

RED BRIDGE STATION AMENDMENT # 1 TO THE ADOPTED



SOUTH MEADOWS AREA SPECIFIC PLAN

Payson City
JANUARY 2016

AMENDMENT #1 APR 2021



Prepared by blū line designs for Payson City

RED BRIDGE STATION AMENDMENT # 1

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RED BRIDGE STATION AMENDMENT # 1

NARRATIVE

AS PART OF THE APPROVAL PROCESS FOR THE RED BRIDGE STATION PROJECT, IT HAS BECOME APPARENT THAT AN UPDATE TO THE SOUTH MEADOWS AREA SPECIFIC PLAN IS NEEDED. THE MAIN AMENDMENT TO THE CURRENT SPECIFIC PLAN IS THE UPDATE OF THE LAND USE PLAN AS SHOWN IN FIGURE 4.1.

WITH THE COMMITMENT OF MTECH TO LOCATE A 13.31 ACRE CAMPUS WITHIN THE DEVELOPMENT, A PLAN UPDATE IS NEEDED AS SHOWN IN FIGURE 4.2 "RED BRIDGE STATION AMENDMENT #1 - LAND USE PLAN".

THIS AMENDMENT PROPOSES THE FOLLOWING WITHIN THE RED BRIDGE STATION DEVELOPMENT:

1. CREATE A 13.31 AC SCHOOL AREA WITHIN THE RED BRIDGE STATION DEVELOPMENT
2. ADJUST THE BOUNDARIES OF THE MIXED USE - COMMERCIAL AREA FROM 27.56 AC TO 23.86 AC
3. DEFINE THE AREAS OF MIXED USE (AC) AND COMMERCIAL AREAS (AC)
4. ADJUST THE BOUNDARIES OF THE RESIDENTIAL HIGH DENSITY 15 DU/AC FROM 40.01 AC TO 41.30 AC
5. REMOVE THE RESIDENTIAL LARGE LOT 2 DU/AC DESIGNATION

THESE PROPOSED CHANGES ADJUSTS THE TOTAL ALLOWED DENSITY BASED UPON NET AREA OF THE DEVELOPMENT WITHIN THE RED BRIDGE STATION. THIS CHANGE TO THE SPECIFIC PLAN IS DETAILED IN FIGURE 4.2.1 "AREA CALCULATIONS ".

THE REMAINDER OF THE SUPPORTING INFORMATION IS TO ACT AS AN UPDATE TO THE SOUTH MEADOWS AREA SPECIFIC PLAN AS TO THE ADDITIONAL STUDIES, PLANS AND ENGINEERING COMPLETED FOR THE RED BRIDGE STATION DEVELOPMENT.

THE ADDITIONAL SUPPORTING INFORMATION IS AS FOLLOWS:

FIGURE 4.4 & 4.4.1 TRAILS PLAN (AMENDED) AND TRAILS DETAILS (AMENDED)
THIS PLAN INCLUDES THE ADDITIONAL TRAILS AND BIKE LANES TO SUPPORT THE MTECH CAMPUS.

THE OTHER INFORMATION WITHIN THIS AMENDMENT TO THE SPECIFIC AREA PLAN DEALS WITH THE PROPOSED UTILITY IMPROVEMENTS TO THE SOUTH MEADOWS AREA THAT ARE PROPOSED AS PART OF THE RED BRIDGE STATION DEVELOPMENT.

THESE MASTER PLANNED IMPROVEMENTS ARE TO BE FUNDED BY THE NEWLY CREATED RED BRIDGE STATION PID.

FIGURE 5.1A PID WATER SYSTEM IMPROVEMENTS

THIS PLAN SHOWS THE MASTER PLANNED WATER LINES AND THE ADDITIONAL CULINARY WELL NEEDED.

FIGURE 5.2A PID PRESSURIZED IRRIGATION SYSTEM IMPROVEMENTS

THIS PLAN SHOWS THE MASTER PLANNED PI LINES.

FIGURE 5.3A-5.3B PID SEWER SYSTEM IMPROVEMENTS

THIS PLAN SHOWS THE MASTER PLANNED 21" SEWER OUTFALL LINE AND OTHER PID SEWER IMPROVEMENTS.

FIGURE 5.4A PID STORM DRAIN SYSTEM IMPROVEMENTS

THIS PLAN SHOWS THE MASTER PLANNED STORM DRAIN AND DISCHARGE TO ENHANCE THE WETLANDS.

FIGURE 5.5.3A PID ROADWAY DEDICATION PLAT

THIS PLAN SHOWS THE RECORDED STREET DEDICATION MAP.

FIGURE 5.5.4A PID ROADWAY SYSTEM IMPROVEMENTS

THIS PLAN SHOWS THE MASTER PLANNED ROADWAY LOCATIONS AND STRIPING.

FIGURE 5.5.5A PID STREET CROSS SECTIONS

THIS PLAN SHOWS THE APPROVED STREET CROSS SECTIONS WITH TRAVEL LANES, BIKE LANES, TRAILS AND SIDEWALKS

FIGURE 4.1 BASE SCENARIO LAND USE PLAN

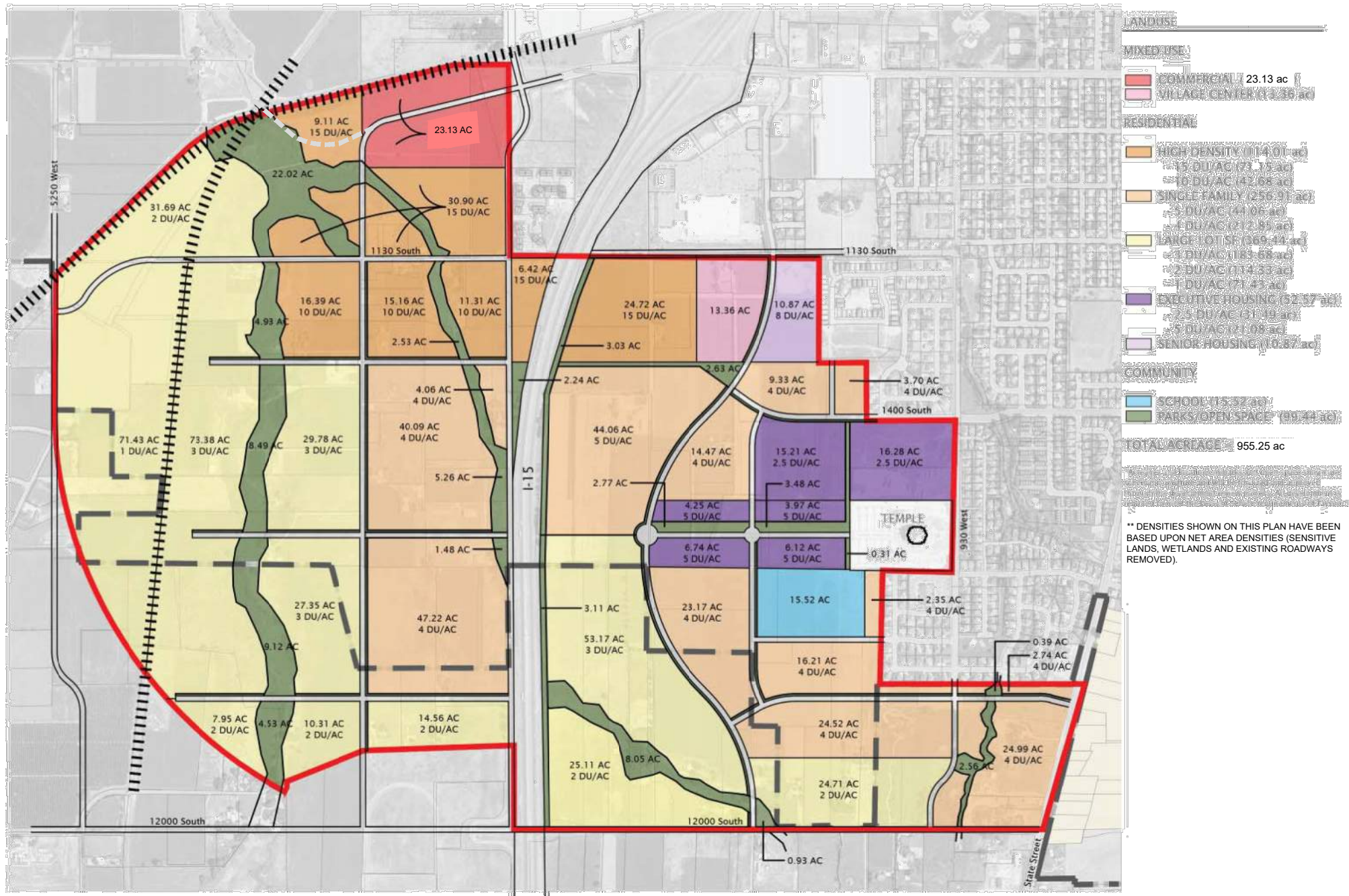
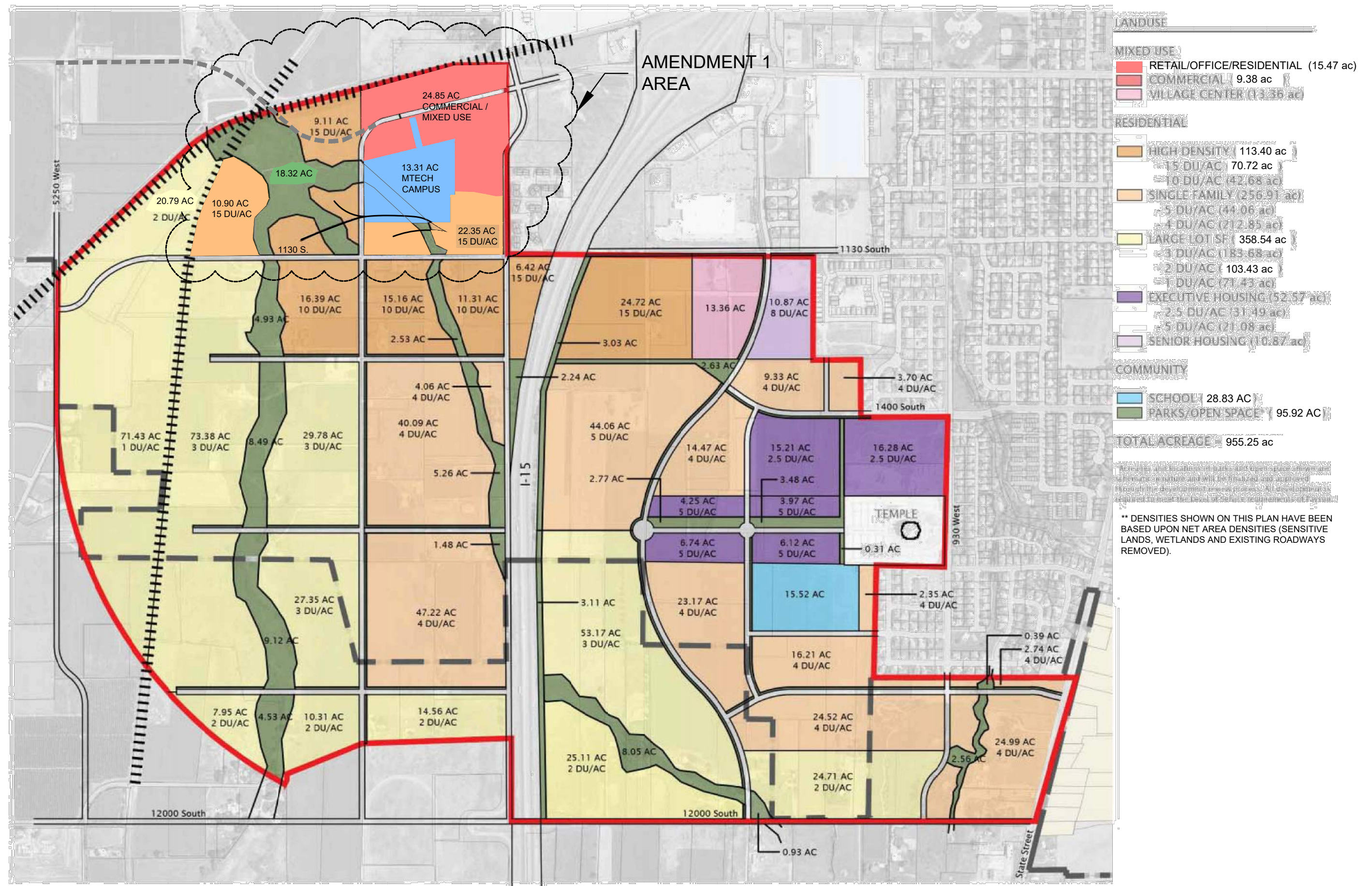


