HOLBROOK FARMS AREA PLAN
PRESSURE IRRIGATION

Introduction

Lehi City conducted a water model analysis of the region which included the Holbrook Farms properties. This document represents a water system analysis specific to the Holbrook Farms Area plan. For this analysis the following assumptions have been made:

1. Water source from connection to existing Lehi City pressure irrigation system on east side of the Jordan River
2. Future water source from Utah Lake Distributing Canal with associated facilities to lift to reservoirs
3. Lower reservoir elevation of 4767 (4760 HW ELEV) operation 4752
4. Upper reservoir elevation of 5110

Design Criteria

Minimum Pipe Size	8"
Pipe Roughness Coefficient	130
Average Flow	3.5 gallons per minute per acre
Peak Hourly Flow	7.0 gallons per minute per acre (Peaking Factor = 2)
Storage	5,040 gallons per acre
Source	3.5 gallons per minute per acre
Fire Flow	1,500 gallons per minute (2 hour fire) - Big Box Commercial
Minimum Pressure	50 psi at peak flow 20 psi at peak flow with fire flow

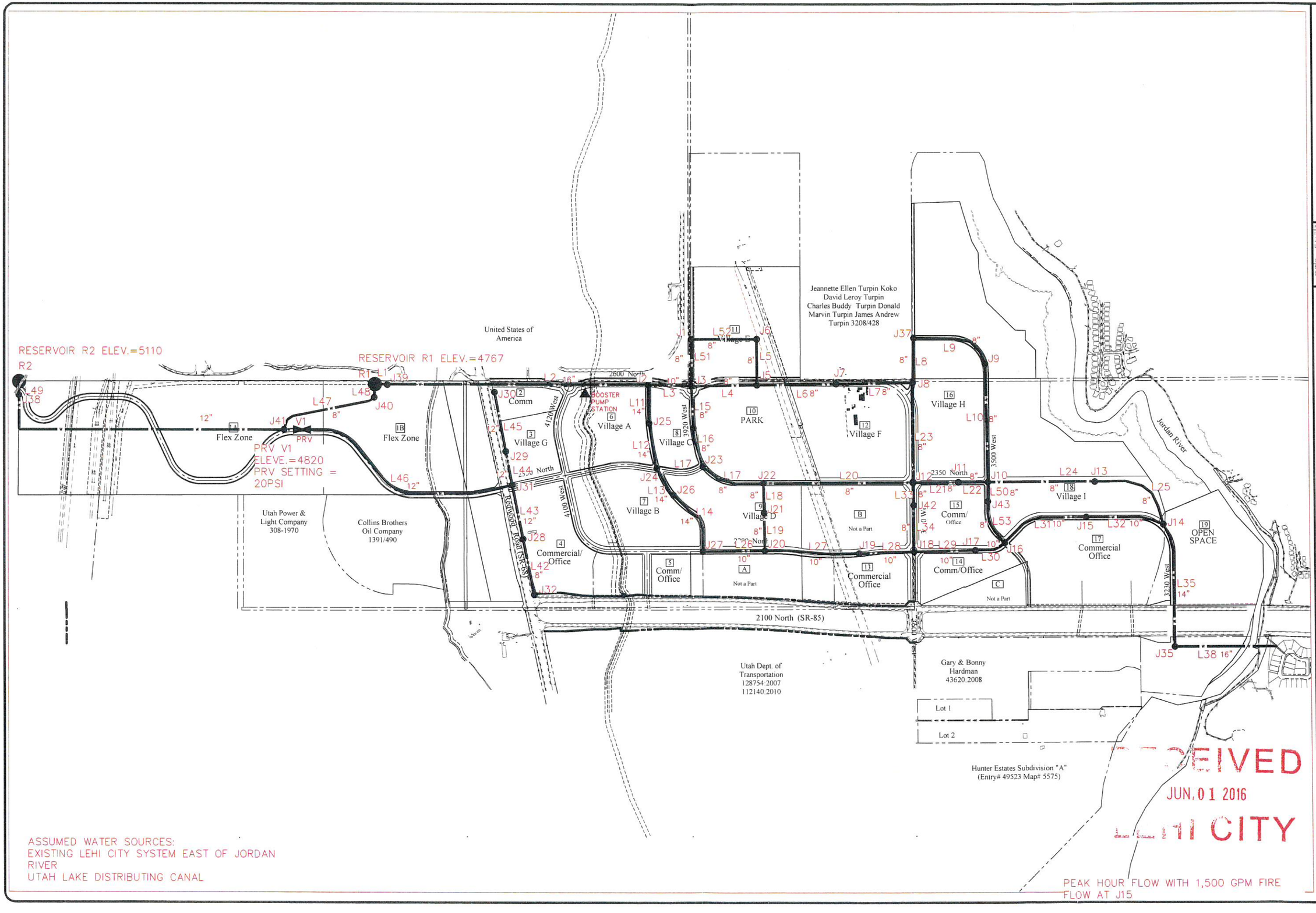
Summary of Results

Peak Hourly Flow	2,141.70 gallons per minute
Source Required	1,070.90 gallons per minute
Storage Required	
Upper Reservoir	419,983 gallons + 180,000 gallons fire storage = 599,983 gallons (1.84 ac-ft)
Lower Reservoir	1,122,055 gallons + 180,000 gallons fire storage = 1,302,055 gallons (4.00 ac-ft)
Case 1: Peak Hourly	
Minimum Pressure	75.32 psi @ J25
Case 2: Peak Hourly + Fire	
Minimum Pressure	71.23 psi @J26 (1,500 GPM @ J15)

