

TECHNICAL MEMORANDUM

**Cedar Suites & Willow Creek Staff Housing
Infrastructure Assessment**

PREPARED FOR: Tina Andersen, T&B Planning
PREPARED BY: Evan Cochran & Andrew Willrodt, Fuscoe Engineering, Inc.
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I. PURPOSE AND INTRODUCTION

The purpose of this memorandum is to evaluate infrastructure impacts (hydrology, water quality, water, and sewer) related to the Mitigated Negative Declaration (MND) for the joint Cedar Suites & Willow Creek Staff Housing project within the unincorporated community of Lake Arrowhead, California.

II. CEDAR SUITES PROJECT SUMMARY

Cedar Suites Project Description:

This project would construct two new guest cottages at the UCLA Lake Arrowhead Lodge to provide accommodations for conference and transient business throughout the year. The 2-story guest cottage buildings known as "Cedar Suites" would be approximately 4,750 square feet in total with 12 hotel-style private guest rooms to accommodate a total of 24 guests. Each room would be double occupancy but could be adapted for use as the suite-style of "Condolet" typical at UCLA Lake Arrowhead Lodge. The new buildings would not exceed the height of the existing Cedar Lodge, which is 40 feet.

The proposed project site sits near the eastern edge of the UCLA Lake Arrowhead Lodge property, currently the location of Cedar Lodge, an existing 8,470 square foot, 3-story building used primarily for summer staff housing, with an existing 1,320 square feet multi-purpose gathering space that is used year-round. Cedar Lodge, which was originally constructed in 1939, was determined to have a Seismic Performance Rating of VI and is therefore scheduled to be demolished as part of Housing & Hospitality's plan to address deficient properties in accordance with the UCOP Seismic Safety Policy. Once alternative staff accommodations are constructed at the Willow Creek site, Cedar Lodge would be demolished and the new Cedar Suites would be developed on the site.

Project Justification:

UCLA Lake Arrowhead Lodge provides guest accommodations and conference space. The Lodge currently has a shortage of overnight guest accommodations compared to the current conference capacity of 225 guests. The proposed project would add 12 guestrooms to help address the shortage. According to recommendations outlined in the 2019 Development Study (908026), conference clients also prefer having an option for hotel-style single guestrooms, which are more private than UCLA Lake Arrowhead Lodge's typical multi-bedroom Condolets; this proposed development would address that need as well.

The proposed Cedar Suites guestrooms would remain adaptable for use as suite-style Condolets during the summer months to also expand guest capacity for the UCLA Bruin Woods Family Resort, which always has a long waiting list.

Staging Impacts:

Minimal impact to the UCLA Lake Arrowhead Lodge operations is anticipated; current operations in the work area will be relocated to another facility prior to the commencement of demolition and construction. Construction would occur in areas not currently used for programmed activities, and thus would not impact normal conference functions.

Schedule:

Construction is planned to start in May 2023 and complete in March 2025.

III. WILLOW CREEK STAFF HOUSING PROJECT SUMMARY

Project Description:

This project, proposed by Housing and Hospitality, would construct approximately 10,000 square feet of modular prefabricated housing and multi-purpose space for Bruin Woods staff, to replace the existing staff housing accommodations at Cedar Lodge, which is planned to be demolished.

Accommodations would house UCLA Lake Arrowhead Lodge Bruin Woods seasonal staff—UCLA student camp counselors—during the annual Bruin Woods summer camp and would be offered as a lower-cost accommodation option for conference and resort guests during the remainder of the year. The approximately 10,000 square feet, two-story building would include 18 rooms with in-suite bathrooms, each designed to accommodate up to 3 staff members, for a total occupancy of 54. The height of the new building will be approximately 40 feet. The scope would also include approximately 1,320 square feet of meeting space to replace the existing 1,320 square feet meeting space in Cedar Lodge, which would serve as social space for seasonal staff and as meeting space during conference season.

The project site sits along Willow Creek Road and is approximately 215 feet long and 40 feet wide and is currently a paved parking and service area. Demolition of the existing 2,220 square feet maintenance building (21 feet height) and other accessory structures on the proposed site and redevelopment of the existing parking area will be included in the project. The existing storm drain that extends under the northern portion of the proposed building would be retained in place.

