Eagle Feather co
17	3	99.0	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	22.83	29.15	5.07	30	0.51	5315.93	5315.43	5317.96	5317.76	5321.80	5323.28	Dancing Eagle Ct
18	17	79.0	0.00	0.00	0.00	0.00	0.00	0.0	1.9	0.0	18.04	15.89	5.74	24	0.49	5316.67	5316.28	5318.78	5318.28	5322.83	5321.80	Dancing Eagle Ct
19	18	98.0	0.00	0.00	0.00	0.00	0.00	0.0	1.8	0.0	18.04	16.02	10.21	18	2.33	5319.10	5316.82	5321.68	5318.78	5327.10	5322.83	Dancing Eagle Av
20	19	22.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.76	21.36	2.69	18	4.14	5320.16	5319.25	5321.72	5321.68	5327.70	5327.10	Dancing Eagle co
21	19	11.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.76	52.51	3.71	18	25.00	5322.00	5319.25	5322.83	5321.68	5327.54	5327.10	Dancing Eagle co

Project File: 1257-Louis prop.stm | IDF File: sampleFHA.IDF | Total number of lines: 24 | Run Date: 05-28-2003

NOTES: Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; Initial tailwater elevation = 5302.50 (ft)

Hydraflow Storm Sewer Tabulation

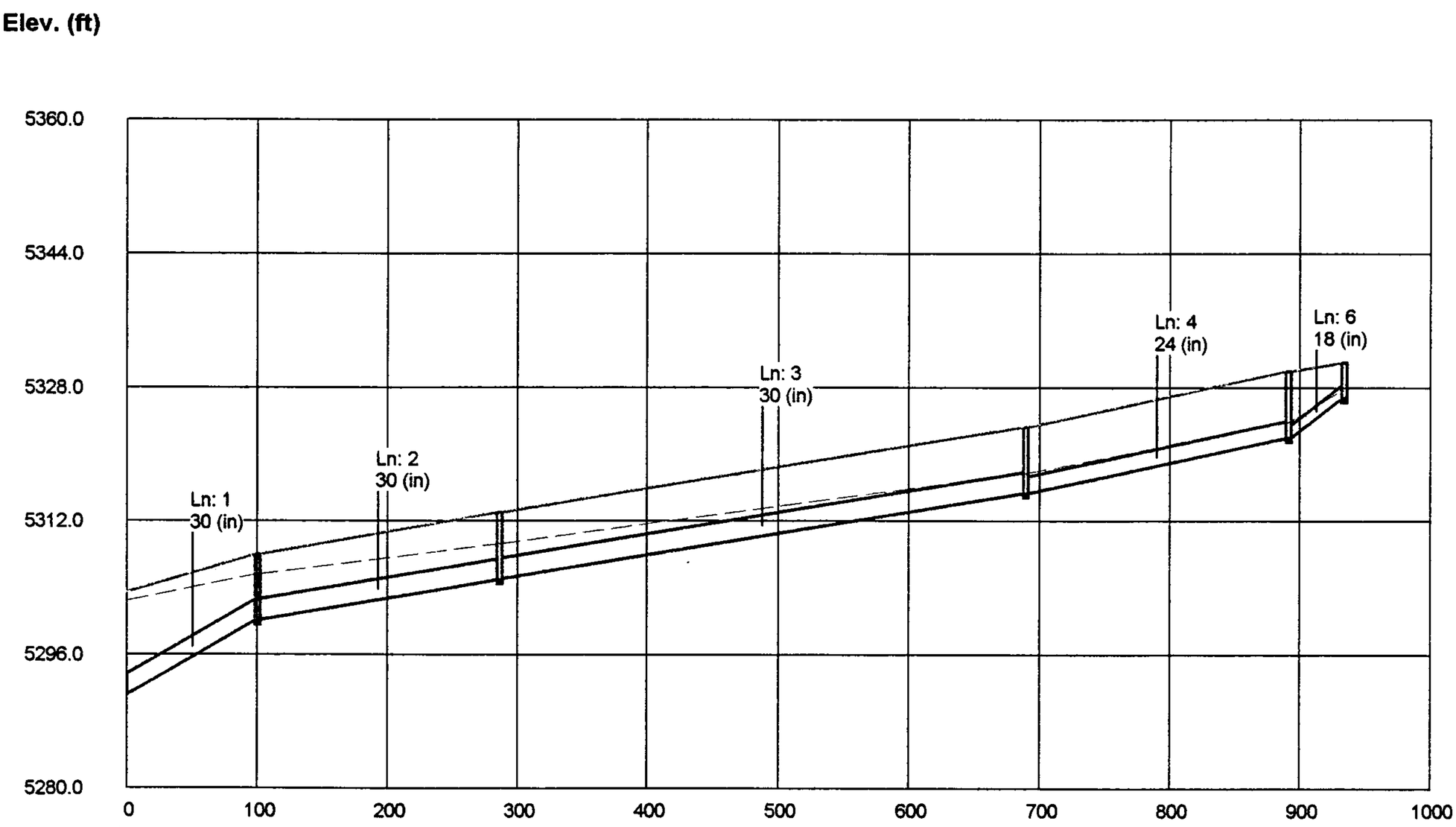
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
22	19	455.0	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	8.52	20.09	5.44	18	3.66	5335.86	5319.20	5336.97	5321.68	5343.14	5327.10	Dancing Eagle Av
23	22	31.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.26	16.23	4.04	18	2.39	5336.75	5336.01	5337.54	5336.97	5344.05	5343.14	Dancing Eagle co
24	22	7.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.26	62.51	4.04	18	35.44	5338.49	5336.01	5339.28	5336.97	5343.26	5343.14	Dancing Eagle co