FIGURE 4.2 HIGHER EDUCATION LAND USE PLAN (AMENDED)



RED BRIDGE STATION AMENDMENT #1
BASE SCENARIO vs HIGHER EDUCATION (AMENDED)
LAND USE PLAN

LAND USE	FIGURE 4.1			FIGURE 4.2		
	BASE SCENARIO			HIGHER EDUCATION SCENARIO		
	AREA (ac)	Density DU/AC	Max Number of Dwelling Units	AREA (ac)	Density DU/AC	Max Number of Dwelling Units
MIXED USE	n/a	n/a	n/a	15.47	MU-1 Zone	490
COMMERCIAL	23.13	n/a	n/a	9.38	MU-1 Zone	n/a
RESIDENTIAL - 15 DU/AC	42.79	15	642	42.36	15	635
RESIDENTIAL - 2 DU/AC	10.9	2	22	0	2	0
SCHOOL	0	n/a	n/a	13.31	n/a	0
PARKS/OPEN SPACE	22.02	n/a	n/a	18.32	n/a	0
TOTALS	98.84	6.71	664	98.84	11.39	1125

FIGURE 4.3 - TRAILS PLAN

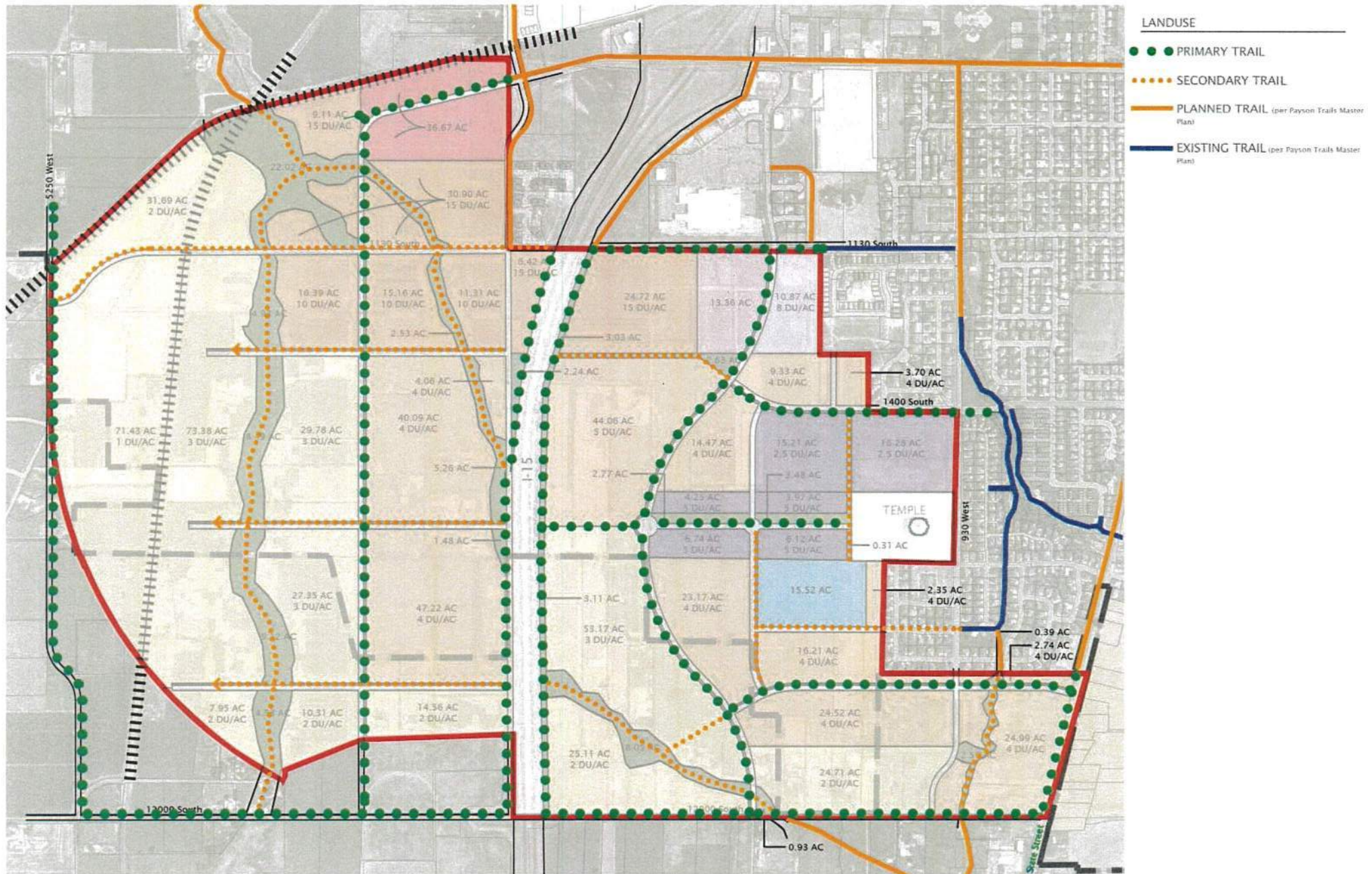


FIGURE 4.4 TRAILS PLAN (AMENDED)

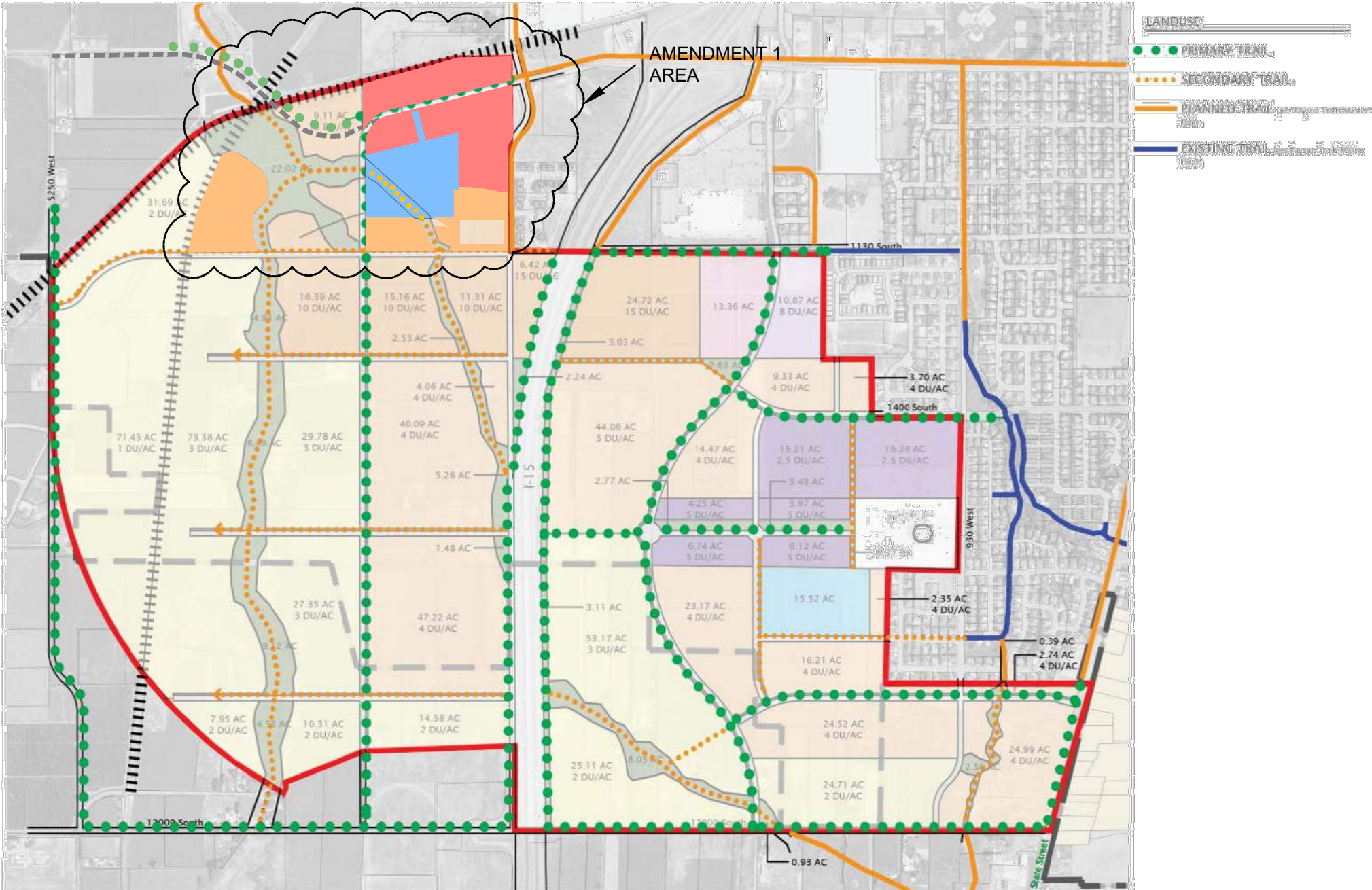


FIGURE 4.4.1 TRAILS PLAN DETAILS (AMENDED)

