



**CLARK CIVIL ENGINEERING**  
**ENGINEERING • SURVEY • CONSULTING**

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PH: 415-295-4450 FAX: 510-372-0259

## UTILITIES ASSESSMENT

Prepared for: Tamalpais Union High School District  
333 Doherty Drive  
Larkspur, CA 94977

June 1, 2021



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### EXECUTIVE SUMMARY:

At the request of the district, Clark Civil Engineering, has performed an assessment of the following school sites in the Tamalpais Union High School District- Tamalpais High School, Archie Williams High School (formerly Drake HS), Redwood High School- including Tamiscal High School and San Andreas High School and the Red Hill Sports Complex. The purpose of the assessment was to review the utilities of each school site and provide recommendations for repairs.

A thorough review of the as built drawings was performed as well as an interview with the facilities manager and a walking review of each school site. This assessment is made for the utilities throughout the site to the exterior of the buildings. No assessments were made to the interior of the school buildings. This assessment excludes irrigation as that will be covered in a separate assessment done by Vallier Design Associates, Inc.

### HISTORY OF CONSTRUCTION:

Tamalpais High School  
700 Miller Avenue  
Mill Valley, CA 94941

- The original campus was built in 1922
- Additions were made to the campus throughout the 1930s through the 1970s
- Campus modernization and upgrades were made in the 2000s, which included storm and sewer repair and upgrades.





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Archie Williams High School (formerly Drake HS)  
1327 Sir Francis Drake Boulevard  
San Anselmo, CA 94960

- The original campus was built in 1951
- Additions were made to the campus from 1956 through the 1960s
- Campus modernizations and upgrades were made in the 2000s





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**Redwood High School**  
395 Doherty Drive  
Larkspur, CA 94939

- The original campus was built in 1958
- Campus modernizations and upgrades were made in the 2000s
- Tamiscal High School a small alternative program opened in 1990 adjacent to the Redwood campus.
- San Andreas High School a small continuation high school opened in 1993 adjacent to the Redwood campus.





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Red Hill Sports Complex  
198 Shaw Drive  
San Anselmo, CA 94960

- Opened in 2009



Our assessment of Red Hill Sports Complex is limited. As it has the newest construction it does not have any major issues discovered at the site walk. The sanitary sewer system and the storm water drainage system are fully functional. The sports fields are of synthetic construction so there is limited water supply systems at the site. The water district's leak detection equipment has not detected any leaks at this time, therefore we do not have any proposed repairs at this time and will not be discussed further in this assessment.



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### EXISTING CONDITIONS:

At the Tamalpais, Archie Williams and Redwood High School Sites

#### Storm Water Drainage Systems

A visual inspection of the storm water drainage system was done at all sites covered by this assessment. At each site the storm water drainage system is original construction, with new connections made to the systems as new additions were made to each campus. At every site the storm water drainage system is older, but in good working order with no visible issues. In addition, there are no major drainage problems and no other evident problems were noted during interview with the facilities manager.

#### Sanitary Sewer Systems

Upon walking each school site, the sanitary sewer systems are also original construction with new connections made to the systems as new additions were made to each campus. At all sites the sanitary sewer system is older but in serviceable condition. No significant issues were noted at the site walk nor during the interview with the facilities manager. At Redwood and Tamiscal school sites there are sewer ejectors that have been maintained and will continue to need maintenance.