Project File: 1257-Louis prop.stm | IDF File: sampleFHA.IDF | Total number of lines: 24 | Run Date: 05-28-2003

NOTES: Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; Initial tailwater elevation = 5302.50 (ft)

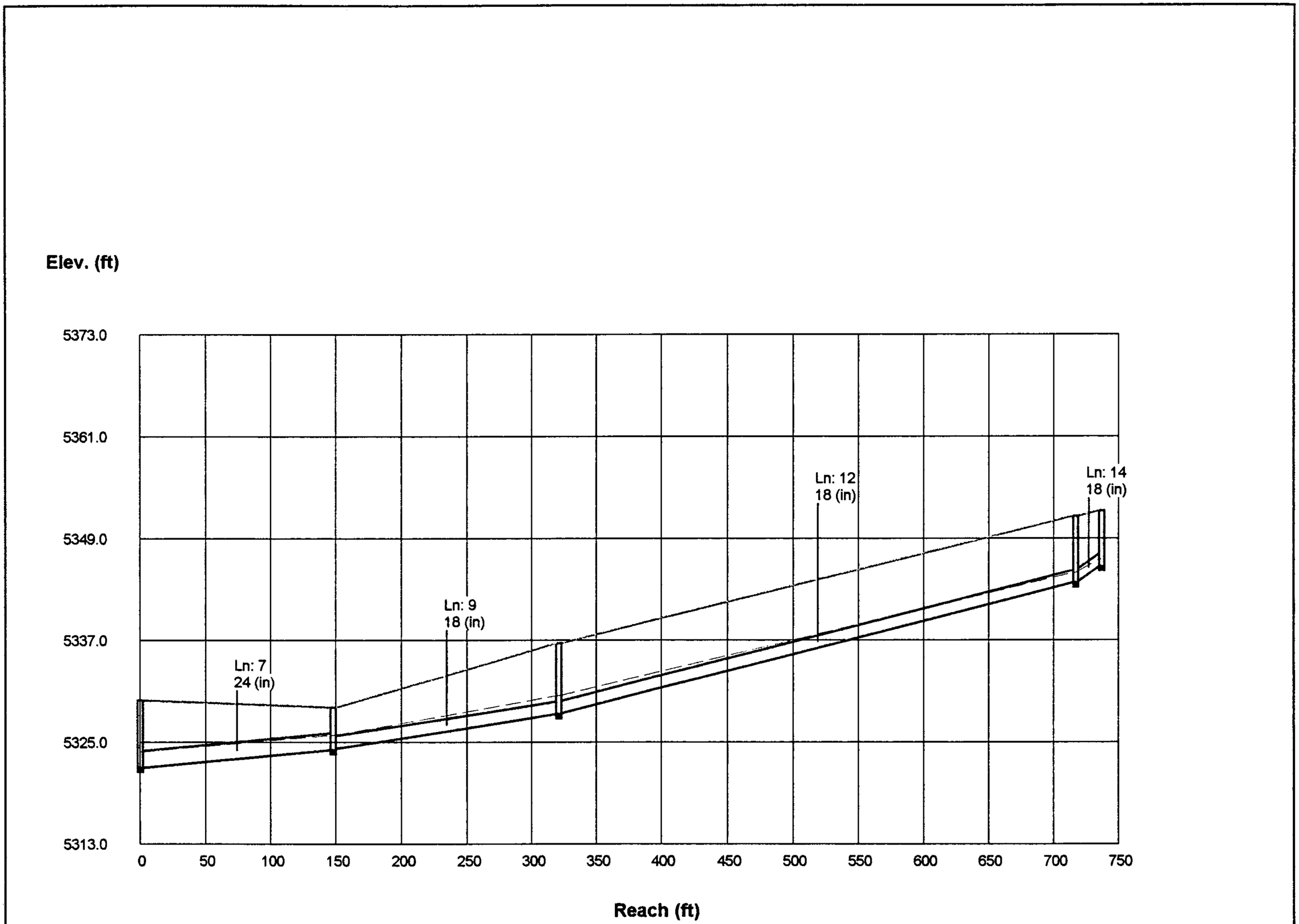
Storm Sewer Profile

Proj. file: 1257-Louis prop.stm



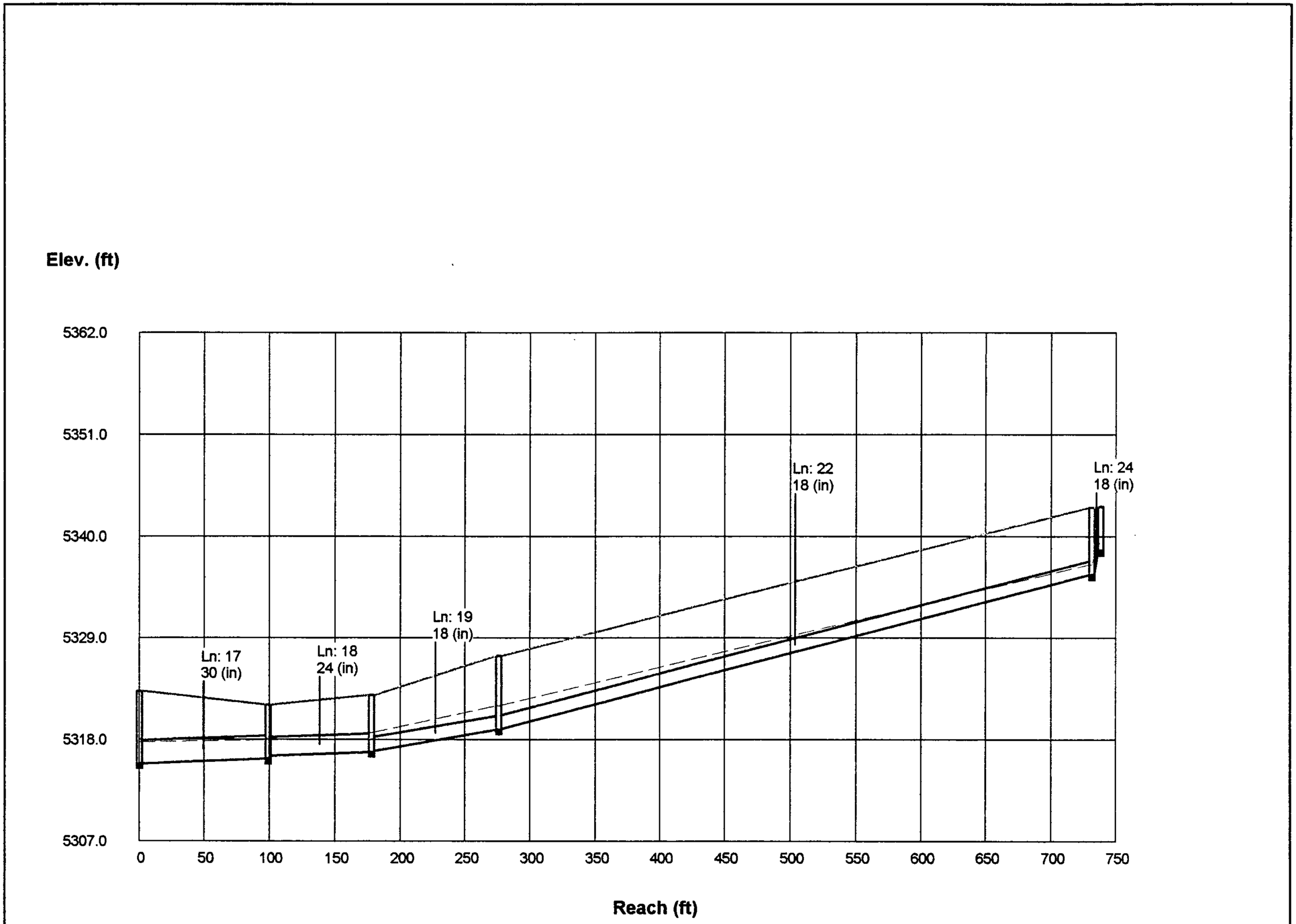
Storm Sewer Profile

Proj. file: 1257-Louis prop.stm



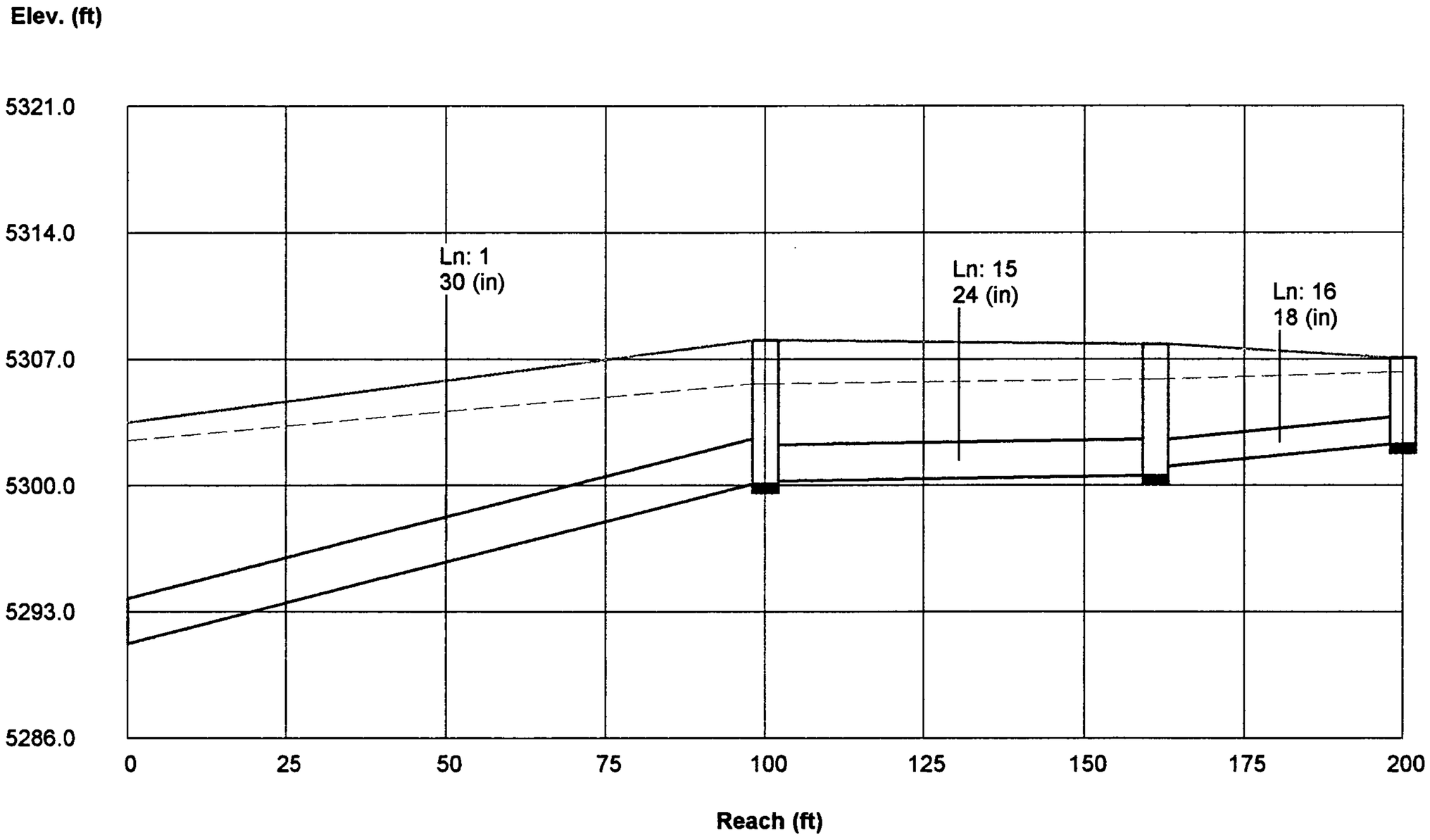
Storm Sewer Profile

Proj. file: 1257-Louis prop.stm



Storm Sewer Profile

Proj. file: 1257-Louis prop.stm



Hydraflow Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
1	End	153.0	0.00	0.00	0.00	0.00	0.00	0.0	3.3	0.0	96.57	160.3	13.66	36	5.78	5300.10	5291.26	5305.71	5302.50	5308.06	5303.50	Alameda & Louisi
2	1	186.0	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	69.57	65.88	14.17	30	2.58	5305.00	5300.20	5311.06	5305.71	5313.05	5308.06	Alameda
3	2	403.0	0.00	0.00	0.00	0.00	0.00	0.0	2.5	0.0	57.74	65.50	11.76	30	2.55	5315.38	5305.10	5319.06	5311.06	5323.28	5313.05	Alameda
4	3	202.0	0.00	0.00	0.00	0.00	0.00	0.0	2.0	0.0	34.91	40.85	11.19	24	3.26	5321.97	5315.38	5323.89	5319.06	5329.97	5323.28	Alameda
5	4	72.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.55	22.21	4.08	18	4.47	5325.29	5322.07	5326.19	5323.89	5331.06	5329.97	Alameda connect