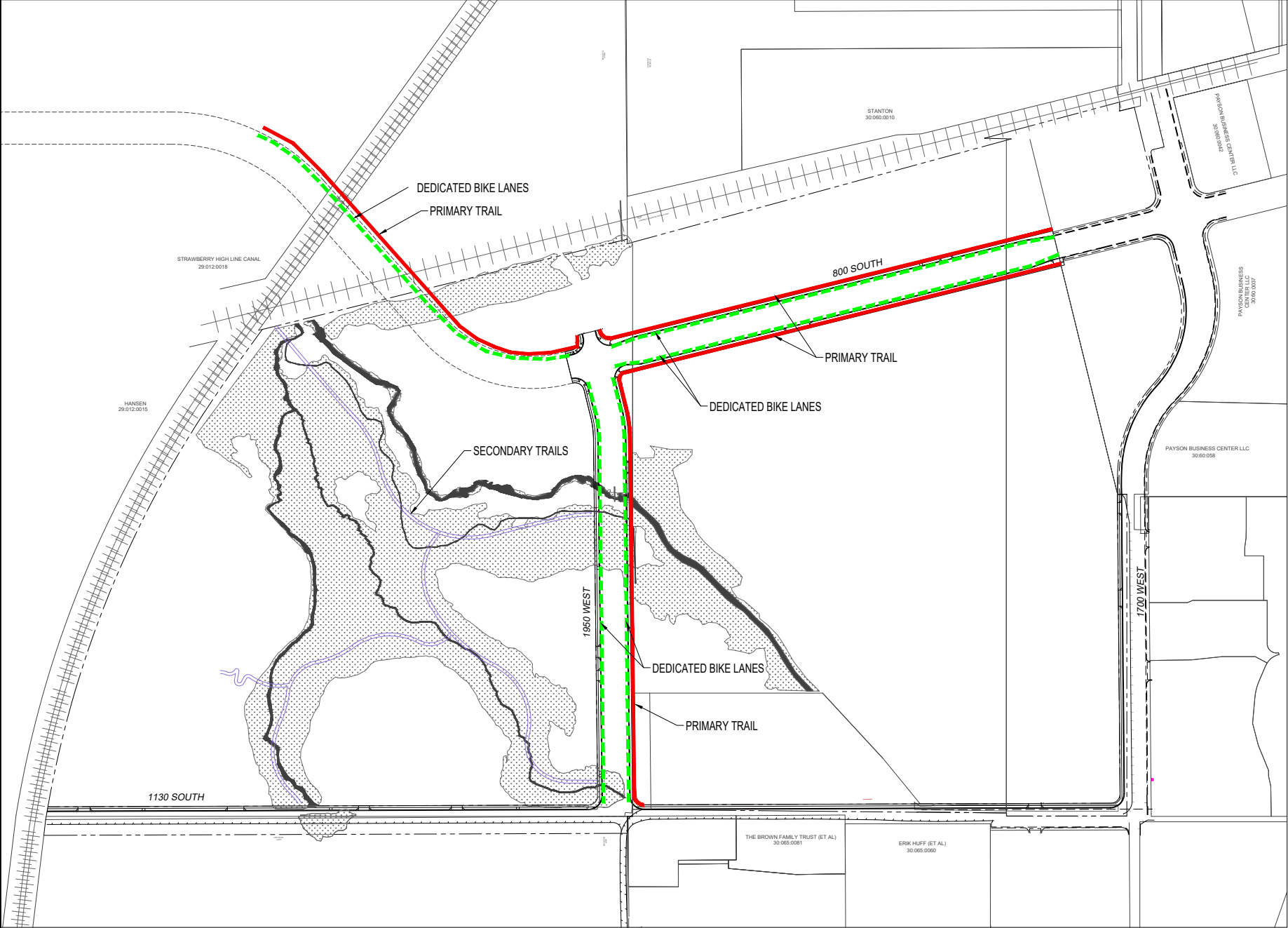


FIGURE 5.1 - CULINARY WATER

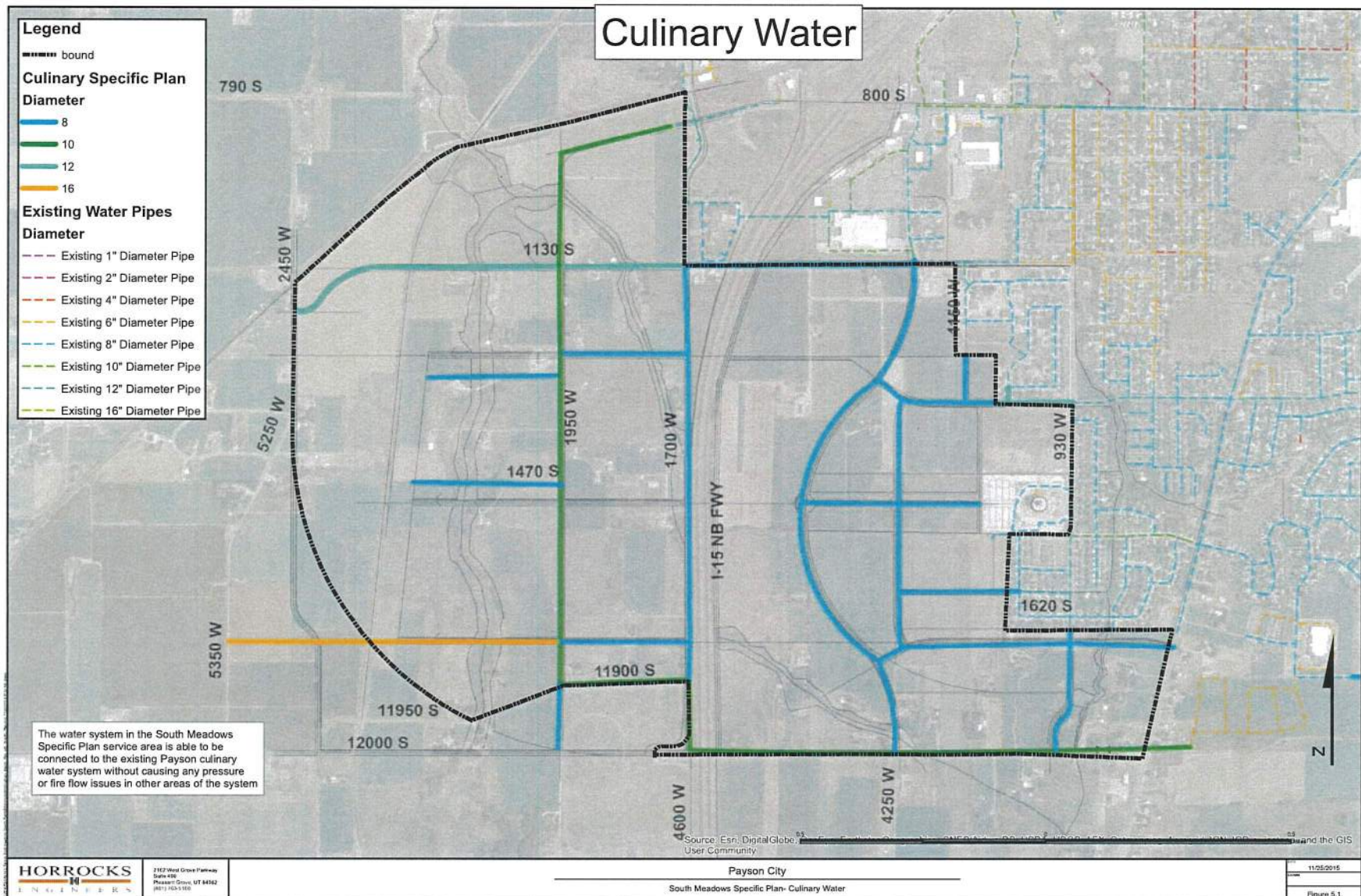


FIGURE 5.1A RED BRIDGE STATION AMENDMENT #1 PID WATER SYSTEM IMPROVEMENTS

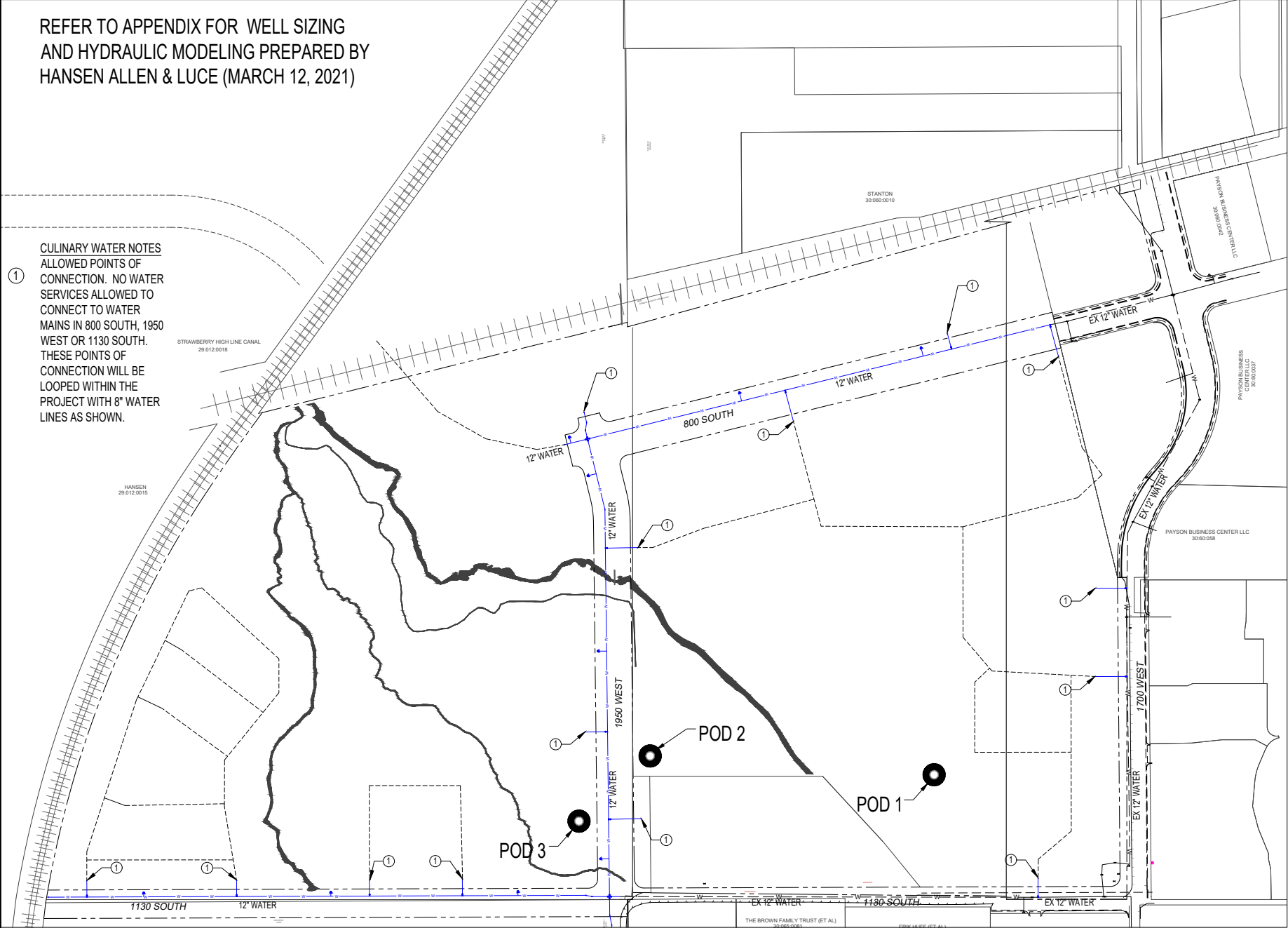


FIGURE 5.2 - PRESSURIZED IRRIGATION

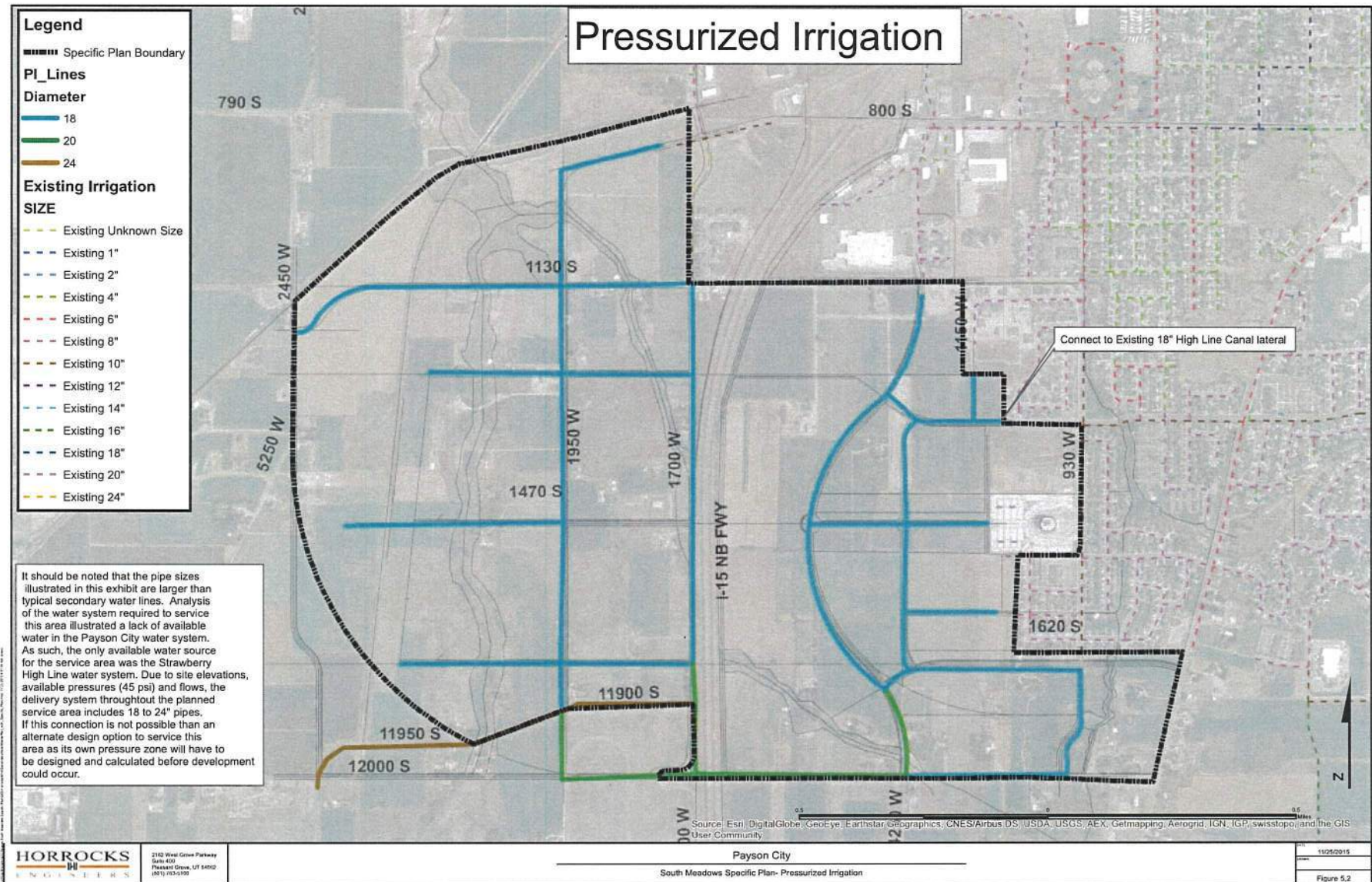
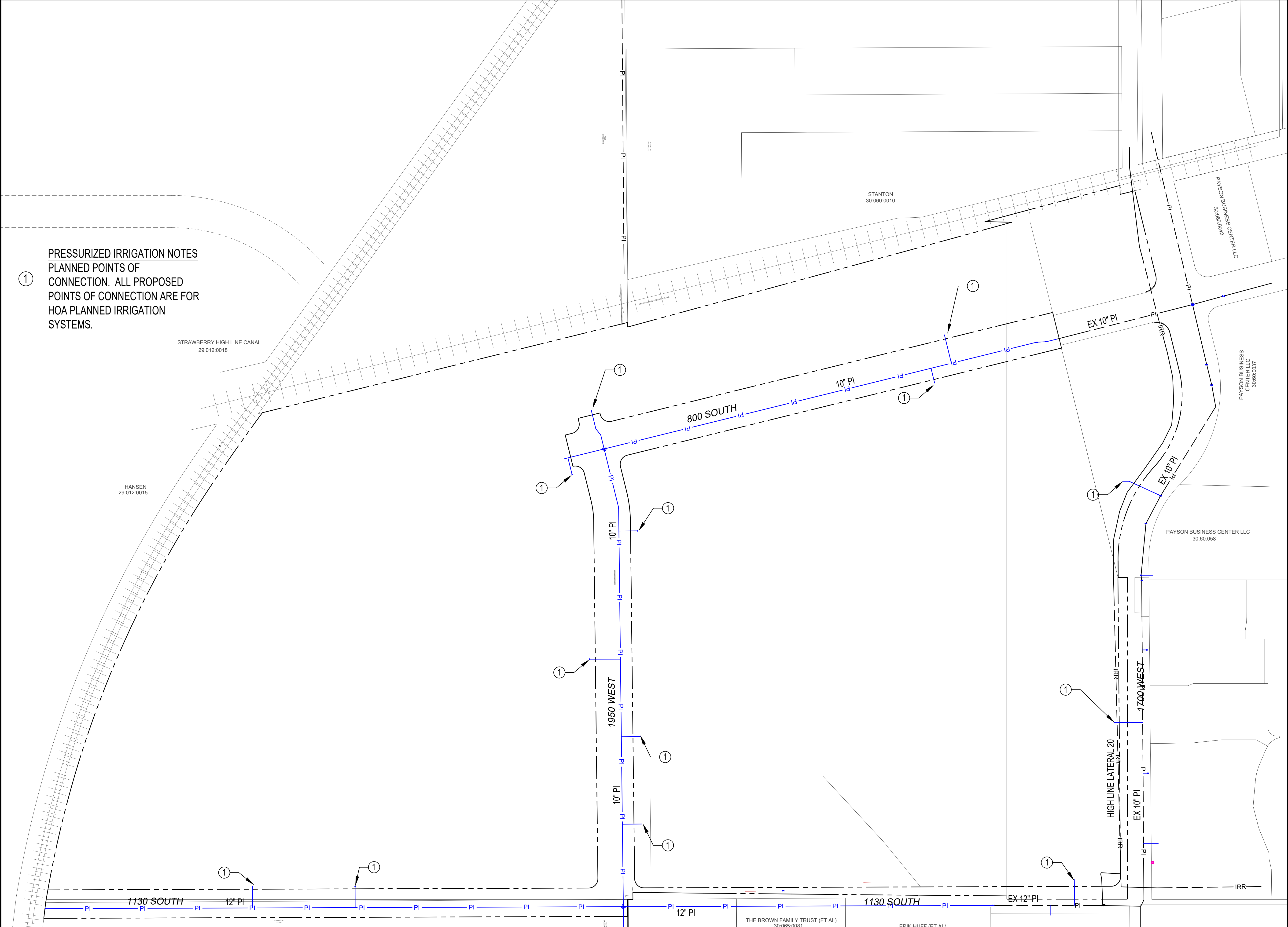