Project Justification:

Summer employees—comprising some 54 university students who serve as camp counselors and support staff—are housed on-site at Cedar Lodge, an existing 8,470 square foot, 3-story building with 21 sleeping rooms and a 1,320 square foot multi-purpose gathering space.

Cedar Lodge is scheduled to be demolished as part of Housing & Hospitality's plan to address deficient properties per the UCOP Seismic Safety Policy, necessitating the development of alternative staff accommodations. The existing gathering space at Cedar Lodge is also currently one of the largest meeting spaces on property and will thus need to be replaced to maintain conference functions. The existing structure was determined to have a Seismic Performance Rating of VI and has been partially retrofitted to a Seismic Performance Rating of V for diminished temporary use until alternative staff accommodations can be developed.

Staging Impacts:

Minimal impact to the UCLA Lake Arrowhead Lodge operations is anticipated; current operations in the work area will be relocated to another facility prior to the commencement of demolition and construction. The existing Cedar Lodge building has been retrofitted for diminished temporary use until the Willow Creek project is completed. Construction would occur in areas not typically used for programmed activities, and thus would not impact normal conference functions.

Schedule:

Construction is planned to start in July 2022 and complete in May 2023.

IV. HYDROLOGY AND DRAINAGE CONDITIONS

Under the existing conditions, the site currently sits inscribed in one larger 57,935 square foot drainage area that sheet flows to Willow Creek Road—there is no subterranean storm drain infrastructure in the subarea. The existing site is split up into three drainage areas (A-1, A-2, and A-3). The A-1 drainage area (where the current Cedar Lodge sits) drains to an 8-inch CMP culvert outlet that daylights in the parking lot below. It then sheet flows into the R/W and north into the existing catch basin at the northerly corner of the site. The existing parking lot and maintenance building in subarea A-2 as well as the vegetated hillside in subarea A-3 also sheet flow into the R/W and into the existing northerly catch basin.

The existing catch basin in Willow Creek Road routes all surface runoff via a 36-inch culvert under Willow Creek Road ultimately discharging into Willow Creek to the east. As shown in **Appendix D**, Willow Creek routes north joining with Deep Creek eventually discharging into the Mojave River Basin north of the San Bernardino Mountain range.

The proposed project will maintain the same drainage pattern and subareas to convey excess stormwater to Willow Creek Road. The proposed project will construct new drainage features as shown in **Appendix E** to convey stormwater flows. The difference in imperviousness between existing and proposed condition is shown in Table 1 below:

Table 1: Existing Versus Proposed Site Imperviousness

Condition	Total Area	Impervious Area	Impervious Area Percentage
Existing Condition	1.45 ac (63,050 sf)	33,395 sf ¹	53%
Proposed Condition	1.45 ac (63,050 sf)	31,664 sf ²	50%
Difference	0	- 1,731 sf	- 3%

¹ Existing 33,395 SF of impervious area includes Buckhorn Building roof area (2,009 SF), Cedar Lodge roof area (4,010 SF), maintenance building roof area (2,220 SF), and existing pavement area (25,156 SF).

² Proposed impervious area includes both Cedar Suites "Condolets" roof areas and balconies (total of 3,748 SF), Willow Creek staff housing roof area (5,930 SF), proposed pavement and walkway areas (3,968 SF), existing Buckhorn building roof area (2,009 SF), and existing parking lot area (16,019 SF).

Overall, the decrease in imperviousness would result in a decrease in peak flow runoff; therefore, no impacts to storm drain infrastructure are anticipated.

V. WATER SERVICES

Water Infrastructure:

The existing Cedar Lodge facility is served by the Lake Arrowhead Community Services District ("District"). The District provides water service to the Lake Arrowhead community and

wastewater services to customers in the Lake Arrowhead and surrounding communities. Today, the District serves approximately 8,500 water connections and 10,500 wastewater connections. The District operates two water treatment plants, 19 water pumping stations, two wastewater treatment plants, 21 wastewater pumping stations, 20 reservoir tanks and several hundred miles of pipelines.