#### Water Supply Systems

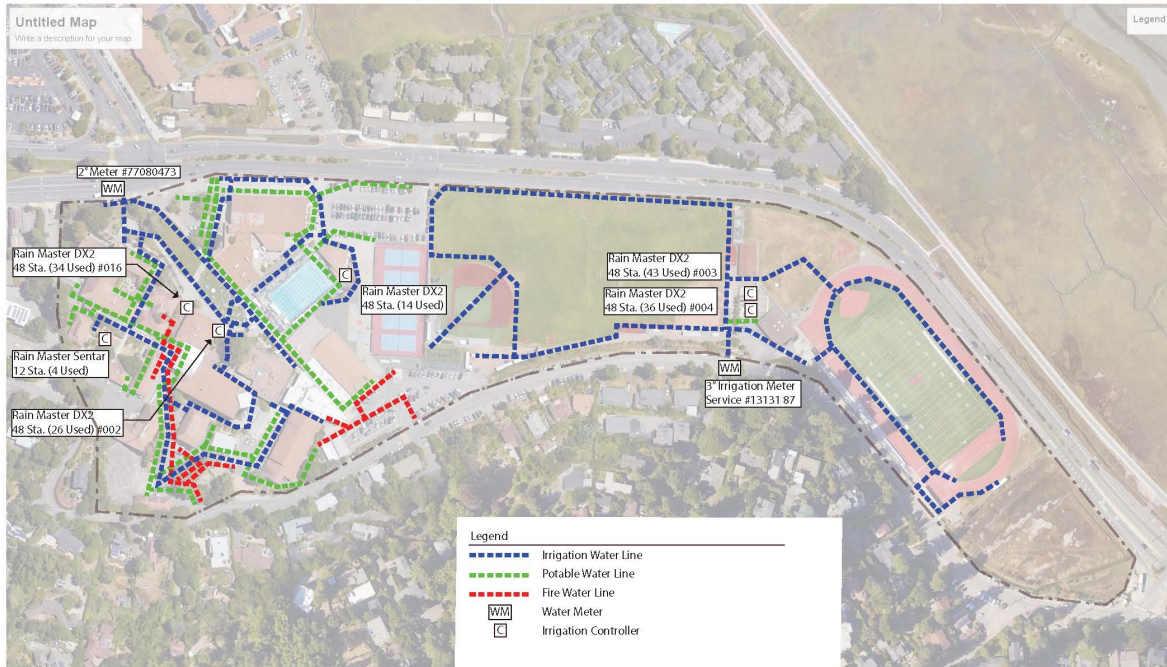
At each school site all of the water supply systems are original construction and are deteriorating due to age and use. Several meters are experiencing significant leaks according to the Marin Municipal Water District's leak detection estimator. At the Archie Williams school site the domestic water services locations are unclear due to lack of information on the as built drawings.



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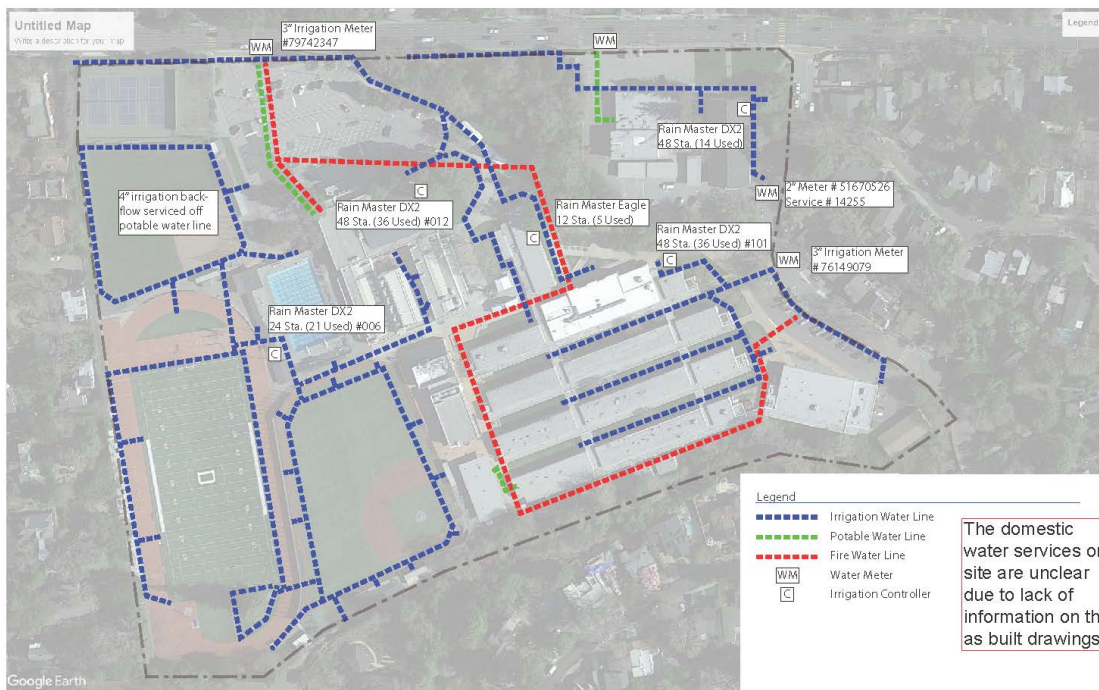
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## Tamalpais High School Overall Site Water Plan