FIGURE 5.2A RED BRIDGE STATION AMENDMENT #1 - PID PRESSURIZED IRRIGATION SYSTEM IMPROVEMENTS



RED BRIDGE STATION AMENDMENT #1



FIGURE 5.3.1A RED BRIDGE STATION AMENDMENT #1 - PID SEWER SYSTEM IMPROVEMENTS



FIGURE 5.3.2A RED BRIDGE STATION AMENDMENT #1 - PID SEWER SYSTEM IMPROVEMENTS

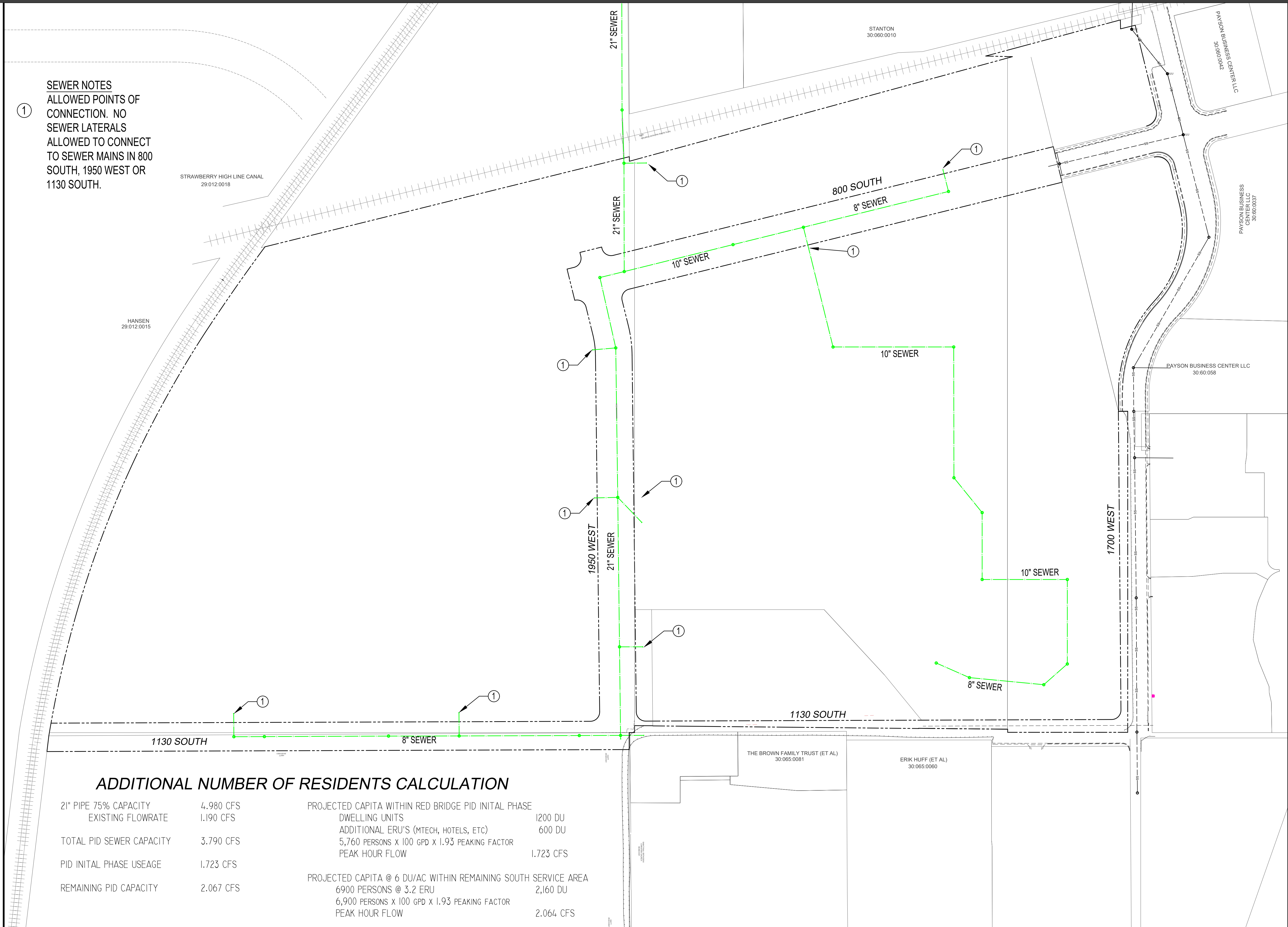