The project has an existing 2-inch water service lateral branching off the existing 6-inch onsite private water main (main size to be verified in field). The existing private water main ties into the existing public 8-inch water main in Willow Creek Road at a vault southeast of the project area.

The proposed Cedar Suites project will connect via a new 2-inch branch service lateral off the existing onsite private water main with subsequent new 1-inch individual connections to each of the 2 new buildings (i.e. Cabin 1 and Cabin 2.) See **Appendix F** for the existing and proposed utility site plan. The proposed Willow Creek Staff Housing project will also connect with a new 2-inch branch service lateral off the existing onsite 6-inch main. See **Appendix F** for existing and proposed utility site plan. Water utility demands will be finalized during design.

Cedar Suites Water Demands Summary:

As noted above, the existing 8,470 square feet Cedar Lodge structure will be demolished and replaced with two proposed lodges totaling 4,750 square feet with 12 hotel-style private guest rooms to accommodate a total of 24 guests.

To estimate changes in water demands from the proposed project, existing and proposed water demands are estimated in **Table 2**. As no Lake Arrowhead water duty factors were available, the City of San Bernardino Water Master Plan water duty factors were utilized. Residential low water duty factors were employed for the lodging and general commercial were utilized for the existing maintenance area as well as the proposed multi-purpose use. Maintenance and multi-purpose land uses do not have separate water duty factors; the commercial water duty factor was selected to represent the non-residential land uses associated with existing and proposed conditions.

Willow Creek Staff Housing Water Demands Summary:

As noted above, the 2,220 square foot maintenance structure will be demolished and replaced with a 10,000 square foot modular prefabricated housing and multi-purpose space for Bruin Woods staff. The 10,000 square foot, two-story building would include 18 rooms with in-suite bathrooms for 54 guests as well as 1,320 square feet of meeting space.

To estimate changes in water demands from the proposed project, existing and proposed water demands are estimated in **Table 2**. As no Lake Arrowhead water duty factors were available, the City of San Bernardino Water Master Plan water duty factors were utilized. Residential low water duty factors were employed for the lodging and general commercial were utilized for the existing maintenance area as well as the proposed multi-purpose use. Maintenance and multi-

purpose land uses do not have separate water duty factors; the commercial water duty factor was selected to represent the non-residential land uses associated with existing and proposed conditions.

Water Demand Calculations Summary:

Table 2: Estimated Water Demand

Land Use	Acreage	Water Demand Factor	Water Demand
Existing			
8,470 SF Cedar Suites Lodge	0.19 ¹	2,594 gpd/acre	493 gpd
2,200 SF Maintenance Area	0.05 ¹	2,574 gpd/acre	129 gpd
Total Existing Water Demand			622 gpd
Proposed			
4,750 SF New Lodges (24 guests)	0.11 ¹	2,594 gpd/acre	285 gpd
10,000 SF modular residences (54 guests)	0.23 ¹	2,594 gpd/acre	597 gpd
1,320 sf multi-purpose space	0.03 ¹	2,574 gpd/acre	77 gpd
Total Proposed Water Demands			959 gpd
Total Proposed Water Demands with 20% SB-7-7 reduction + CA Green Building Code			767 gpd

¹ The acreages utilized to estimate water demands only account for areas of the project that generate water demands and do not include walkways and other similar impervious features.

As shown above, existing total water demands are estimated to be 622 gpd. Proposed water demands following the same methodology are estimated to be 959 gpd suggesting an increase of 337 gpd. However, per the District's 2015 and 2020 UWMP, the District is required to reduce water demands by 20% by 2020. The water duty factors implemented in this analysis are from the City of San Bernardino Water Master Plan which was published in 2015 and utilized data from 2007. Therefore, proposed water demands should include a 20% reduction to meet this goal. In addition, California Green Building Code requires low flow fixtures that will reduce water demands as compared to the outdated fixtures currently at the project site. Therefore, it is anticipated that the project will increase water demand by approximately 145 gpd. Overall, despite increasing the water demand, the proposed project should not impact the existing 6-inch onsite private water main or the existing 8-inch public main in Willow Creek Road.

