

November 14, 2017

Mr. Peter Kampa  
General Manager  
Saddle Creek Community Service District  
1000 Saddle Creek Drive,  
Copperopolis, CA 95228

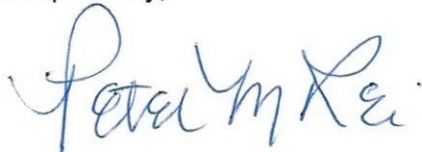
**Subject: PRELIMINARY DESIGN REPORT - Revised  
Saddle Creek CSD Street Rehabilitation Project**

Dear Mr. Kampa:

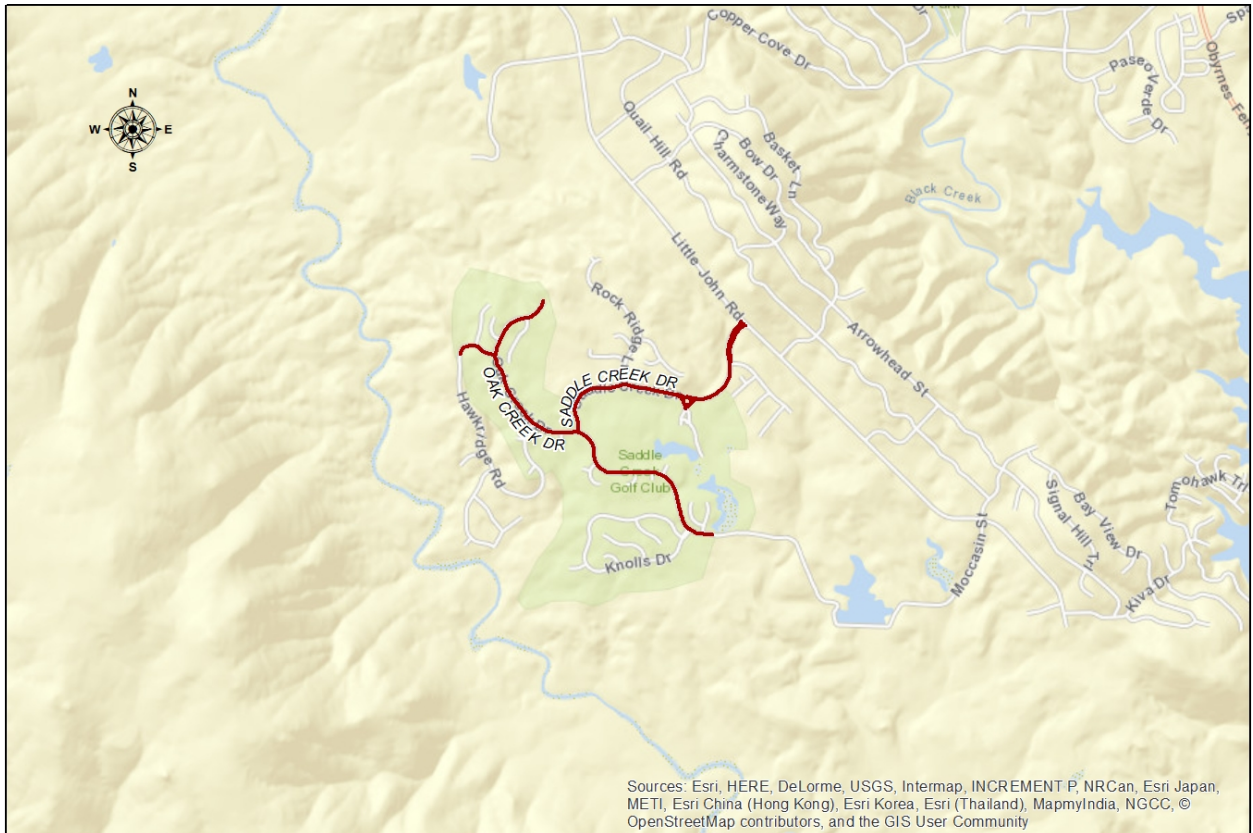
Willdan Engineering has prepared the following Preliminary Design Report for the subject project. This report is being submitted for review and approval. This project includes identifying appropriate, cost-effective asphalt concrete pavement rehabilitation on the following street segments: Saddle Creek Drive, Oak Creek Drive, the Resort Roundabout and Oakwood Place. See the following pages for project location maps. Pursuant to the scope of work, this report addresses the following design elements for the proposed street improvements:

