Cold Spring Ranch
Sewer

Design Criteria:

Minimum Pipe Size:	8”
Minimum Slope:	0.334%
Design Flow:	
Residential	100 gallons per person per day (UT R317-3-2.2.B.1) 3.8 capita / Dwelling Unit
Commercial	333 sq.ft. of building space / capita 15 gallons per person per day
Peak Factor	4.0

Summary of Results (Project Sizes):

Design Flow:	Flow:	Pipe Size Req’d
Pipe 1	1,735 gpm (peak)	15” @ 0.36% min. (24” MP)
Pipe 2	1,040 gpm (peak)	12” @ 0.43% min. (18” & 24” MP)
Pipe 3	280 gpm (peak)	8” @ 0.33% min. (18” MP)
Pipe 4	664 gpm (peak)	10” @ 0.46% min.
Pipe 5	482 gpm (peak)	8” @ 0.79% min.
Pipe 6	419 gpm (peak)	8” @ 0.60% min.
Pipe 7	50 gpm (peak)	8” @ 0.33% min.
Pipe 8	695 gpm (peak)	10” @ 0.50% min.
Pipe 9	513 gpm (peak)	8” @ 0.90% min.
Pipe 10	341 gpm (peak)	8” @ 0.40% min.
Pipe 11	205 gpm (peak)	8” @ 0.33% min.
Pipe 12	37 gpm (peak)	8” @ 0.33% min.
Total Flow	**1,735 gpm (peak)**	

R317-3-2. Sewers.

2.1. General. Construction of a new sewer system project may not begin unless the applicant has submitted an engineering report detailing the design, and construction plans to the executive secretary for review and approval evidenced by a construction permit. The executive secretary will not normally review construction plans for extensions of the existing sewer systems to new areas or replacement of sanitary sewers in the existing sewer systems unless requested or required by state or federal funding programs. Rain water from roofs, streets, and other areas, and ground water from foundation drains must not be allowed to enter the sewer system through planning, design and construction quality assurance and control measures.

2.2. Basis of Design

A. Planning Period. Sewers should be designed for the estimated ultimate tributary population or the 50-year planning period, whichever requires a larger capacity. The executive secretary may approve the design for reduced capacities provided the capacity of the system can be readily increased when required. The maximum anticipated capacity required by institutions, industrial parks, etc. must be considered in the design.

B. Sewer Capacity. The required sewer capacity shall be determined on the basis of maximum hourly domestic sewage flow; additional maximum flow from industrial plants; inflow; ground water infiltration; potential for sulfide generation; topography of area; location of sewage treatment plant; depth of excavation; and pumping requirements.

1. Per Capita Flow. New sewer systems shall be designed on the basis of an annual average daily rate of flow of 100 gallons per capita per day (0.38 cubic meters per capita per day) unless there are data to indicate otherwise. The per capita rate of flow includes an allowance for infiltration/inflow. The per capita rate of flow may be higher than 100 gallons per day (0.38 cubic meters per day) if there is a probability of large amounts of infiltration/inflow entering the system.

2. Design Flow

a. Laterals and collector sewers shall be designed for 400 gallons per capita per day (1.51 cubic meters per capita per day).

b. Interceptors and outfall sewers shall be designed for 250 gallons per capita per day (0.95 cubic meters per capita per day), or rates of flow established from an approved infiltration/inflow study.

c. The executive secretary will consider other rates of flow for the design if such basis is justified on the basis of supporting documentation.

C. Design Calculations. Detailed computations, such as the basis of design and hydraulic calculations showing depth of flow, velocity, water surface profiles, and gradients shall be submitted with plans. A calculation sheet showing each contributing area and associated pipe sizing is provided on Sheet S-3. Refer to S-4 for the location of all sewer pipes.

COLD SPRING RANCH

SEWER

FLOW CALCULATIONS

Commerical Areas

	Area (ac)	BLDG sf/ac	Building SF	Cap/SF	Capita	gal/cap/day	Peak Factor	Flow gpd	Flow gpm	Pipe Flows Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12
Commercial 1	19.85	20000	397000	0.003	1192	15	4	71532	49.7	49.7	49.7		49.7	49.7	49.7	49.7					
Commercial 2	21.74	10000	217400	0.003	653	15	4	39171	27.2	27.2							27.2	27.2	27.2	27.2	27.2
Commercial 3	7.65	10000	76500	0.003	230	15	4	13784	9.6	9.6							9.6	9.6	9.6	9.6	9.6