FIGURE 5.4 - STORM DRAIN

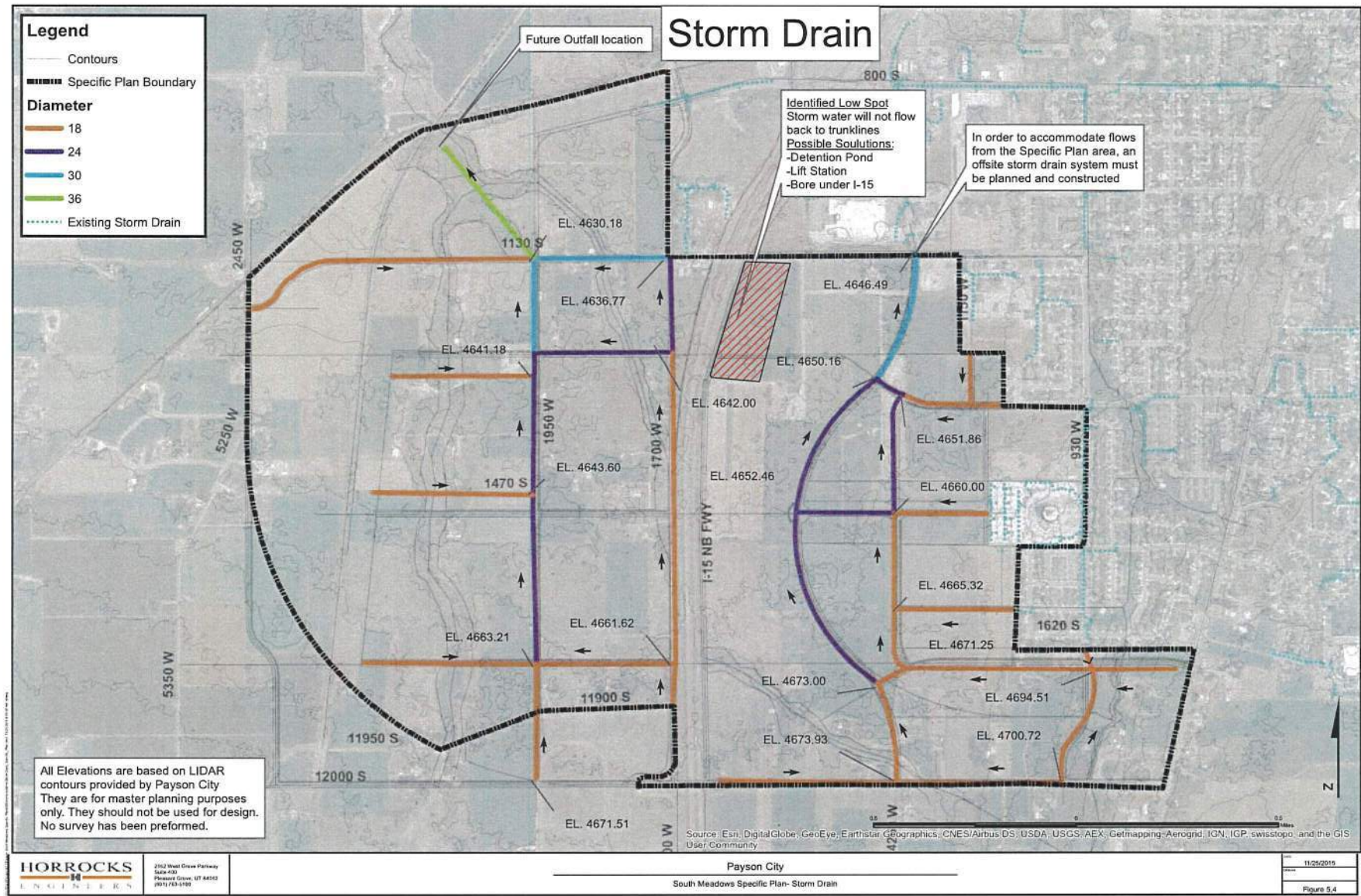
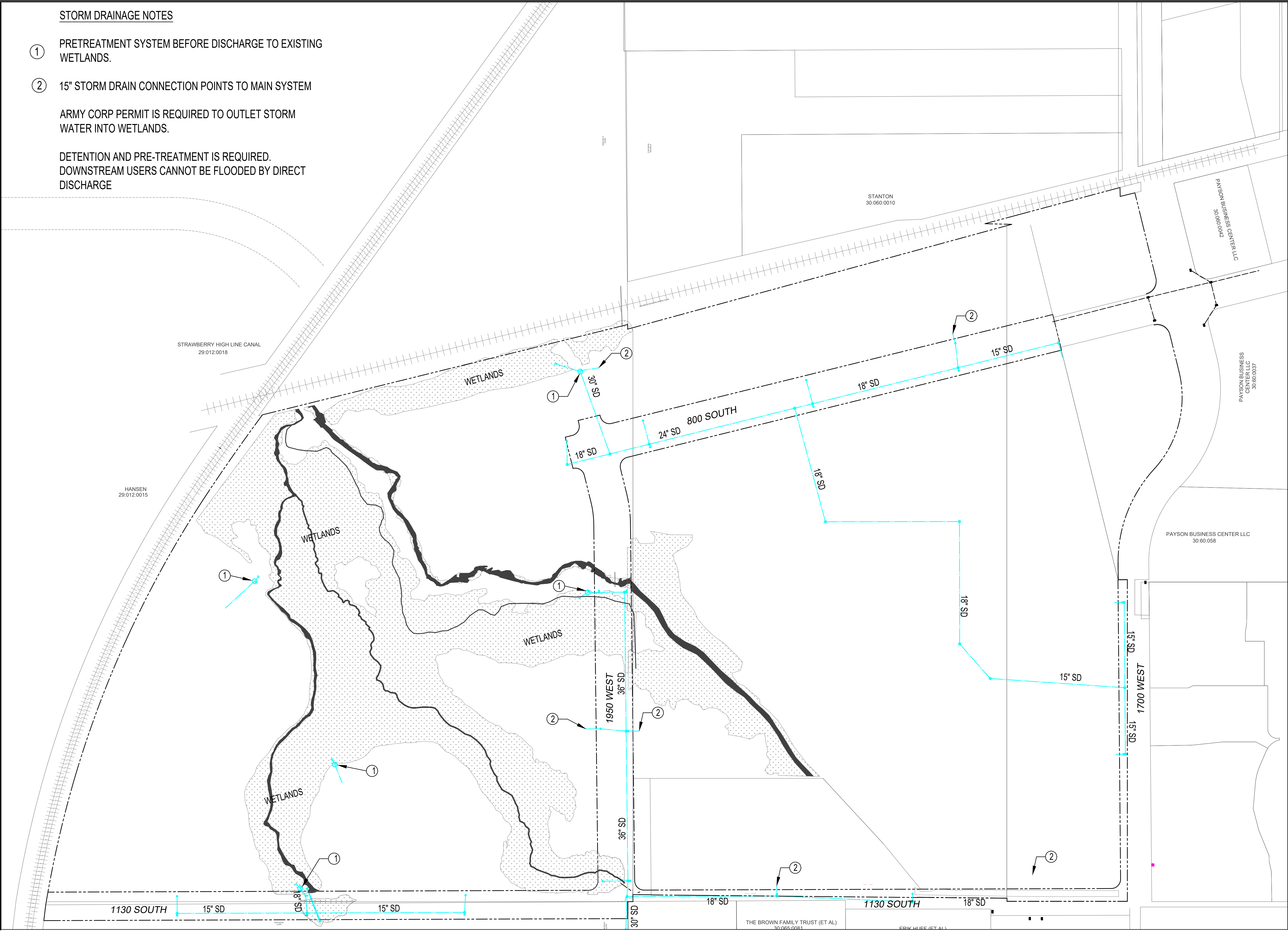


FIGURE 5.4A RED BRIDGE STATION AMENDMENT #1 - PID STORM DRAIN SYSTEM IMPROVEMENTS



RED BRIDGE STATION AMENDMENT #1

FIGURE 5.5.1 - ROADS

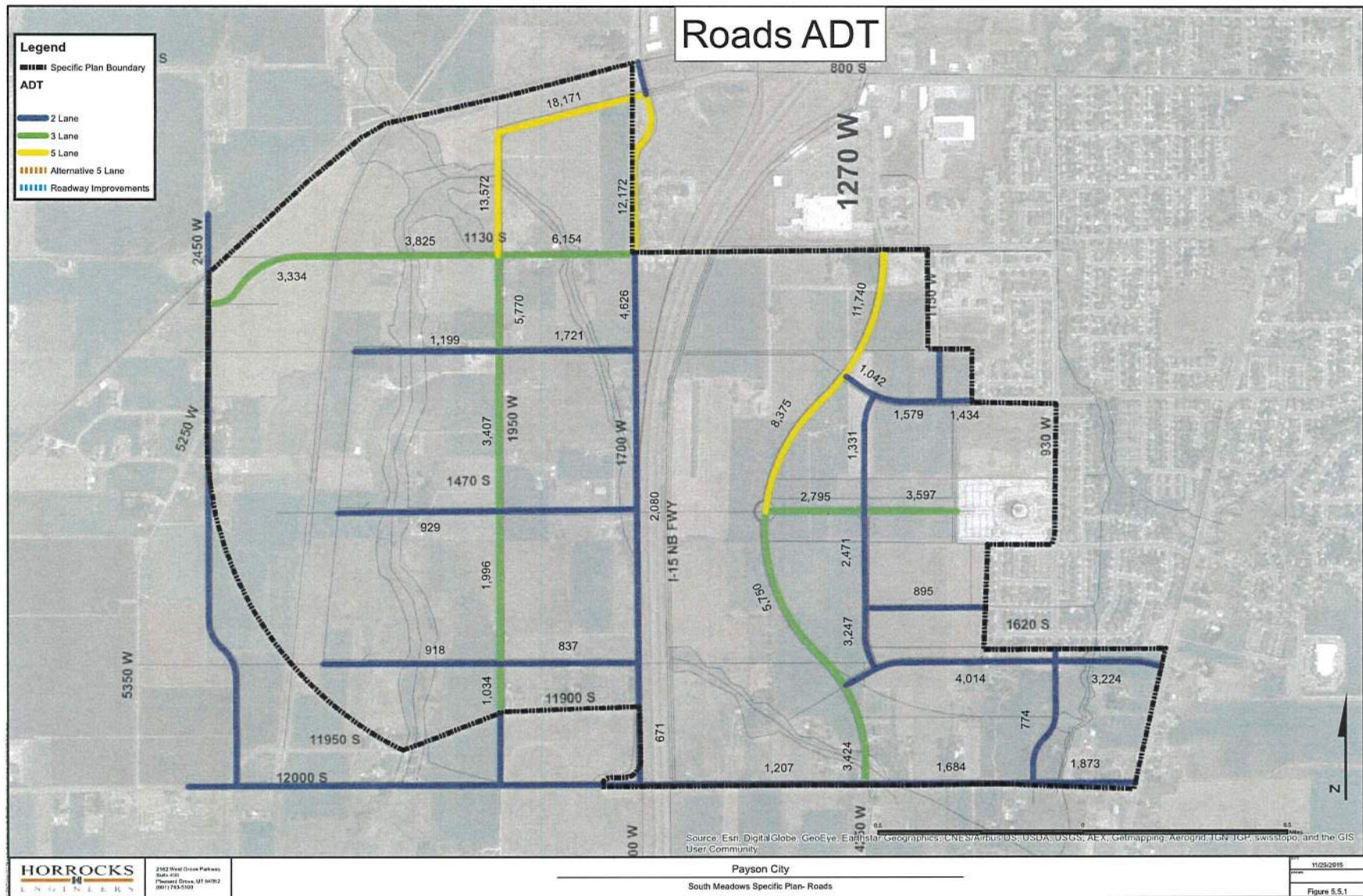
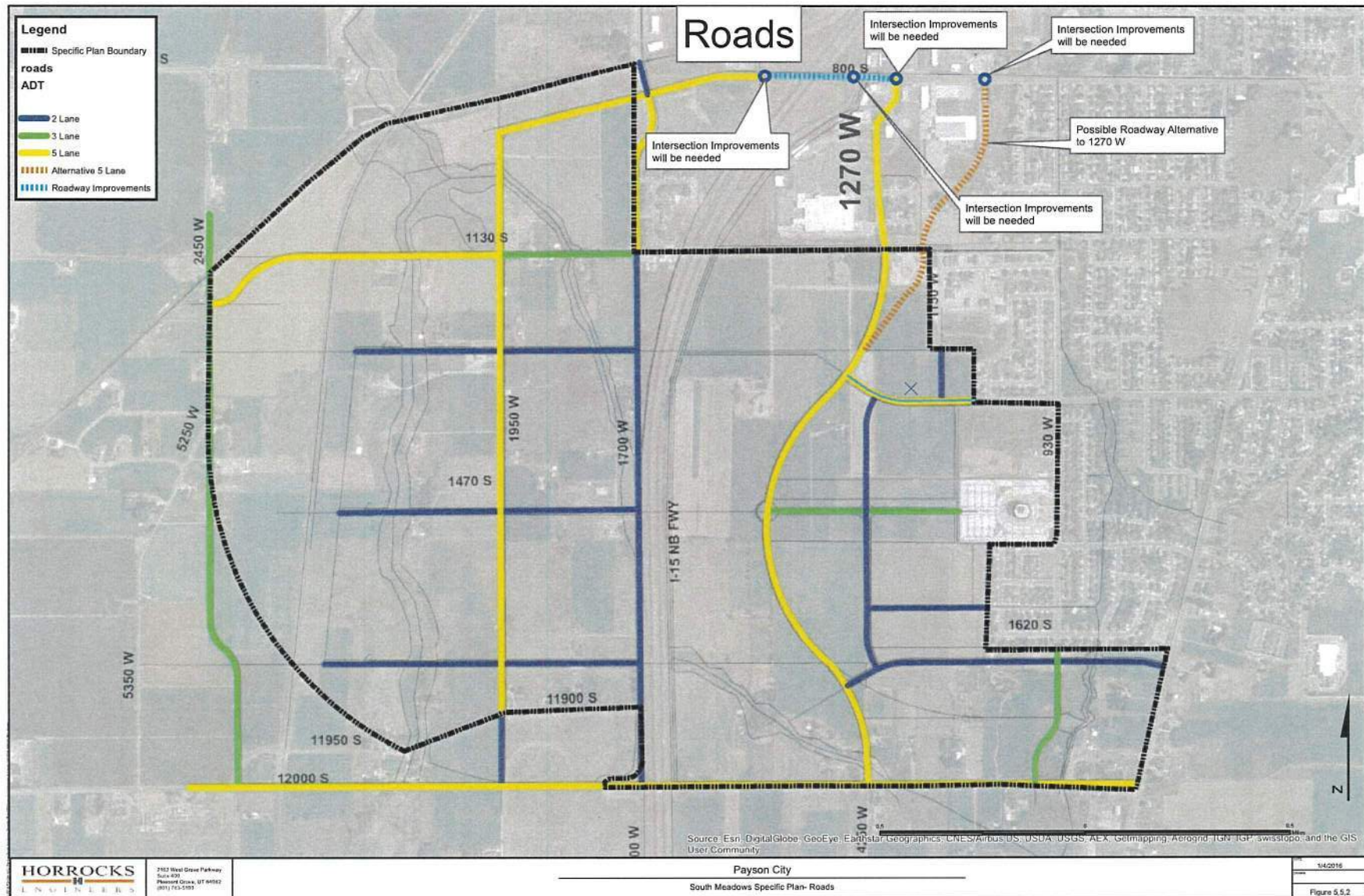