1. Existing Conditions
2. Environmental Compliance
3. Utility Coordination
4. Traffic Handling/Construction Phasing
5. Street Resurface Design

Respectfully,



Peter Rei, P.E.  
Project Manager



**Figure 1- Project Location Map**

## Existing Conditions

As depicted in Figure 1 above, there are about 8 miles of asphalt roadways within the Saddle Creek subdivision. Several street segments included in this pavement rehabilitation project have varying degrees of distress as identified in the District's 2016 Pavement Condition Report: the average Pavement Condition Index (PCI) of the roads within the district is 62 as of May 2016, with 31.4% of the roadways classified as "Poor" or "Very Poor" conditions. The collector street average PCI was calculated to have a score of 53.

A driving/walking field review of these streets indicated that the PCI ratings are consistent with the distress patterns observed. Taking into account the street conditions relative to each other, and adding to that the typical usage for these segments, a prioritization has been applied for targeting the available street repair funding as follows:

- Top Priority: Saddle Creek Drive, including entrance from Little John Road.
- Second Priority: Oak Creek Drive
- Third Priority: All other streets

Each street segment has been reviewed to determine the best strategy and the most cost-efficient project limits to apply to the street improvement design.

## Existing Structural Section

The existing pavement structural conditions vary within the District. Discussion with District staff and field review to check depth of asphalt sections documented that these streets have not been rehabilitated since they were initially constructed. In addition, the existing pavement structural section of the roadways is not clearly known. Willdan will conduct field coring to confirm existing pavement structural sections. For this analysis, it was assumed that the asphalt sections are all a minimum of 3" depth over aggregate base, and much deeper in some places. Therefore, 3" minimum Asphalt Concrete over base over compacted subgrade is the base section used for preliminary design. The conclusions of this analysis may need to be adjusted once the coring of the pavement is completed and the true structural section is known.

## Selection of Roadways for Phase 1 Improvements

Collector roadways serve as the main roadways connecting residential neighborhoods to higher volume roadways, commercial centers, schools and shopping centers. They can be thought of as the branches on a tree leading to the trunk. Keeping collector roadways well maintained provides the maximum benefit to the greatest number of roadway users as compared with localized improvements to neighborhood streets and courts. For this reason, Willdan believes that the major focus of the Phase 1 pavement rehabilitation project should be on the District's collector roadways as the highest priority.

The two roadways that were considered collector roadways for the District's 2016 Pavement Condition Report are Saddle Creek Drive and Oak Creek Drive. These two roadways are the two most heavily travelled District roadways and provide access to all of the residential neighborhoods within the Saddle Creek development, the golf course and the District's maintenance facility. Saddle Creek Drive and Oak Creek Drive also experience the highest volume of heavy loads (garbage trucks, propane trucks, moving trucks etc.) which historically cause the most stress to flexible pavements such as residential asphalt roadways. After consideration of these factors Willdan recommends that the Phase 1 pavement rehabilitation project focus on improvements to Saddle Creek Drive and Oak Creek Drive as the highest priority.

It is also noted that a portion of the Resort Roundabout is located within Saddle Creek Drive and is also the main entry to the Saddle Creek Golf Course and Clubhouse. In recognition of this Willdan also recommends that the Resort Roundabout be included in the Phase 1 pavement rehabilitation project.

Willdan has also been made aware by District staff of three stormwater catch basins that have experienced settlement relative to the adjacent curb and gutter. One location on Saddle Creek Drive, one in the Resort Roundabout and one on Oakwood Place. In addition, there is one location on Oak Creek Drive near Grandview Court which has historically been a drainage problem. Willdan proposes to include these drainage improvements as part of the Phase 1 pavement rehabilitation project. As this stormdrain repair will require reconstruction of a portion of the curb, gutter and sidewalk on Oakwood Place, a resurfacing of Oakwood Place is also recommended following the repair of the stormwater catch basin on that roadway.