6	4	43.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.55	34.79	4.08	18	10.98	5326.79	5322.07	5327.69	5323.89	5331.06	5329.97	Alameda connect
7	4	148.0	0.00	0.00	0.00	0.00	0.00	0.0	1.7	0.0	23.81	26.88	8.01	24	1.41	5324.11	5322.02	5325.84	5323.89	5329.11	5329.97	Via de Paz
8	7	52.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.65	9.44	3.89	18	0.81	5324.68	5324.26	5326.01	5325.84	5327.77	5329.11	Via de Paz conne
9	7	173.0	0.00	0.00	0.00	0.00	0.00	0.0	1.4	0.0	17.16	16.11	9.71	18	2.35	5328.33	5324.26	5330.46	5325.84	5336.70	5329.11	Via Contenta
10	9	36.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.02	19.65	3.35	18	3.50	5329.74	5328.48	5330.51	5330.46	5338.03	5336.70	Via Contenta con
11	9	11.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.02	22.62	2.28	18	4.64	5328.99	5328.48	5330.48	5330.46	5336.95	5336.70	Via Contenta con
12	9	396.0	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	9.12	20.67	5.71	18	3.88	5343.78	5328.43	5344.93	5330.46	5351.63	5336.70	Via Contenta
13	12	18.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.56	32.93	4.14	18	9.83	5345.70	5343.93	5346.52	5344.93	5351.81	5351.63	Via Contenta con
14	12	20.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.56	31.24	4.14	18	8.85	5345.70	5343.93	5346.52	5344.93	5352.26	5351.63	Via Contenta con