HOLBROOK FARMS AREA PLAN
PRESSURE IRRIGATION

		Approx	Irr. Area	Average Flow (3.50 gpm/acre)	Peak Hourly Flow (Peak Factor 2.0)	Storage Required (5,040 gal/acre)	Storage Required
Area	Land Use	Acres	Acres	gpm	gpm	gallons	ac-ft
1A	Flex Zone*	55.00	27.50	96.25	192.5	138,600	0.43
1B	Flex Zone	82.18	41.09	143.82	287.6	207,094	0.64
2	Commercial/Office	7.18	1.80	6.28	12.6	9,047	0.03
3	Residential Area	11.48	5.74	20.09	40.2	28,930	0.09
4	Commercial/Office	28.82	7.21	25.22	50.4	36,313	0.11
5	Commercial/Office	6.19	1.55	5.42	10.8	7,799	0.02
6	Residential Area	24.33	12.17	42.58	85.2	61,312	0.19
7	Residential Area	29.37	14.69	51.40	102.8	74,012	0.23
8	Residential Area	11.98	5.99	20.97	41.9	30,190	0.09
9	Residential Area	30.04	15.02	52.57	105.1	75,701	0.23
10	Park #1 (100% Irrigated)	40.92	40.92	143.22	286.4	206,237	0.63
11	Residential Area	34.49	17.25	60.36	120.7	86,915	0.27
12	Residential Area	34.00	17.00	59.50	119.0	85,680	0.26
13	Commercial/Office	17.97	4.49	15.72	31.4	22,642	0.07
14	Commercial/Office	11.86	2.97	10.38	20.8	14,944	0.05
15	Commercial/Office	16.82	4.21	14.72	29.4	21,193	0.07
16a	Residential Area	33.88	16.94	59.29	118.6	85,378	0.26
16b	Residential Area	65.68	32.84	114.94	229.9	165,514	0.51
17	Commercial/Office	41.16	10.29	36.02	72.0	51,862	0.16
18	Residential Area	24.46	12.23	42.81	85.6	61,639	0.19
19	Park #2 (50% Irrigated)	28.19	14.10	49.33	98.7	71,039	0.22
	Totals	636.00	305.96	1,070.9	2,141.7	1,542,038	4.73
	Total Approved ERU's	2,823.00			Upper Reservoir	419,983	1.29
					Lower Reservoir	1,122,055	3.44