Based on our field observation, and the extent of deterioration of existing pavement structural section and research, Saddle Creek Drive and Oak Creek Drive can be separated into

management segments that require similar rehabilitation strategy. The management segment street limits are shown in Table 1 and Figure 2 below.

**Table 1 - Street Limits**

Section No	Street Name	Street limit	Street Section Area
1	Saddle Creek Dr.	Little John Road to Oak Creek Drive	126,000 SF
2	Resort Roundabout	At Saddle Creek Drive	11,200 SF
3	Oak Creek Dr.	750ft. northwest of Hawkrige Dr. to 150 feet east of Mitchell Lane	140,000 SF
4	Oak Creek Dr.	End to 750 feet northwest of Hawkrige Dr.	60,000 SF
5	Oakwood Place	Oak Creek Drive to Cul-de-Sac	24,000 SF
		Total Area:	374,000 SF

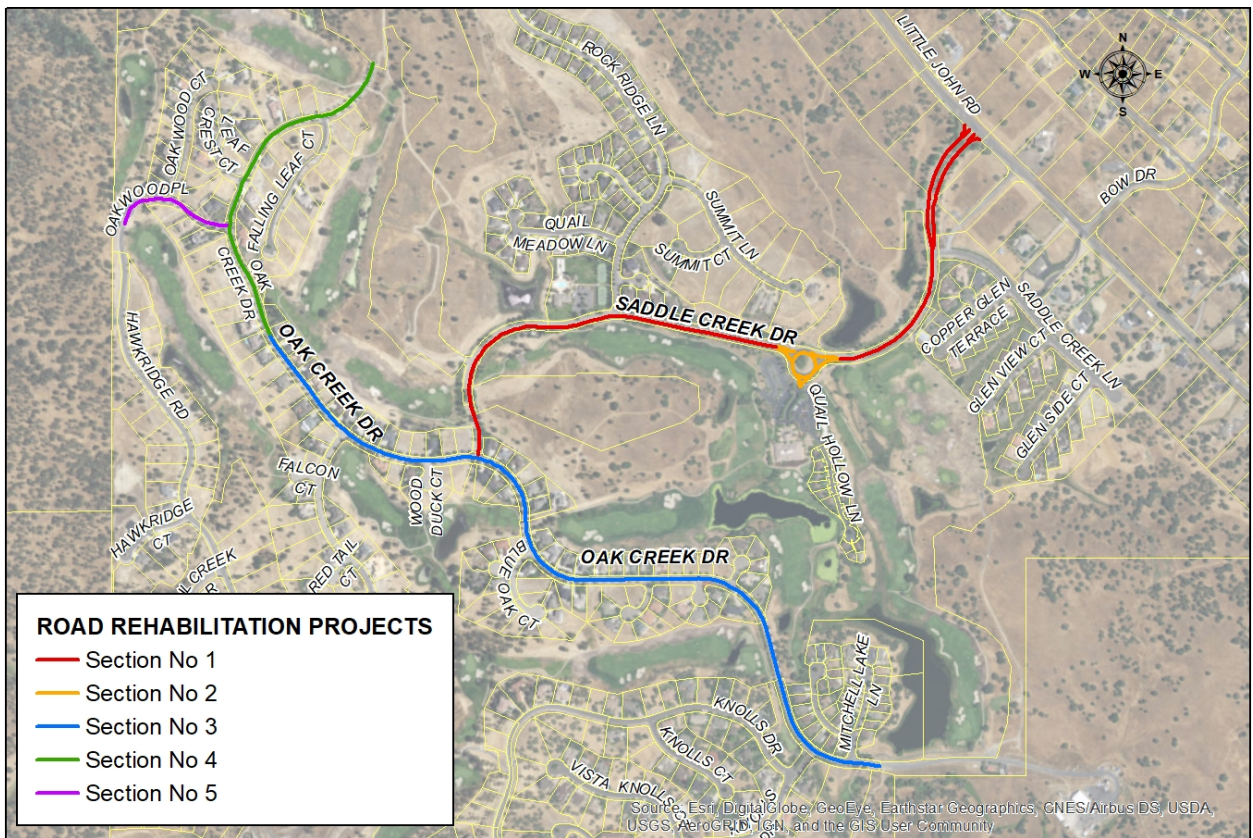


Figure 2- Street Segments 1 - 5

## Environmental Compliance

We understand the repairs to the identified street segments will be paid for using local District funds. As such, the California Environmental Quality Act (CEQA) criteria will be applied, more specifically, the application of provisions under Article 19 – Categorical Exemptions (CE). Willdan will prepare the Notice of Exemption Forms.

## Utility Coordination

Willdan will distribute preliminary utility notices to all locally identified utility providers and maintain a log of information received. We understand that there are water and sewer mains, laterals and a number of water valves along the project limits. We also understand that there is enough cover over the existing water and sewer lines and that road rehabilitation will not impact these lines. Water valve covers, stormdrain manholes, and sewer manholes will be adjusted to grade during roadway rehabilitation.

## Traffic Handling/Construction Phasing

Traffic control plans will be specified to be prepared by the Contractor and submitted to the District for approval prior to commencing construction. The traffic control plans will be location-specific, depicting the actual delineation on project limits and will address all turning movements, lane closures, etc. for each phase of construction. The project specifications will detail the minimum

lane width, allowable closures, detours, arrow board locations, flag men requirement, order of work, days and hours the work will be allowed to be performed.

The contractor will be required to maintain at least one lane of travel in each direction at all times during construction. Vehicular access to properties will be required to be maintained, except as required for intermittent construction immediately in front of driveways. Access to the Saddle Creek Golf Club and the Club House will be maintained during construction.