FIGURE 5.5.2 - ROADS



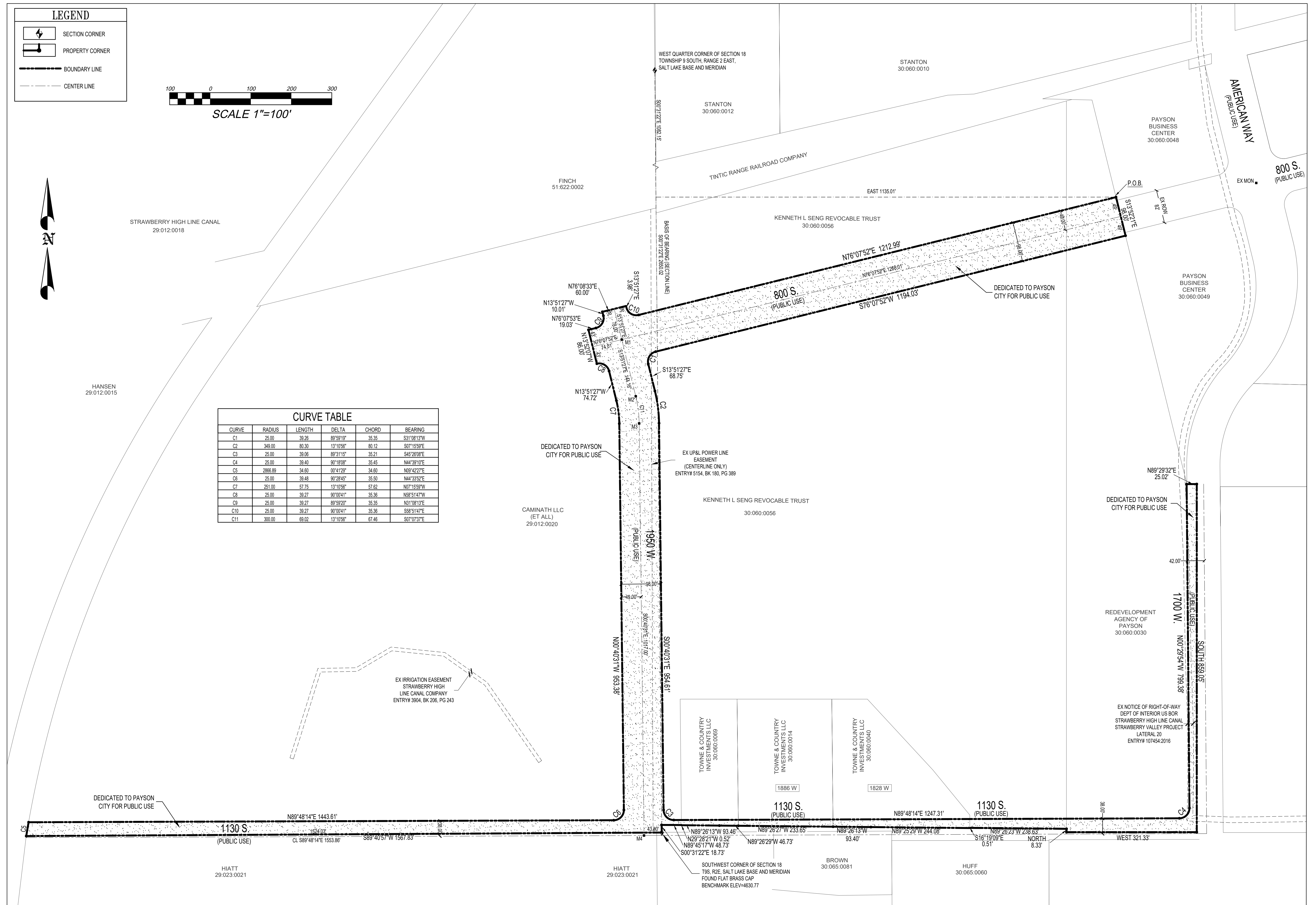


FIGURE 5.5.4A RED BRIDGE STATION AMENDMENT #1 - PID ROADWAY SYSTEM IMPROVEMENTS

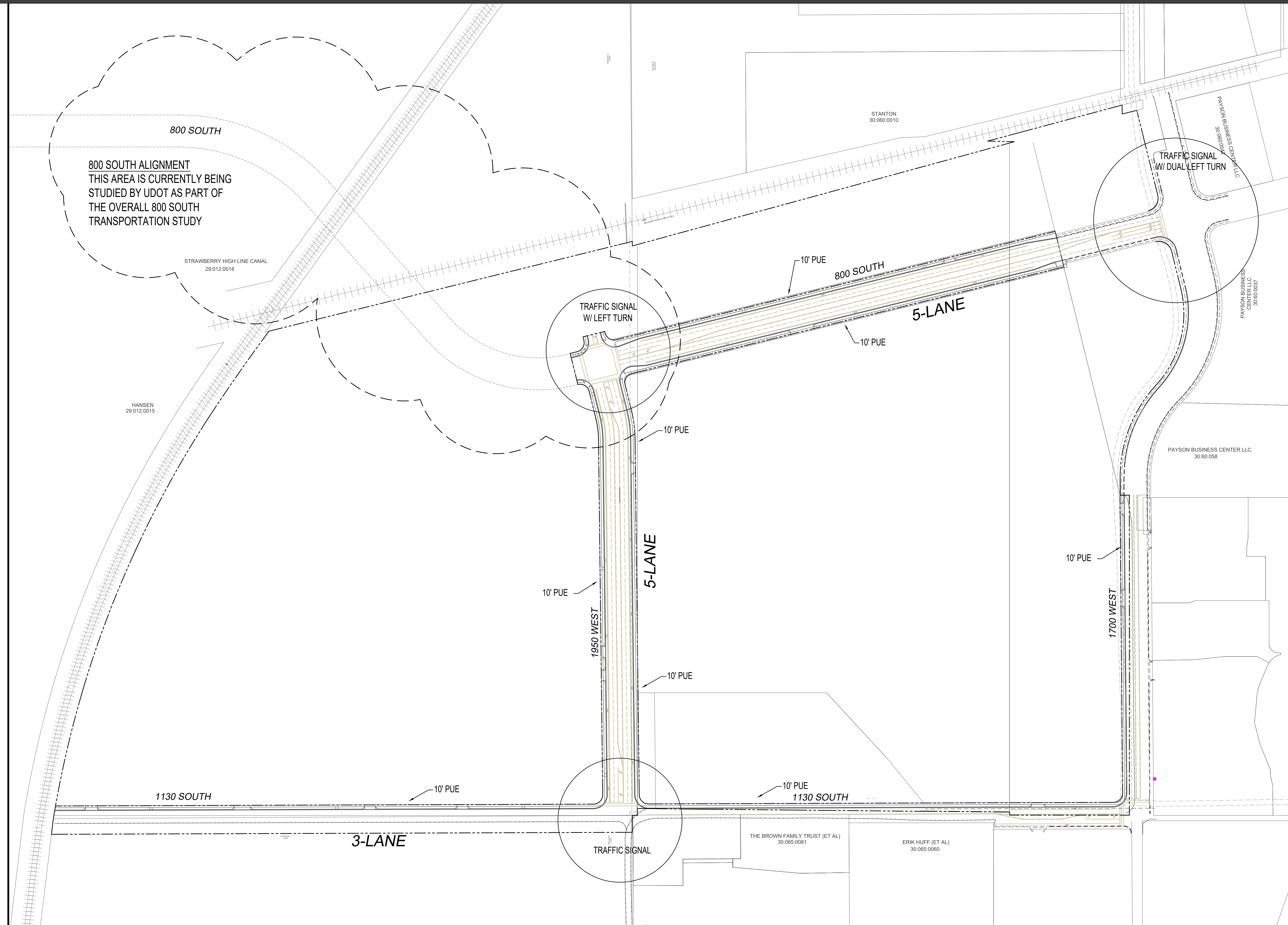
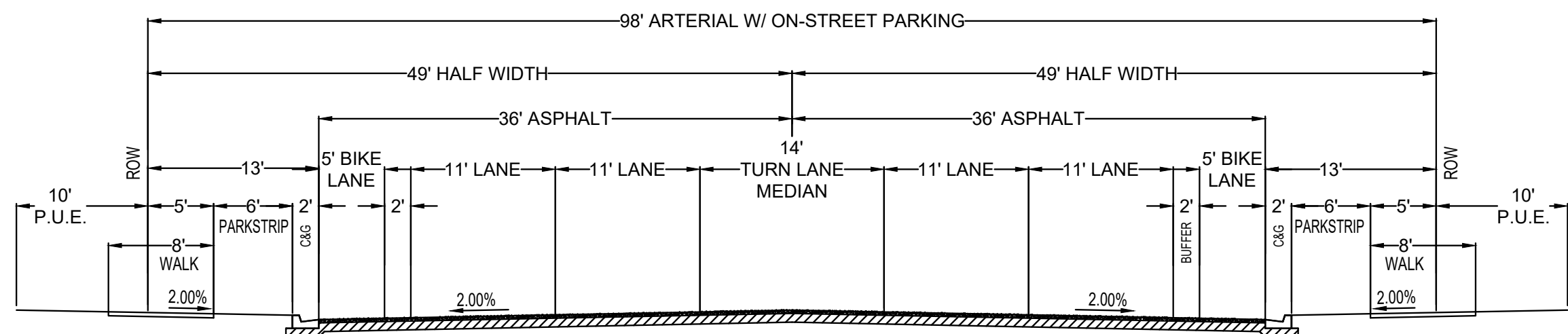