* Flex Zone 1A excludes Mountain View Corridor and Power Corridor



JACKSON ENGINEERING
3376 STONEHILL LANE
COTTONWOOD HEIGHTS, UTAH 84121
PHONE (801) 558-5293

FOR
IVORY DEVELOPMENT
3340 NORTH CENTER STREET
LEHI, UTAH 84043

CONTACT
BRAD MACKAY
(801) 331-6740

HOLBROOK FARMS AREA PLAN
WATER SYSTEM ANALYSIS
PRESSURE IRRIGATION WATER SYSTEM
IVORY DEVELOPMENT

NO.	DATE	REVISION	BY
1	9/2	CITY COMMENT	SLJ
2	11/24	CHNG IRR DMD	SLJ
3	3/24	CITY COMMENT	SLJ

PROJECT NO.	DATE
15.023.102	3/24/2015
DRAWN BY	CHECKED BY
SLJ	SLJ
PROJECT MANAGER	
PROJECT MANAGER	

EXHIBIT
PI03

HOLBROOK FARMS AREA PLAN
PRESSURE IRRIGATION WATER MODEL
PEAK HOUR WITH 1,500 GPM FIRE FLOW @ J9

Node Report

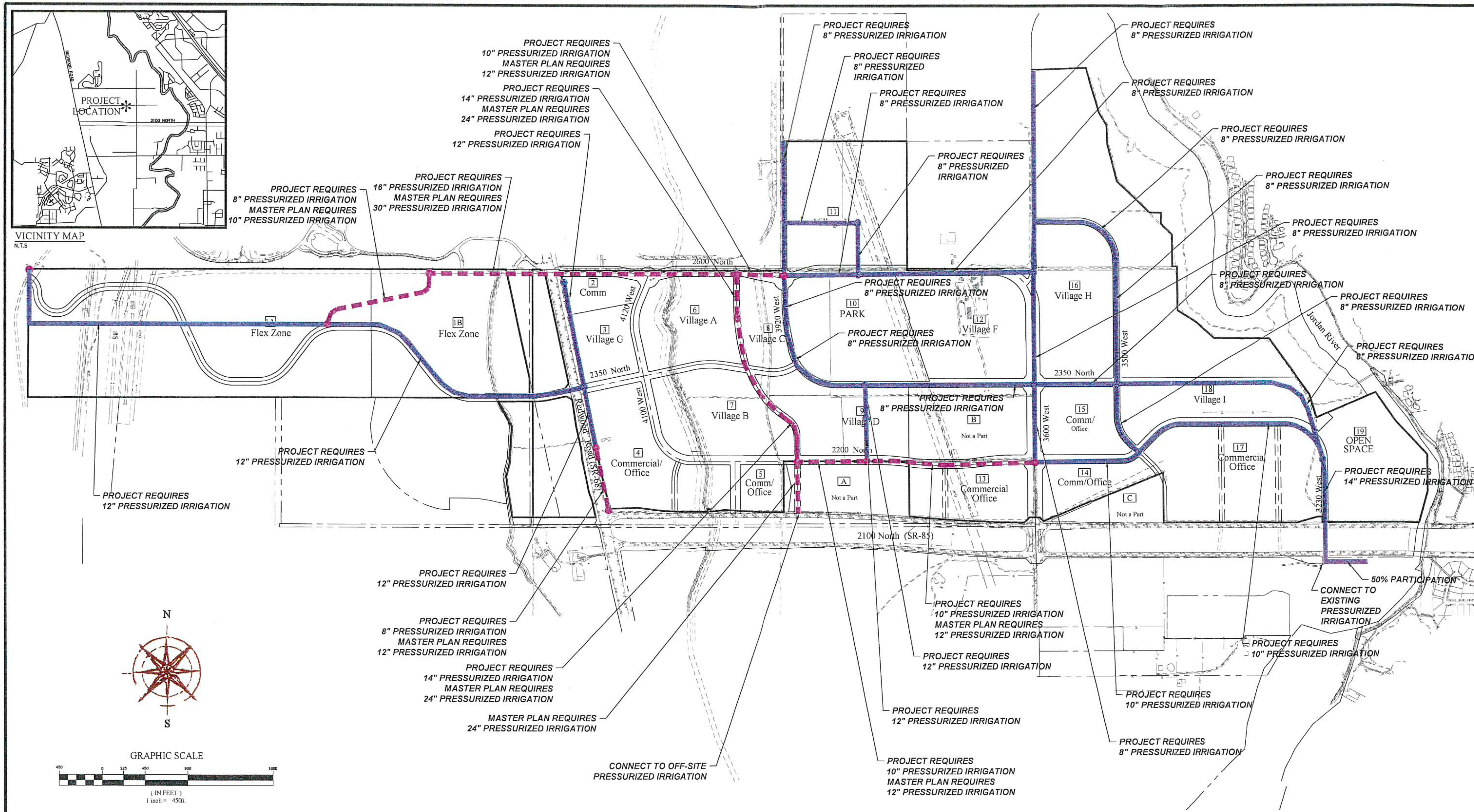
Node ID	Elevation ft	Demand GPM	Head ft	Pressure psi	Area	Land Use	
J2	4586	0.00	4747.96	71.34			
J3	4574	0.00	4746.10	74.37			
J4	4574	41.90	4745.78	74.19	8	Residential	
J5	4566	286.40	4743.08	75.46	10	Park #1	
J6	4566	120.70	0077.51	75.77	11	Residential	
J7	4560	119.00	4736.41	75.23	12	Residential	
J8	4546	118.60	4732.18	78.40	16a	Residential	
J9	4535	229.90	4721.58	80.46	16b	Residential	1,500 gpm Fire Flow
J10	4529	0.00	4731.09	82.49			
J11	4545	0.00	4732.83	77.20			