No overnight closure of any driveway will be allowed, except as permitted by the General Manager. Additionally, the contractor will be required to notify the affected property owners within 48 hours prior to any temporary obstruction of access. Notification shall include date, hours, description of work being performed and limitations. It is recommended that the District publish general information about upcoming street work in their local publications.

## Street Rehabilitation Design

Preliminary cost estimates have been prepared for a number of alternative reinforcement strategies that are commonly used to repair asphalt roadways. Cost saving strategies such as applying reinforcing layers to wheel paths, using inter layers for crack mitigation, or adding high tensile fibers to the asphalt mixture were analyzed. Each segment has been reviewed to determine the best strategy to apply.

## Evaluation of Alternatives

Based on recently approved projects in nearby Cities and similar project comparison, Willdan analyzed eight alternatives for the street resurfacing project:

- Option 1:** *Microsurfacing*
- Option 2:** *Recycled Asphalt Pavement Slurry with HPS No Track Tack coat membrane*
- Option 3:** *Chip Seal, with HPS No Track Tack coat membrane and Recycled Asphalt Pavement Slurry*
- Option 4:** *2" Cold Mill of existing pavement (with +/- 1% Remove and Replacement of failed asphalt section) and 2" Hot Mix Asphalt Cap Pavement with High Tensile Fiber*
- Option 5:** *Cold In Place Recycle of existing pavement and 2" Hot Mix Asphalt Cap Pavement*
- Option 6:** *2" Cold Mill (with +/- 1% Remove and Replacement of failed asphalt section), 3/4" Leveling Course, GlasPave Paving Mat, and 1.5" Hot Mix Asphalt Cap*
- Option 7:** *2" Cold Mill (with +/- 1% Remove and Replacement of failed asphalt section), 3/4" Leveling Course, GlasPave Paving Mat, and 1.5" Hot Mix Asphalt Cap Pavement w/High Tensile Fiber*
- Option 8:** *3" Hot Mix Asphalt over 6" Full Depth Reclamation (Full Segment)*

Based on our analysis Willdan has determined that the best and most effective street repair is a combination of:

1. Microsurfacing for street sections that have minor pavement cracking with little to no structural deformation of the roadway and,

2. Grinding of 2" of the existing asphalt and replacement with 2" of Hot Mix Asphalt (HMA) Cap pavement (with high tensile fiber mix) for street segments which have more advanced cracking and/or have begun to show signs of structural deformation.