May 26, 2021  
 SHEET NO.  
 1 of 1



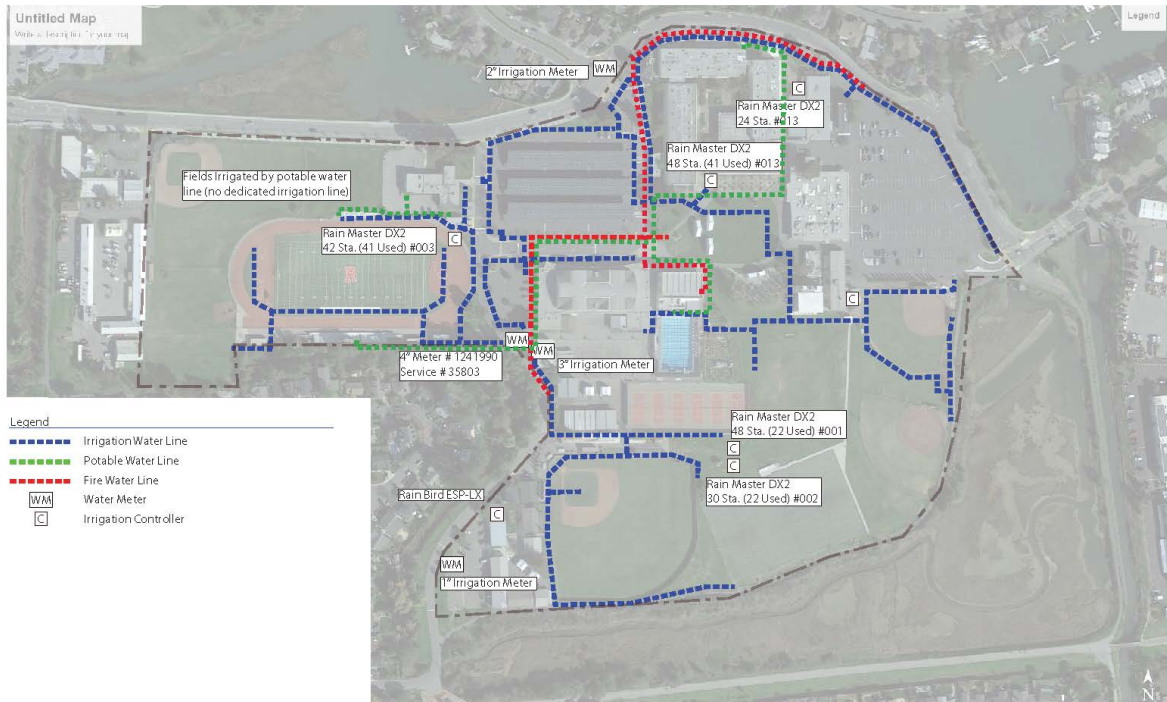
## Archie Williams High School (formerly Sir Francis Drake) Overall Site Water Plan

May 26, 2021  
 SHEET NO.  
 1 of 1



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### Redwood High School Overall Site Water Plan

May 26, 2021

SHEET NO.  
1 of 1

## RECOMMENDATIONS:

At the Tamalpais, Archie Williams and Redwood High School Sites:

### Storm Water Drainage Systems

Even though the storm water drainage systems at the school sites are older they are still in good working order. Continued infrastructure maintenance as needed will keep the systems functioning as intended. Clear all storm drain inlets of debris and sedimentation yearly or as required and periodic use of a roto-router and/or video inspection service may be needed. No major repairs proposed.