J12	4542	0.00	4733.41	80.14			
J13	4527	0.00	4731.12	84.89			
J14	4522	98.70	4731.33	82.04	19	Park #2	
J15	4525	1,572.00	4731.60	80.43	17	Commercial/Office	
J16	4528	0.00	4731.75	82.58			
J17	4532	20.80	4733.31	82.63	14	Commercial/Office	
J18	4540	0.00	4733.88	81.01			
J19	4546	31.40	4738.29	80.70	13	Commercial/Office	
J20	4554	0.00	4740.14	80.26			
J21	4556	105.10	4740.14	79.35	9	Residential	
J22	4558	0.00	4740.14	78.49			
J23	4572	0.00	4743.78	74.93			
J24	4584	0.00	4746.46	70.69			
J25	4588	85.20	4747.52	69.70	6	Residential	
J26	4582	102.80	4745.64	71.23	7	Residential	
J27	4573	10.80	4744.20	74.60	5	Commercial/Office	
J28	4670	50.40	4865.89	83.78	4	Commercial/Office	
J29	4670	40.20	4865.89	83.78	3	Residential	
J30	4675	12.60	4865.89	81.61	2	Commercial/Office	
J31	4675	480.10	4865.89	81.61	1	Flex Zone	
J32	4665	0.00	4865.89	85.95			
J37	4545	0.00	4728.80	77.97			
J38	5100	0.00	5110.00	4.33			
J39	4762	0.00	4766.97	2.16			
J40	4762	0.00	4767.00	2.17			
J41	4820	0.00	4866.16	20.00			
J1	4570	0.00	4745.58	75.54			
J42	4544	29.40	4733.50	79.28	15	Residential	
J43	4531	85.60	4731.21	81.57	18	Residential	
Reservoir 1	4752	-3,069.50	4767.00	6.50			
Reservoir 2	5095	-583.30	5110.00	6.50			