FIGURE 5.5.5A RED BRIDGE STATION AMENDMENT #1 - PID STREET CROSS SECTIONS

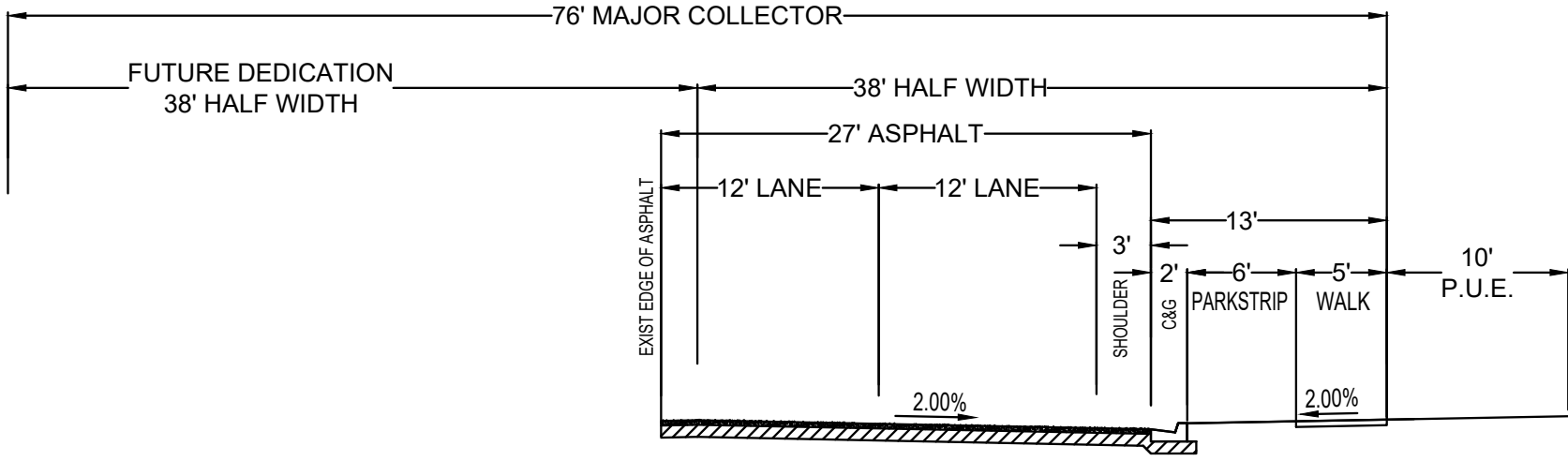
800 SOUTH

[1700 W TO 1950 W]



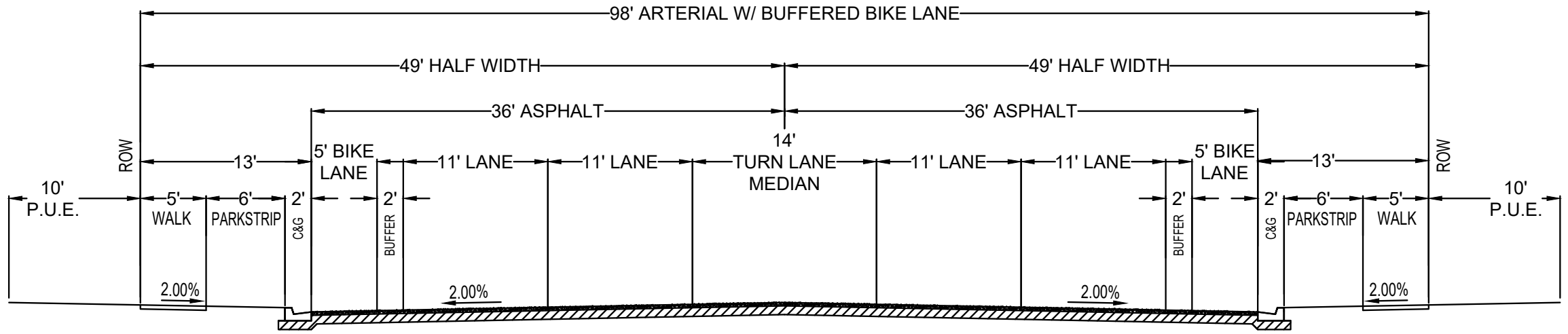
1130 SOUTH

[1700 W TO 1950 W]



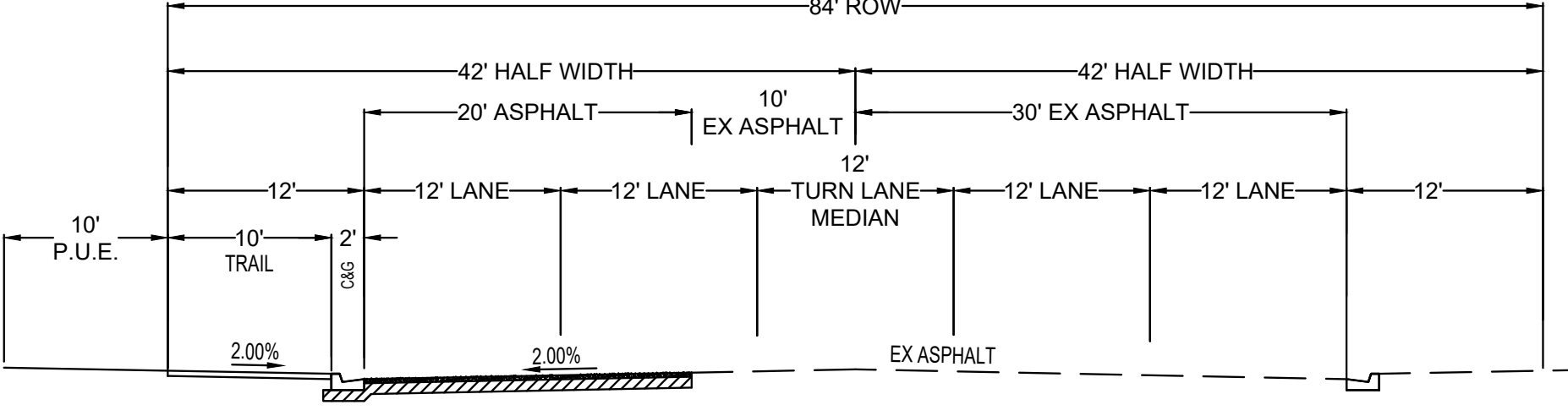
1950 WEST

[800 S TO 1130 S]

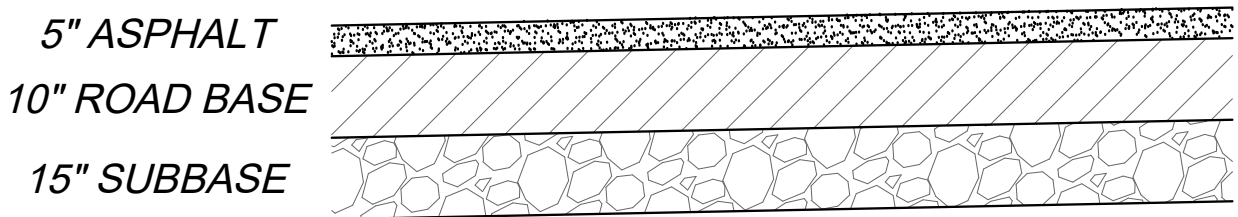


1700 WEST

[900 S TO 1130 S]



PAVEMENT SECTION



APPENDIX

MEMORANDUM

DATE: March 12, 2021
TO: City of Payson and Red Bridge PID #1

FROM: Steve Jones, P.E.
J. Lance Nielsen, P.E.
Hansen, Allen & Luce, Inc. (HAL)
859 West So. Jordan Pkwy – Suite 200
South Jordan, Utah 84095

SUBJECT: Payson City Well Siting Study
PROJECT NO.: 449.01.100



BACKGROUND

Red Bridge PID #1 (Concept Properties) retained HAL to assist Payson City with determining a site for a new well which is needed to support growth on the west side of the City. The scope for this study includes four components:

1. Modeling well locations in the drinking water hydraulic model.
2. Evaluating well locations based on the USGS groundwater model and other existing hydrogeologic information.
3. Assessing water right options of potential well locations.
4. Preparing conceptual level cost estimates for constructing a new well.

HYDRAULIC MODELING

Payson City's existing hydraulic model was used to determine locations within the system with adequate capacity to receive and distribute additional source water from the future well without causing unreasonable pressure swings due to headloss.

The Payson City drinking water system has a 12-inch diameter looped distribution main that serves the western area of the City (see Figure 1). The hydraulic model shows that source from a new well can be adequately distributed to the system if the well is connected to this 12-inch diameter loop. Optimal hydraulic performance can be achieved if this connection is made between approximately 200 S and 1000 S.

A description of the 12-inch diameter looped pipeline is included here for reference and shown in Figure 1 as the solid red line. The pipeline proceeds west under I-15 at Utah Avenue and continues until it crosses the train tracks at approximately 4400 West. From there, it proceeds southwest and parallels the train tracks until it crosses back under the tracks at 1700 West. It continues south in 1700 W until approximately 1000 S, where it crosses back under I-15.

A second area of optimal hydraulic performance is along the future 12-inch diameter looped pipeline running through the Red Bridge development area. It is demonstrated in the hydraulic model that source from a new well can be adequately distributed to the system if the well is connected to this future 12-inch diameter loop. Optimal hydraulic performance can be achieved

anywhere along this pipeline.

A description of the future 12-inch diameter looped pipeline is included here for reference and shown in Figure 1 as the yellow dashed line. The pipeline proceeds west of Utah Avenue and north of 11200 South and connects to a 12-inch pipeline in the north running along 10900 South.



Figure 1: Areas of System with Hydraulic Capacity for New Well

HYDROGEOLOGIC EVALUATION

Hydrogeologic information from USGS Technical Publication No. 111 (*Hydrology and Simulation of Groundwater Flow in Southern Utah and Goshen Valleys, Utah* by L.E. Brooks and B.J. Stolp, 1995) was used to evaluate the potential for a successful well within the study area shown in Figure 1. Well logs from existing wells located within the vicinity of the study area were also evaluated.

Well logs in the area indicate that there are high permeability sand and gravel layers at depths

ranging from 100 to 670 feet below ground surface. It is possible that there may be more potential aquifer zones below this depth, but it is largely unknown due to a lack of wells that are drilled beyond this depth. Most wells in the vicinity of the study area are small private wells that produce less than 50 gpm. There are a few larger diameter wells that produce from 1,700 gpm to 2,300 gpm.

Based on the calibrated 3-dimensional groundwater model of the Southern Utah Valley developed by Brooks and Stolp (1995), the aquifer system throughout the study area has relatively uniform properties. Hydraulic conductivity (a measure of the ability of the aquifer to transmit water) was reported in the model to be around 20 feet/day. About a mile south of the study area, the hydraulic conductivity drops to around 10 feet/day and about a mile north of the study area, it increases to about 40 feet/day.

Based on this information, it is reasonable to conclude that a well drilled anywhere within the study area is likely to be successful. It is recommended that the well be drilled at least to a depth of 700 feet. Red Bridge PID may consider drilling deeper to explore the potential for more productive aquifer zones which may increase the yield of the well.

WATER RIGHTS CONSIDERATIONS

The Utah Division of Water Rights (DWRi) GIS Data was used to determine locations within the City of Payson with approved points of diversion. An approved point of diversion is necessary before a well can be drilled.