### Sanitary Sewer Systems

All sanitary sewer systems at the school sites are in older but serviceable condition and no major repairs are proposed. The sewer ejectors need to continue to be maintained and repaired regularly at the Redwood and Tamiscal school sites. Periodic use of a roto-router and/or video inspection service may be needed. No major repairs proposed.



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### Water Supply Systems

All of the school sites have continual water leakage problems. At Tamalpais and Archie Williams High Schools, there are supposed to be dedicated irrigation meters but it appears at multiple areas there are connections to the domestic service. At Redwood High Schools it appears that there are no domestic connections off of the dedicated irrigation meters, but further investigation may be warranted.

While the main recommendation is to replace the domestic water supply system, this can be extremely costly and take a significant amount of time to complete this project all at once. Complete replacement of the domestic water lines should be done in phases.

However, with the large quantities of water leaking from the systems it is recommended that immediate action be taken to determine the locations of leaks and repair major leaks as soon as possible, given the state of the water needs in the community. A plumbing contractor should be hired to install and/or repair isolation valves and flow gauges. These could then be used to isolate segments of the system to find where leaking is present and the extent of the leak in each branch. This work should be done in conjunction with the site staff, civil engineer and landscape architect working on the same approach with the irrigation system. Once the extent and locations of the leakage is determined, the phasing of the replacement of the water system can be planned and scheduled.

The sites should have an unground utility locator do location of the main water lines in the site to confirm and map the system. Archie Williams is a site that has a very limited amount of historical data so it is difficult to locate the water mains based on the as built drawings. Locations costs could be \$25,000 to \$35,000 per site, plus additional cost for survey crew to locate and map on the plans.

Below are specific issues that need to be addressed in the isolation and investigation of the leaks.

- Tamalpais - verify that separation of the irrigation and domestic water system are in two separate the systems.
- Archie Williams- There is a potential that there are domestic water connections off of the fire service lateral or has leak based on the volume of water on the meter. It should be verified that the there are no domestic water connections off of the dedicated fire system.
- Redwood - verify there are no domestic connections to fire line.
- Each building on each site should be inspected and reviewed to see if there are fixtures leaking or using excessive water.

It is estimated that to add isolation valves and/or repair existing isolation valves and determine the extent of the leaks at each campus would be:

|                     |           |
|---------------------|-----------|
| Tamalpais HS:       | \$150,000 |
| Archie Williams HS: | \$180,000 |
| Redwood HS:         | \$150,000 |

The cost of the phase one repair would be determinate to the extent of the leaking that is found.



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The estimation of the second phase, the full replacement of the water systems on the site are as follows (note this could vary due to extent of work required):

|                     |           |
|---------------------|-----------|
| Tamalpais HS:       | \$250,000 |
| Archie Williams HS: | \$220,000 |
| Redwood HS:         | \$250,000 |

These estimates assume the replacement as one project at each site and not phasing of the work. The extent of phasing is difficult to determine at this time and can be better determined after the initial leak reparations are made. There yearly cost escalation and potential phasing of the work should factored in to the cost above.

Additionally, some sub-metering could be installed at key locations to try and address locating and detecting future leaks. The potential of partnering with the water district on this should be further explored, as the water district has in place a leak detection program already. A general audit of the amount of water used would be recommended to see if there is equipment that is not running correctly and could be repaired or replaced to reduce overall consumption.