15	1	61.0	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	14.86	16.13	4.73	24	0.51	5300.56	5300.25	5305.97	5305.71	5307.83	5308.06	Eagle Feather co
16	15	39.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	10.49	18.72	5.94	18	3.18	5302.30	5301.06	5306.36	5305.97	5307.07	5307.83	Eagle Feather co
17	1	23.0	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	12.14	36.71	6.87	18	12.22	5303.06	5300.25	5306.02	5305.71	5308.06	5308.06	Alameda connect
18	3	99.0	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	22.83	29.15	4.65	30	0.51	5315.93	5315.43	5319.36	5319.06	5321.80	5323.28	Dancing Eagle Ct
19	18	79.0	0.00	0.00	0.00	0.00	0.00	0.0	1.9	0.0	18.04	15.89	5.74	24	0.49	5316.67	5316.28	5319.87	5319.36	5322.83	5321.80	Dancing Eagle Ct
20	19	98.0	0.00	0.00	0.00	0.00	0.00	0.0	1.8	0.0	18.04	16.02	10.21	18	2.33	5319.10	5316.82	5322.76	5319.87	5327.10	5322.83	Dancing Eagle Av
21	20	22.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.76	21.36	2.69	18	4.14	5320.16	5319.25	5322.80	5322.76	5327.70	5327.10	Dancing Eagle co

Project File: 1257-Louis future.stm | IDF File: sampleFHA.IDF | Total number of lines: 27 | Run Date: 05-28-2003

NOTES: Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; Initial tailwater elevation = 5302.50 (ft)