Residential Areas

	Area (ac)	Density Range Low	Density Range High	ERU Low	ERU High	gal/eru/day		gpd	gpm												
VHD #1	12.76	12	20	153	255	380	4	387904	269.4	269.4	269.4		269.4	269.4	269.4						
VHD #2	4.71	12	20	57	94	380	4	143184	99.4	99.4	99.4		99.4	99.4	99.4						
HD #1	12.21	7	12	85	147	380	4	222710	154.7	154.7	154.7	154.7									
HD #2	8.66	7	12	61	104	380	4	157958	109.7	109.7							109.7	109.7	109.7	109.7	
HD #3	4.64	7	12	32	56	380	4	84634	58.8	58.8							58.8	58.8	58.8	58.8	
HD #4	10.70	7	12	75	128	380	4	195168	135.5	135.5							135.5	135.5	135.5		
HD #5	9.86	7	12	69	118	380	4	179846	124.9	124.9	124.9	124.9									
MD #1	5.05	3	8	15	40	380	4	61408	42.6	42.6	42.6		42.6								
MD #2	20.43	3	8	61	163	380	4	248429	172.5	172.5							172.5	172.5			
MD #3	7.49	3	8	22	60	380	4	91078	63.2	63.2	63.2		63.2	63.2							
MD #4	16.51	3	8	50	132	380	4	200762	139.4	139.4	139.4		139.4								
MD #5	21.49	3	8	64	172	380	4	261318	181.5	181.5							181.5				
LD #1	22.85	2	4	46	91	380	4	138928	96.5	96.5	96.5										

PIPE SIZING CALCULATIONS

Pipe Sizing Calculation (Project Flows)

	Pipe Flows Pipe 1	Pipe 2	Pipe 3	Pipe 4	Pipe 5	Pipe 6	Pipe 7	Pipe 8	Pipe 9	Pipe 10	Pipe 11	Pipe 12
Flow (gpm):	1735	1040	280	664	482	418	50	695	513	341	205	37
Proposed Pipe Diameter (in):	15	10	8	10	8	8	8	10	8	8	8	8
Minimum Pipe Slope (%):	0.36%	1.12%	0.33%	0.46%	0.79%	0.60%	0.33%	0.50%	0.90%	0.40%	0.33%	0.33%
Pipe Capacity (gpm):	1744.3	1043.5	314.3	668.8	483.4	421.3	314.3	697.2	515.9	343.9	314.3	314.3
Pipe Velocity (ft/s):	3.17	4.26	2.01	2.73	3.09	2.69	2.01	2.85	3.29	2.20	2.01	2.01
Sizing Check:	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Notes:

1 - Sizing check says "OK" if velocity if greater than 2 ft/s and if pipe capacity is greater than the flow.

2 - GPD calculations are based on the high end of the density range to be conservative.

NOTES:

1. SEWER WILL BE REQUIRED TO CROSS THE JORDAN RIVER TO CONNECT TO THE CITY'S SEWER SYSTEM. DESIGN WILL BE COMPLETED WITH FINAL DESIGN OF FIRST PHASE.
2. CONSTRUCTION OF RIVER CROSSING WILL NEED TO BE COMPLETED BEFORE ANY BUILDING PERMITS WILL BE ISSUED.

LEGEND

- (#) PIPE #
- MASTER PLAN LINE
- PROJECT LINE

NORTH

SCALE: 1" = 250'

250 125 0 250

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NOT FOR CONSTRUCTION

SR 68

(REDWOOD ROAD)

3600 WEST

COMMERCIAL 1

COMMERCIAL 2

COMMERCIAL 3

VHD #1

VHD #2

HD #1

HD #2

HD #3

HD #4

HD #5

MD #1

MD #2

MD #3

MD #4

MD #5

LD #1

STUB 15" SEWER FOR FUTURE DEVELOPMENT

STUB 10" SEWER FOR FUTURE DEVELOPMENT

#3 8" @ 0.33% (PROJECT) 18" (MASTER PLAN)

#2 10" @ 1.12% (PROJECT) 18" (MASTER PLAN)

#4 10" @ 0.46% (MIN.)

#5 8" @ 0.79% (MIN.)

#6 8" @ 0.6% (MIN.)

#7 8" @ 0.33% (MIN.)

#2 12" @ 0.43% (PROJECT) 24" (MASTER PLAN)

#1 15" @ 0.36% (PROJECT) 24" (MASTER PLAN)

#8 10" @ 0.50% (MIN.)

#9 8" @ 0.90% (MIN.)

#10 8" @ 0.40% (MIN.)

#11 8" @ 0.33% (MIN.)

#12 8" @ 0.33% (MIN.)

RIVER CROSSING REQUIRED (SEE NOTES)

EXISTING 24" SEWER STUB

EXISTING SEWER

FLOOD ZONE AE/X

JORDAN RIVER

COLD SPRING RANCH

LEHI, UTAH

SEWER MASTER PLAN

REVISIONS	
1	-
2	-
3	-
4	-
5	-

LEI PROJECT #:	2015-0125
DRAWN BY:	BAP
CHECKED BY:	BTG
SCALE:	1" = 250'
DATE:	1/11/2018

SHEET

S-4