With the relatively low traffic volume of the proposed street sections, Willdan believes that a combination of Microsurfacing treatment and Hot Mix Asphalt Cap pavement with high tensile fiber strategy, will insure the best cost/benefit ratio and will provide structural street sections that will last for years to come.

A table summarizing the proposed quantities and resulting costs of the recommended options is shown in Table 2. The assumed unit prices within these preliminary cost estimates are based on recent bid results for projects near the town of Copperopolis and throughout California.

Recommended options are highlighted in YELLOW, and then used to calculate the Subtotal for the Preferred Option calculation.

**Table 2 - Comparison of Estimated Construction Costs for Structural Section Alternatives**

Saddle Creek CSD Comparison of Segments and Costs														
Segment	Street	Limits	Area	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Remove and Reconstruct		Sub Total Preferred Option
				(Micro)	(Slurry)	(Cape)	(CAP w/HTF)	(CIPR)	(AC/Mat)	(HTF/Mat)	(FDR)	%	\$6.00	
		Strategy Unit Cost:	Sq.ft.	\$0.30 /sq ft	\$0.35 /sq. ft.)	\$0.70 /sq. ft.)	\$1.50 /sq. ft.)	\$1.73 /sq. ft.)	\$2.07 /sq. ft.)	\$2.27 /sq. ft.)	\$2.30 /sq. ft.)			
1	Saddle Creek Dr.	Little John Road to Oak Creek Drive	126,000	\$ 37,800	\$ 44,100	\$ 88,200	\$ 189,000	\$ 218,000	\$ 260,900	\$ 286,100	\$ 289,800	1.00%	\$ 7,600	\$ 196,600.00
2	Roundabout	At Saddle Creek Drive	11,200	\$ 3,400	\$ 4,000	\$ 7,900	\$ 16,800	\$ 19,400	\$ 23,200	\$ 25,500	\$ 25,800	0.00%	\$ -	\$ 16,800.00
3	Oak Creek Dr.	750 ft. northwest of Hawkrigde Dr. to 150 feet east of Mitchell Lane	140,000	\$ 42,000	\$ 49,000	\$ 98,000	\$ 210,000	\$ 242,200	\$ 289,800	\$ 317,800	\$ 322,000	1.00%	\$ 8,400	\$ 218,400.00
4	Oak Creek Dr.	End to 750 feet northwest of Hawkrigde Dr.	60,000	\$ 18,000	\$ 21,000	\$ 42,000	\$ 90,000	\$ 103,800	\$ 124,200	\$ 136,200	\$ 138,000	0.00%	\$ -	\$ 18,000.00
5	Oakwood Place	Oak Creek Drive to Cul-de-Sac	24,000	\$ 7,200	\$ 8,400	\$ 16,800	\$ 36,000	\$ 41,600	\$ 49,700	\$ 54,500	\$ 55,200	0.00%	\$ -	\$ 7,200.00
<b>Preferred Sub Total</b>													<b>\$ 457,000.00</b>	
<b>Supplemental Cost at 20%*</b>													<b>\$ 91,400.00</b>	
<b>Supplemental Drainage Improvement Cost (3 @ \$5,000 each)</b>													<b>\$ 15,000.00</b>	
<b>Sub-Total</b>													<b>\$ 563,400.00</b>	
<b>Contingency (10% to \$250K, 2.5% above)</b>													<b>\$ 32,835.00</b>	
<b>Grand Total (\$)</b>													<b>\$ 596,235.00</b>	

**\$ xx,xxx** Recommended Option

\* - Supplemental Cost includes Traffic Control, Signing/Striping, utility cover raising, mobilization and de-mobilization, Construction Survey, Water pollution Control, insurance etc.

\*\* - Supplemental Cost includes drainage structure improvements



## **Basis of Estimated Costs**

The assumed unit prices within these preliminary cost estimates are based on recent bid results for public agency projects near the town of Copperopolis and throughout California and include only the estimated construction costs. It is Willdan's understanding that design costs and bidding assistance costs are included within the previously approved Task Order #1. It is also Willdan's understanding that Construction Management costs will be handled through a separate Task Order once bid results have been received.