Hydraflow Storm Sewer Tabulation

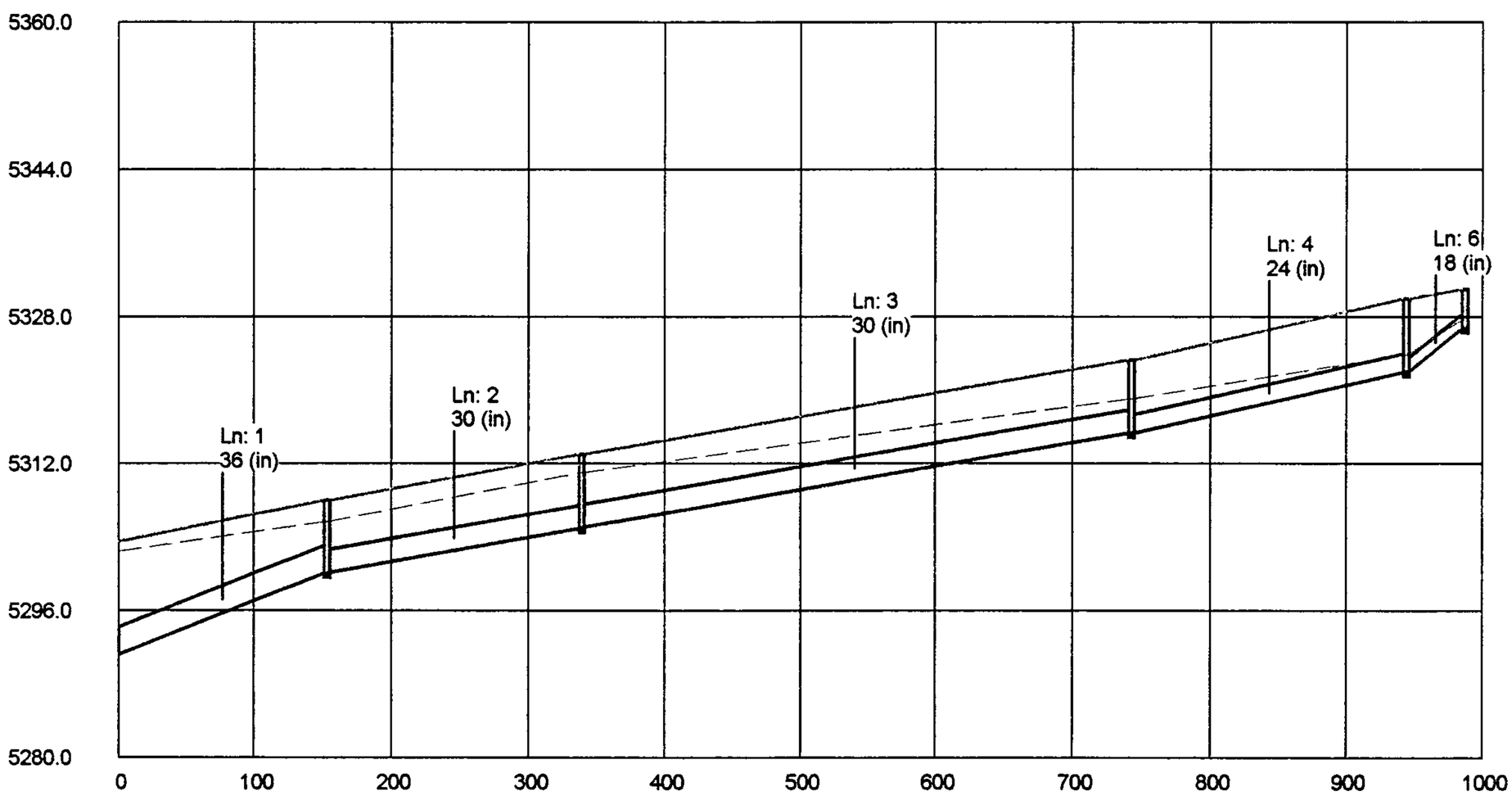
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	
22	20	11.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.76	52.51	3.71	18	25.00	5322.00	5319.25	5322.83	5322.76	5327.54	5327.10	Dancing Eagle co
23	20	455.0	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	8.52	20.09	5.44	18	3.66	5335.86	5319.20	5336.97	5322.76	5343.14	5327.10	Dancing Eagle Av
24	23	31.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.26	16.23	4.04	18	2.39	5336.75	5336.01	5337.54	5336.97	5344.05	5343.14	Dancing Eagle co
25	23	7.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.26	62.51	4.04	18	35.44	5338.49	5336.01	5339.28	5336.97	5343.26	5343.14	Dancing Eagle co
26	17	50.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	7.77	21.00	5.10	18	4.00	5305.60	5303.60	5306.66	5306.02	5309.00	5308.06	Future Lots 1&2 c
27	2	23.0	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.83	42.96	6.70	18	16.74	5309.00	5305.15	5311.36	5311.06	5313.05	5313.05	Future Lots 3-5 c

Project File: 1257-Louis future.stm | IDF File: sampleFHA.IDF | Total number of lines: 27 | Run Date: 05-28-2003

NOTES: Intensity = 127.16 / (Inlet time + 17.80) ^ 0.82; Return period = 100 Yrs. ; Initial tailwater elevation = 5302.50 (ft)