HOLBROOK FARMS AREA PLAN
PRESSURE IRRIGATION WATER MODEL
PEAK HOUR WITH 1,500 GPM FIRE FLOW @ J15

Pipe Report

Link ID	Diameter in	Flow GPM	Velocity fps	Length ft	Roughness	Status
L1	16	3,058.30	4.88	5	130	Open
L2	16	3,058.30	4.88	3300	130	Open
L3	10	1,248.57	5.10	540	130	Open
L4	8	589.28	3.76	800	130	Open
L5	8	338.34	2.16	300	130	Open
L6	8	641.22	4.09	1100	130	Open
L7	8	522.22	3.33	800	130	Open
L8	8	432.25	2.76	515	130	Open
L9	8	432.25	2.76	1100	130	Open
L10	8	202.35	1.29	1380	130	Open
L11	14	1,809.73	3.77	500	130	Open
L12	14	1,724.53	3.59	520	130	Open
L13	14	1,283.45	2.67	400	130	Open
L14	14	1,180.65	2.46	750	130	Open
L15	8	200.25	1028.00	450	130	Open
L16	8	158.35	1.01	450	130	Open
L17	8	599.43	3.83	820	130	Open
L18	8	5.67	0.04	400	130	Open
L19	8	99.43	0.63	400	130	Open
L20	8	593.75	3.79	1750	130	Open
L21	8	539.71	3.44	650	130	Open
L22	8	539.71	3.44	650	130	Open
L23	8	28.63	0.18	1200	130	Open
L24	8	435.99	2.78	650	130	Open
L25	8	435.99	2.78	1400	130	Open
L26	10	1,169.85	4.78	720	130	Open
L27	10	1,070.42	4.37	1000	130	Open
L28	10	1,039.02	4.24	800	130	Open
L29	10	1,035.04	4.23	650	130	Open
L30	10	1,014.24	4.14	650	130	Open
L31	10	1,234.71	5.04	875	130	Open
L32	10	337.29	1.38	875	130	Open
L35	14	0.00	0.00	1200	130	Closed
l38	16	0.00	0.00	1200	130	Closed
L42	8	0.00	0.00	1600	130	Open
L43	12	50.40	0.14	400	130	Open
L44	12	52.80	0.15	400	130	Open
L45	12	12.60	0.04	600	130	Open
L46	12	583.30	1.65	3000	130	Open
L47	8	0.00	0.00	1500	130	Closed
L48	8	0.00	0.00	5	13	Open
L49	12	583.30	1.65	5	130	Open
L51	8	459.04	2.93	300	130	Open
L52	8	459.04	2.93	800	130	Open
L33	8	25.41	0.16	200	130	Open
L34	8	3.99	0.03	600	130	Open
L50	8	306.07	1.25	200	130	Open
L53	8	220.47	1.41	600	130	Open
L55	8	441.08	2.82	550	130	Open
V1 PRV	12	163.40	0.46	#N/A	#N/A	Active

Setting 20 psi



NOTES:

1. ADDITIONAL MODELING MAY BE REQUIRED IF THE COMMERCIAL LAND USES CHANGE.

LEGEND

PROJECT REQUIRED PI

LEHI MASTER PLAN PI

RECEIVED
SEP 22 2016
LEHI CITY

FOCUS
ENGINEERING AND SURVEYING, LLC
32 WEST CENTER STREET
MIDVALE, UTAH 84047 PH: (801) 352-0075
www.focusutah.com

Holbrook Farms

Lehi City

Pressurized Irrigation Master Plan VS. Project Plan

Scale: 1"=450'	Drawn: TMR
Date: 09/21/16	Job #: 14-273
Sheet:	

PI 06

Z:_2014\14-273 Holbrook Area Plan\design 14-273\dwg\area plan\pressurized irrigation\Irrigation Plan.dwg