## **Preliminary Schedule**

Once approval of this Pre-Design Report and a Notice to Proceed is received by Willdan we will begin the final design process including preparation of the plans, specifications and final Engineer's Estimate of cost. Our expected schedule is as follows:

Receipt of Notice to Proceed from District:	Mid-November 2017
65% Plans/Specs:	January 1, 2018
95% Plans/Specs:	January 15, 2018
100% Plans/Specs ready for bids:	February 1, 2018
Bids Due:	April 1, 2018
Construction:	May/June 2018

## **Construction Management**

Discussions with District staff indicate that it may be possible to use a combination of District staff and Willdan staff to reduce the cost of Construction Management activities. If requested, Willdan will provide the District with an estimate of the costs to have Willdan staff perform the construction management responsibilities. However, no costs for Construction Management are included in this document pending further consultation with District staff.

## **Recommendations**

### Roadway Improvements

The recommendations provided herein are based on engineering judgment considering the local conditions and our extensive experience with pavement design throughout California. Based on our experience we have recommended the most cost-efficient pavement structural section that will provide a 10 to 20-year service life.

Considering that Saddle Creek Community Services District has limited funds available to rehabilitate the entire 8 miles of the paved roadway within the district, Willdan analyzed several different strategies for the most distressed roadway sections. These roadway sections exhibit varying levels of deterioration, with the deterioration of several portions of Saddle Creek Drive and Oak Creek Drive being the most concerning. With the available funds of \$600,000, it is anticipated that the entire length of Saddle Creek Drive and Oak Creek Drive can be rehabilitated during the Phase 1 pavement rehabilitation project.

It is also noted that a portion of the Resort Roundabout is located within Saddle Creek Drive and is also the main entry to the Saddle Creek Golf Course and Clubhouse. In recognition of this Willdan also recommends that the Resort Roundabout be included in the Phase 1 pavement rehabilitation project.

Due to needed repairs of a damaged storm drainage basin on Oakwood Place, which will require digging out the existing storm drain basin, and reconstruction of the curb, gutter and sidewalk adjacent to that basin, resurfacing of Oakwood Place is also recommended to provide a finished look to the area to be excavated.

Should there be funding available following construction of Phase 1, it is recommended that any remaining funds be directed at additional roadways in need of Microsurfacing/seal coats as part of a future Phase 2 project.

Willdan proposes to address some of the larger areas of asphalt failure with Asphalt Concrete “dig-out” repairs and skin patch repairs, prior to final surface paving. The quantity of pavement that requires dig-outs is relatively low, but reconstructing these sections will provide structural strength in the isolated areas where the existing asphalt section has begun to fail.

### Drainage Improvements

During our field observations with District staff we also noticed that three existing storm drain curb opening inlet structures are damaged. These three inlet structures will be removed as part of the Phase 1 project and reconstructed per the District's request. Based on field inspection, it was observed that the lateral culvert pipes do not appear to be damaged and will be protected in place. Only the concrete inlet structures will be removed and reconstructed, along with the adjacent curb, gutter and sidewalk.

District staff have also informed Willdan that there is a historical drainage problem on Oak Creek Drive just east of the intersection of Grandview Court, where there is a history of flooding in even moderate rain events. According to District staff the problem appears to be a crushed culvert pipe

located within Oak Creek Drive. Our construction plans will include the repair and/or replacement of this culvert so that this historic drainage problem is resolved.

During the field visit, it was also noted that the pavement finished grade is lower than the gutter lip at a few locations. After consultation with district it was decided that these sections will be left as is where ponding has not been an issue.

### Engineers Estimate of Probable Cost

As shown in Table 2, based on preliminary construction cost estimate for the recommended rehabilitation strategy for various segments, the Engineers Estimate of Probable Costs to resurface Saddle Creek Drive, Oak Creek Drive and Oakwood Place and to construct/repair the four drainage locations total approximately \$600,000.