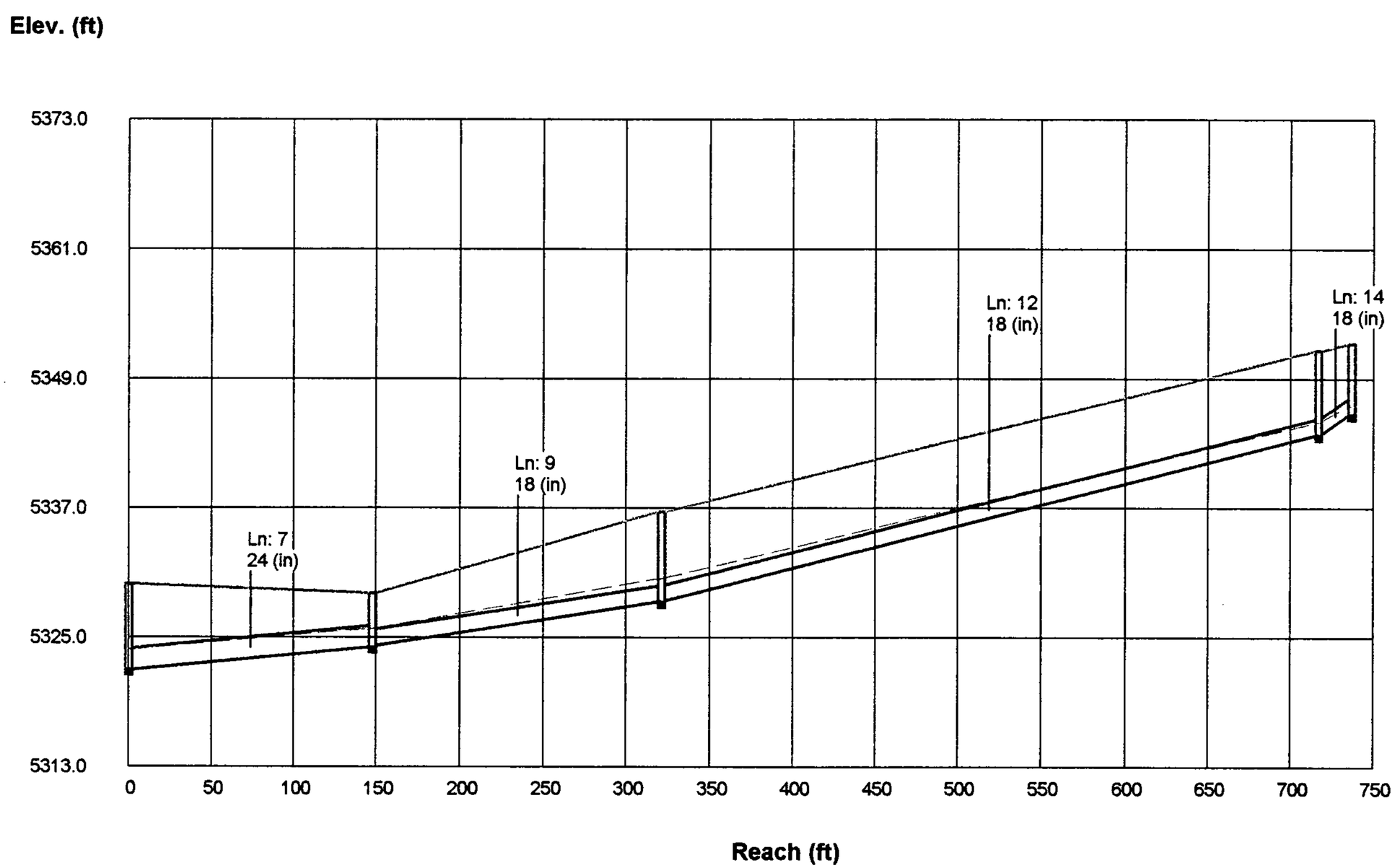
Storm Sewer Profile

Proj. file: 1257-Louis future.stm



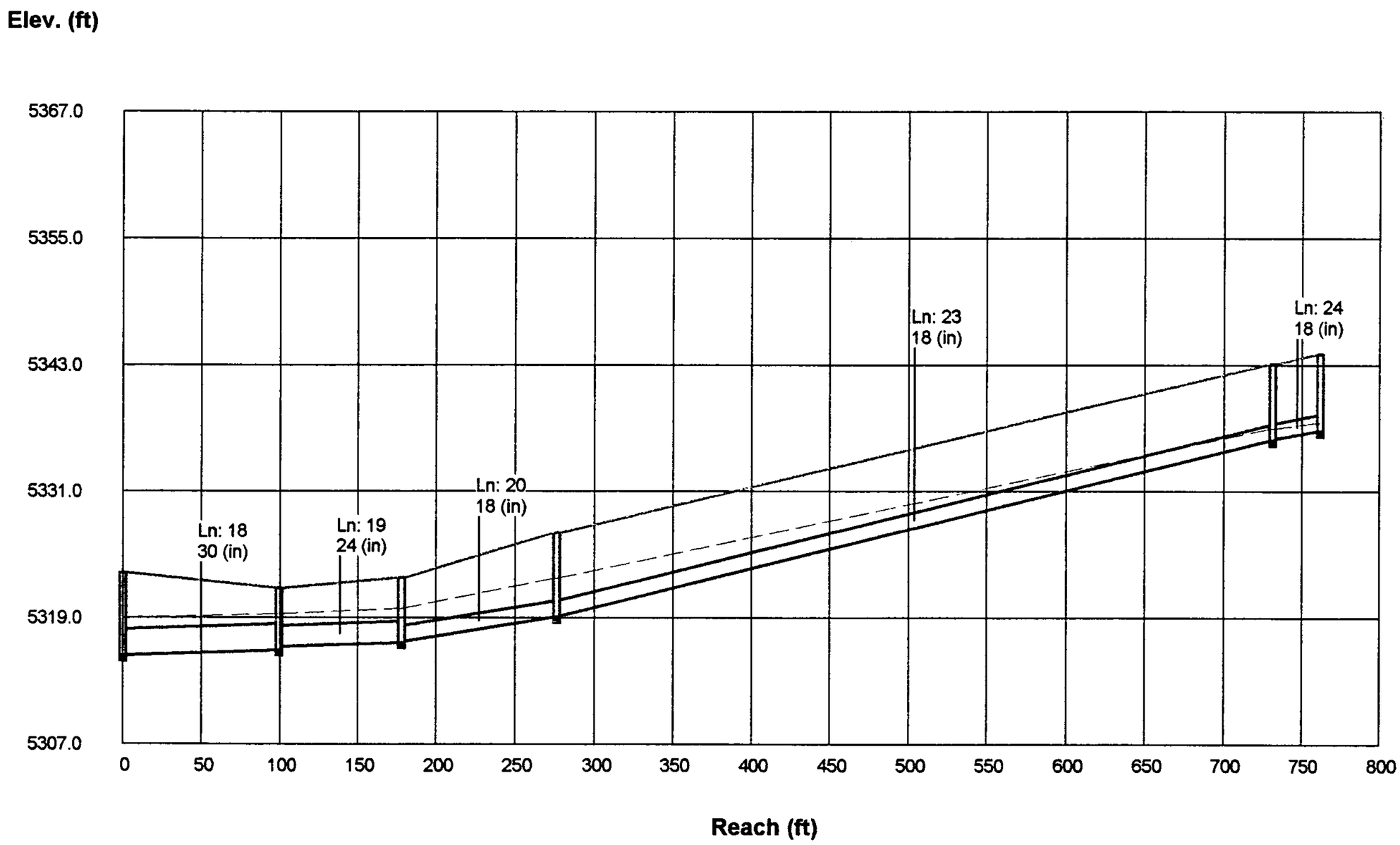
Storm Sewer Profile

Proj. file: 1257-Louis future.stm



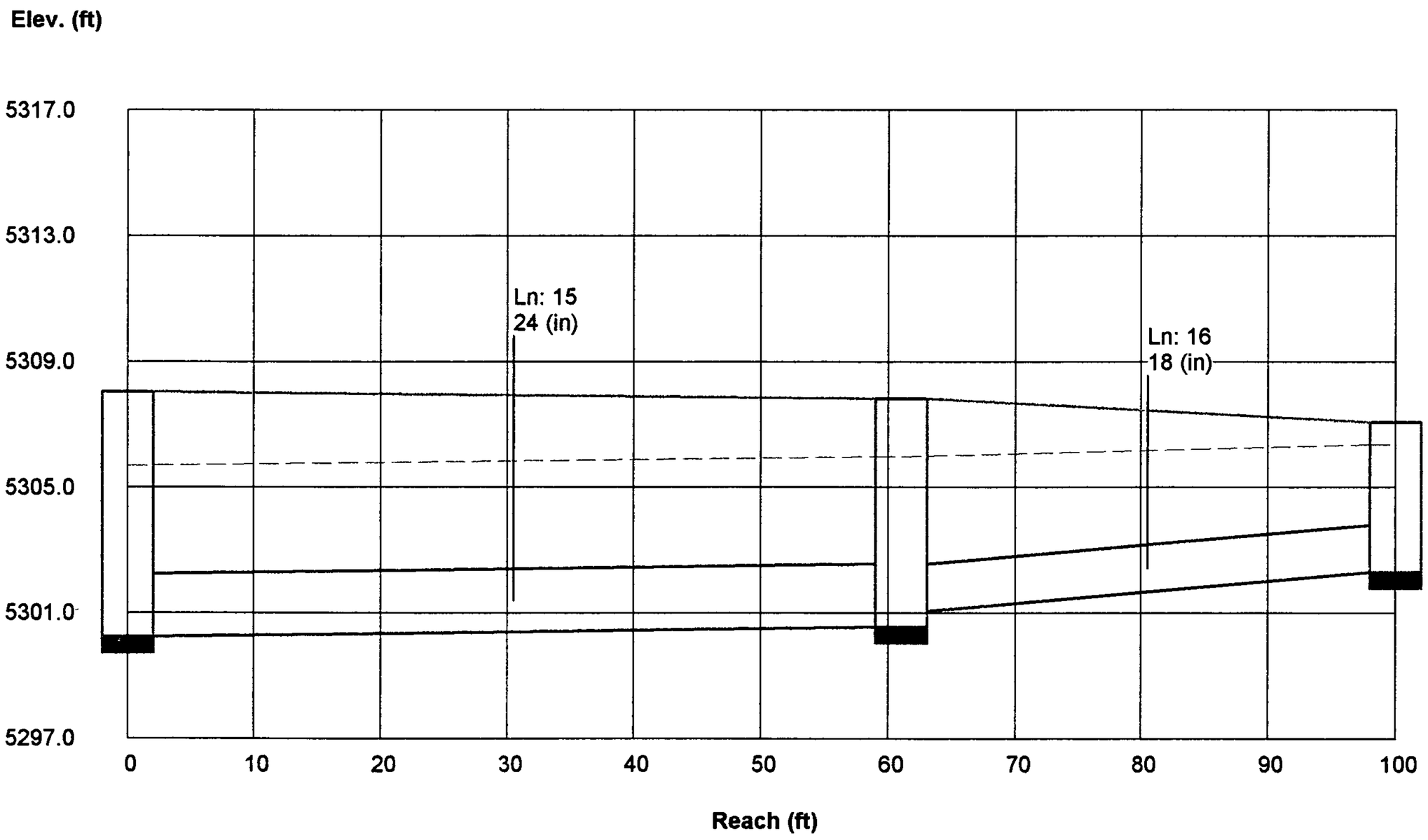
Storm Sewer Profile

Proj. file: 1257-Louis future.stm



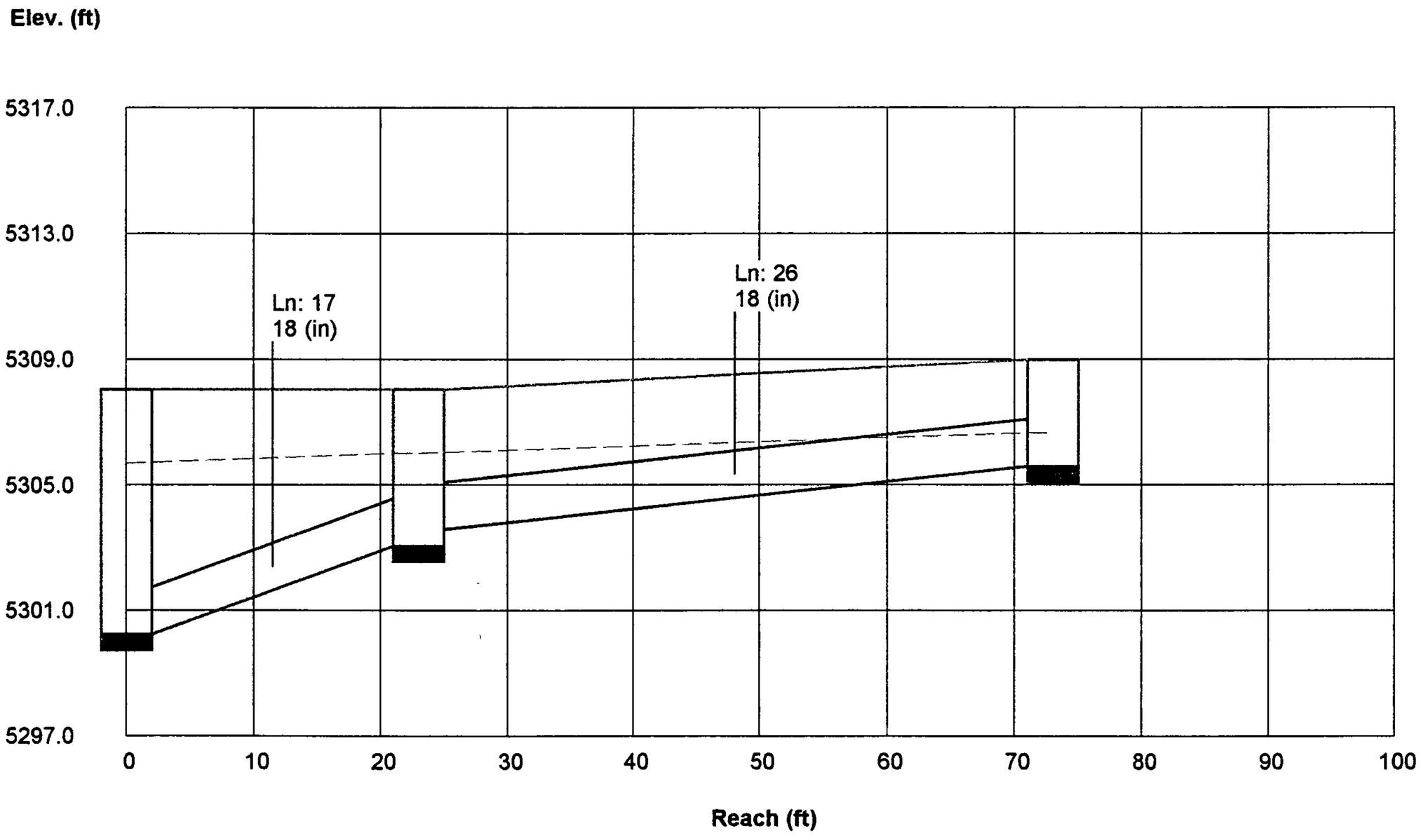
Storm Sewer Profile

Proj. file: 1257-Louis future.stm



Storm Sewer Profile

Proj. file: 1257-Louis future.stm



ANALYZE SUMP INLETS

GRATE OPEN AREA:
(per COA std dwg #2220, single grate)

GROSS AREA FOR ONE GRATE =	(25 in/12)(40 in/12) =	6.94 SF