The City of Payson has an existing point of diversion approximately 1.30 miles north of the Red Bridge PID located near the intersection of 10000 South and 4400 West. The associated water right number is 51-8552. The underground water well is located on a 4.45-acre parcel owned by Morlin and Rebecca Oldham (Serial #: 41:748:004) who also own the 21.46-acre parcel to the west. Figure 2 shows the location of this point of diversion.

There are also five approved points of diversion for underground water wells located within the White Horse Development. Table 1 summarizes these points and includes the water right number, owner, quantity of water allotted, and the beneficial use of each. Figure 2 shows where each of these points of diversion are within the White Horse Development.

Table 1: Summary of points of diversion within the White Horse Development

Water Right Number	Owner(s)	Quantity (acre-feet)	Beneficial Use(s)
51-7168 (a21671)	Ralph and Ronda Bennett	0.59	Stock & domestic
51-8826 (a44279)	Jane Ann and Rodney Carr	0.50	Stock
51-8217 (a37751) 1 of 2	Thomas Guy Larson	0.517	Irrigation
51-8217 (a37751) 2 of 2	Thomas Guy Larson	0.517	Irrigation
51-1791 (a44145)	Finch Family Properties, LLC	1.504	Stock & irrigation

These existing points of diversion could be used to the start drilling a new well and provide time to get a change application approved if the developer owned the property and water right. It is also important to check distance to the closest existing wells to avoid interference.

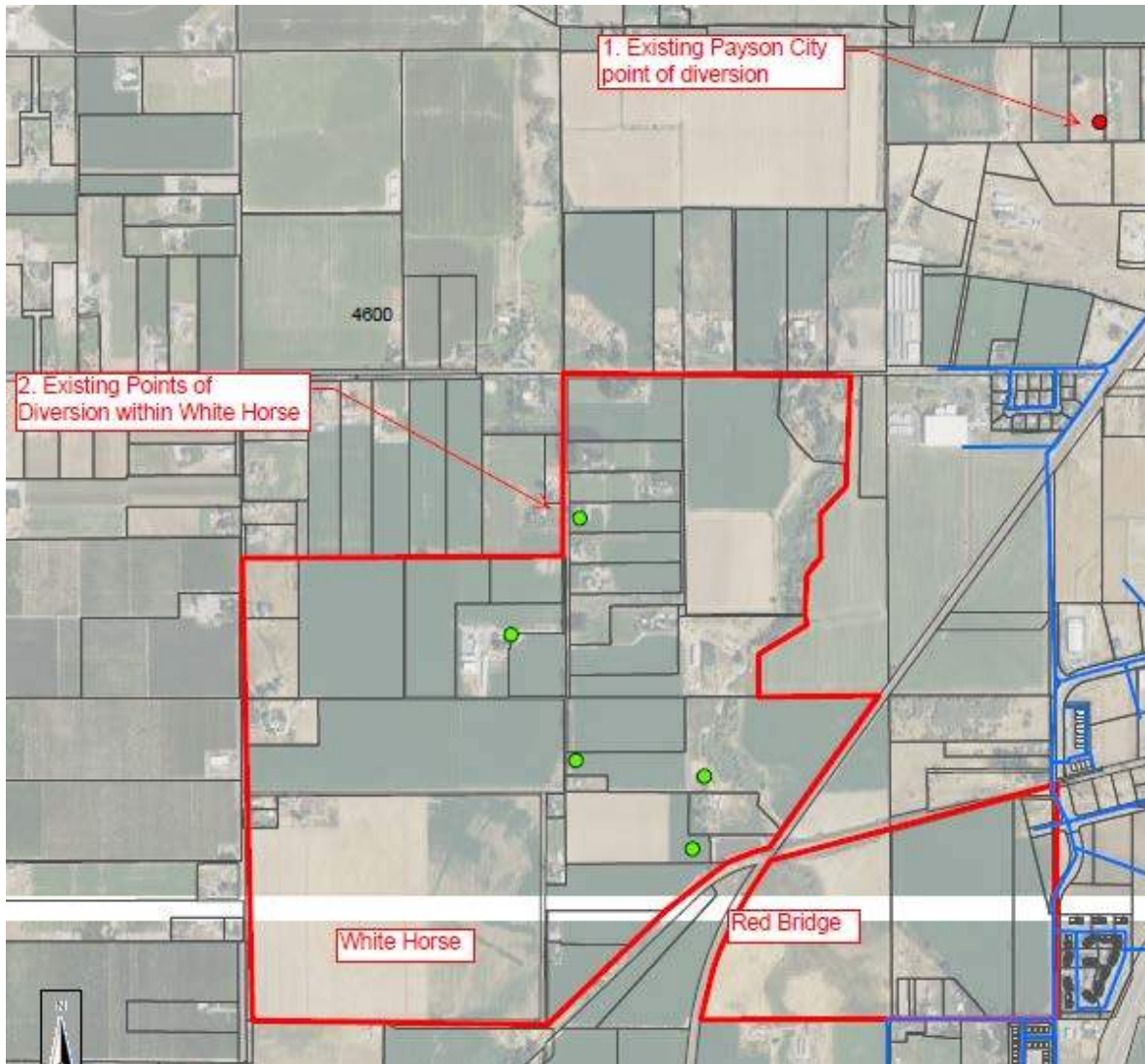


Figure 2: Points of diversion- Payson City and White Horse Development

Based on the approved points of diversion mentioned above and shown in Figure 2, it is recommended that the City not make use of any of these existing points of diversion. The City of Payson point of diversion is not on property owned by the City and is not close to existing pipes. The City would be required to buy the property, buy easements, and predict where future roads may be placed in order to connect the well to the existing pipe system. The points of diversion within the White Horse Development, though could offer a quicker well start-up if they were owned by the White Horse Development or the City of Payson. These points are also far from existing pipes.

The recommended approach is to locate the well close to the existing system with the optimal area shown on Figure 1 and file a change application as soon as the well site has been selected.

CONCEPTUAL WELL COST ESTIMATES

We estimate that the cost for drilling and constructing a 700-foot deep well with a 16-inch diameter casing and screen using the reverse mud rotary drilling method would cost

approximately \$700,000. Depending upon the type of building and the final equipped flow rate of the well, the pump station could cost approximately \$700,000. The cost of the pipeline will depend upon the distance from the constructed well to the existing pipeline, but is estimated to be less than \$100,000. Engineering fees for design and services during construction for the well, pump station, and pipeline is estimated to be \$280,000 for a total cost of approximately \$1.78 million. These cost estimates are conceptual in nature and may vary depending upon several factors.

SAMPLE WELL SITE PLAN

A sample well site plan has been provided for reference. The site plan provided is an ongoing well and pump house construction project in West Jordan, Utah. Based on this example, the approximate size of the Red Bridge PID well house should be about 0.25 acres. Figure 3 shows a typical layout of a well house site.

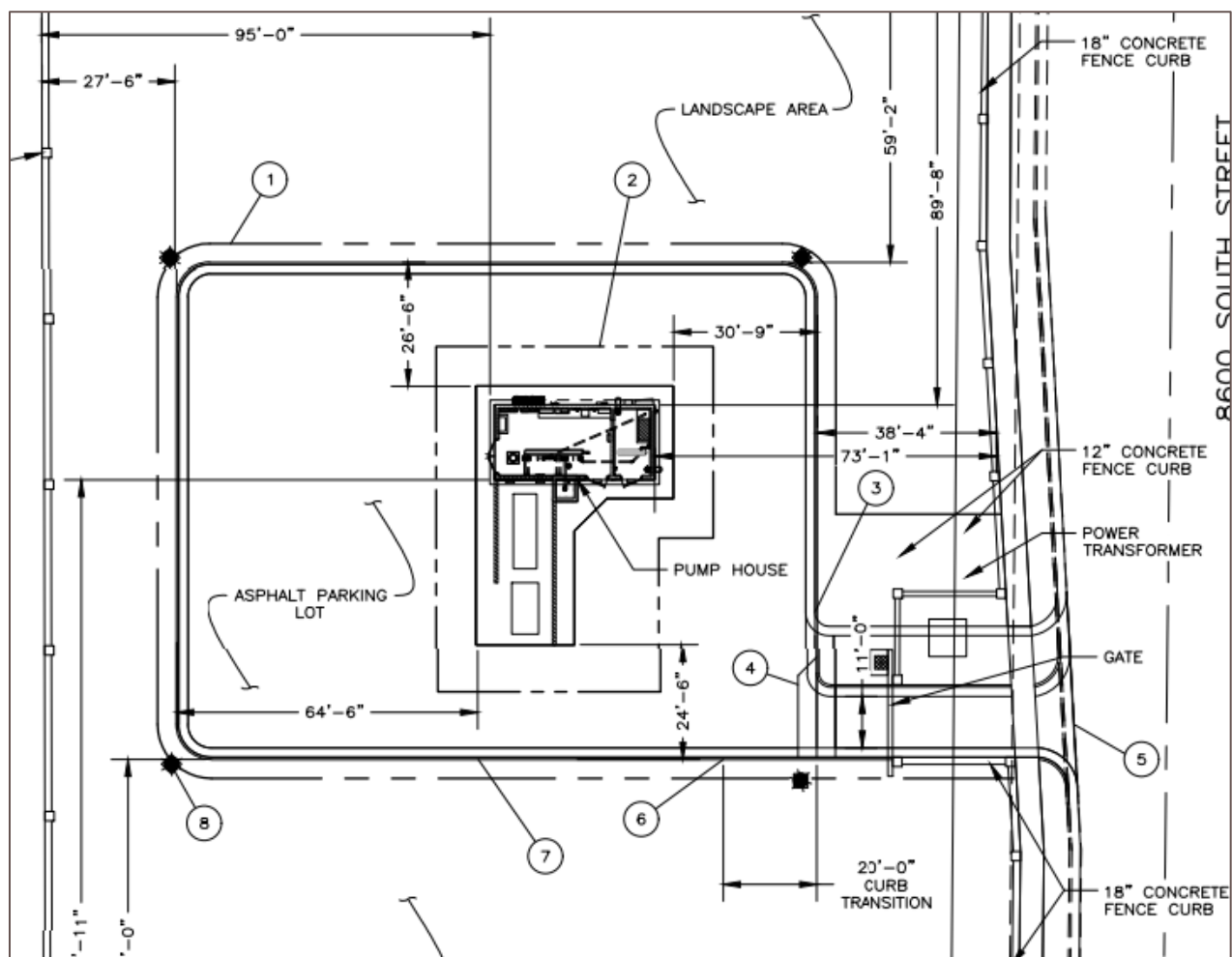


Figure 3: Well house for West Jordan site plan

SELECTED POINT OF DIVERSION LOCATIONS

Based on the recommendations provided above, three points of diversion have been selected within the Red Bridge PID. Figure 4 shows the location of these three points of diversion. Point of Diversion 1 (POD 1) is located approximately 300 feet north of 1130 South and 600 feet west

of 1700 West. Its proximity to the public street (1130 South) and the 12-inch pipeline running along 1130 South makes POD 1 a prime location for connecting the well to the Payson City drinking water system. Point of Diversion 2 (POD 2) is located approximately 400 feet north of 1130 South and 75 feet east of 1950 West. POD 2 is also in an ideal location for connecting to the 12-inch pipeline running along 1130 South and would require an additional 100-200 feet of pipeline construction when compared to POD 1. Point of Diversion 3 (POD 3) is located approximately 225 feet north of 1130 South and 75 feet west of 1950 West. The existing 12-inch pipeline running along 1130 South ends at the intersection of 1130 South and 1950 West. POD 3 is located northwest of this intersection and would require an additional 50-100 feet of pipeline constriction when compared to POD 1. POD 1 is located closer than both POD 2 and POD 3 to the 12-inch pipeline running along 1130 South. The preferred location of the well is POD 1 with POD 2 and 3 as alternatives.



Figure 4: Points of Diversion selected within the Red Bridge PID