LESS BEARING BARS =	(0.5 in/12)(3.33 ft)(13) =	1.80 SF
LESS CROSS BARS =	(0.5 in/12)(7)[(25 in/12)-(13)(0.5 in/12)] =	0.45 SF
	NET GRATE OPEN AREA =	**4.69 SF**
	GRATE OPEN AREA (assuming 50% clogging factor) =	***2.35 SF***

ORIFICE EQUATION:

$$Q = CA(2gh)^{1/2}$$

Where:

C = 0.67
A = 2.35 ft^2
g = 32.2 ft/sec^2
h = height of the water surface above the grate

CAPACITY CALCULATIONS:

INLET # 8
LOCATION: Via de Paz

h = 0.33 ft
$Q_{(capacity)}$ = 7.244593 cfs
REQUIRED Q = 13.3 cfs
(2 X 100 year storm)
NUMBER OF GRATES REQUIRED = **2**

INLET # 16
LOCATION: Eagle Feather Ct

h = 0.33 ft
$Q_{(capacity)}$ = 7.244593 cfs
REQUIRED Q = 20.98 cfs
(2 X 100 year storm)
NUMBER OF GRATES REQUIRED = **3**

INLET # 18
LOCATION: Dancing Eagle Ct

h = 0.33 ft
$Q_{(capacity)}$ = 7.244593 cfs
REQUIRED Q = 9.58 cfs
(2 X 100 year storm)
NUMBER OF GRATES REQUIRED = **2**

ANALYZE SUMP INLETS

INLET # 26
LOCATION: Future Lots 1 & 2

h = 0.5 ft
$Q_{(capacity)}$ = 8.917478 cfs

REQUIRED Q = 7.77 cfs

NUMBER OF GRATES REQUIRED = 1

INLET # 27
LOCATION: Future Lots 3 thru 5

h = 0.5 ft
$Q_{(capacity)}$ = 8.917478 cfs

REQUIRED Q = 11.83 cfs

NUMBER OF GRATES REQUIRED = 2