VI. SEWER SERVICES

Sewer Infrastructure:

The Lake Arrowhead Community Services District (“District”) also provides wastewater services to Lake Arrowhead including the proposed project. The existing Cedar Lodge is served by a 6-inch sewer lateral that connects to an existing public sewer manhole in Willow Creek Road.

The proposed Cedar Suites project will remove the existing 6-inch sewer lateral and replace with a new 6-inch sewer lateral as shown in **Appendix F**. The proposed 6-inch lateral will serve both Cedar 1 and Cedar 2 with a second 6-inch lateral from Cedar Lodge 2 that shall connect to the proposed lateral extension. See **Appendix F** for the existing and proposed utility site plan.

Regarding the proposed Willow Creek Staff Housing units, the modular structure will tie into an existing manhole in Willow Creek Road via a single 8-inch house connection as shown in **Appendix F**.

Cedar Suites Sewer Flows:

As noted above, the 8,470 square feet Cedar Lodge structure will be demolished and replaced with two proposed lodges totaling 4,750 square feet with 12 hotel-style private guest rooms to accommodate a total of 24 guests.

To estimate changes in sewer flows from the proposed project, existing and proposed sewer flows are estimated in **Table 3**. As sewer flows and water demands are similar, the same methodology to estimate water demands was employed to estimate sewer flows. This approach is consistent with other agencies within Southern California (e.g. City of Los Angeles).

Table 3: Estimated Sewer Flows

Land Use	Acreage	Sewer Demand Factor	Sewer Flows
Existing			
8,470 SF Cedar Suites Lodge	0.19 ¹	2,594 gpd/acre	493 gpd
2,200 SF Maintenance Area	0.05 ¹	2,574 gpd/acre	129 gpd
Total Existing Sewer Flows			622 gpd
Proposed			
4,750 SF New Lodges (24 guests)	0.11 ¹	2,594 gpd/acre	285 gpd
10,000 SF modular residences (54 guests)	0.23 ¹	2,594 gpd/acre	597 gpd
1,320 sf multi-purpose space	0.03 ¹	2,574 gpd/acre	77 gpd
Total Proposed Sewer Flows			959 gpd
Total Proposed Sewer Flows with 20% SB-7-7 reduction + CA Green Building Code			767 gpd

¹ The acreages utilized to estimate sewer flows only account for areas of the project that generate sewer flows and do not include walkways and other similar impervious features.

As shown above, utilizing the City of San Bernardino Water Master Plan yields an increase in sewer flows of 337 gpd. However, as noted above in the water section, this increase is not representative of recent water conservation efforts throughout the state of California which has shown to decrease water demands as well as local and regional sewer flows. Therefore, the project will not impact infrastructure capacity to convey sewer flows.

VII. SURFACE WATER QUALITY REQUIREMENTS AND MS4 COMPLIANCE

San Bernardino MS4 Permit Overview:

The 2013 Phase 2 Small MS4 Permit issued by the State Water Resources Control Board (SWRCB) and overseen by the Lahontan Regional Water Quality Control Board, requires all new development and significant redevelopment projects to incorporate Low Impact Development (LID) Best Management Practices to the maximum extent practicable (MEP). In addition, the Phase 2 MS4 Permit also requires development of a standard design and post-development best management practice (BMP) guidance for incorporation, where feasible and applicable, of site design/LID, source control, and treatment control BMP (where feasible and applicable) to reduce the discharge of pollutants to receiving waters. Per **Appendix D** and **Appendix E**, Willow Creek will receive all stormwater runoff from the project site and eventually outfall into the Mojave River Basin at the north side of the San Bernardino Mountains.

Regarding LID practices specifically, the 2013 Phase 2 MS4 permit requires project proponents to first consider preventative and conservation techniques (e.g., preserve and protect natural features to the maximum extent practicable) prior to considering mitigative techniques (structural treatment, such as infiltration systems). The mitigative measures should be prioritized with the highest priority for BMPs that remove storm water pollutants and reduce runoff volume, such as hydrologic source control and infiltration, then other BMPs, such as harvesting and use, evapotranspiration and biotreatment should be considered. To the maximum extent practicable, these LID BMPs must be implemented at the project site. The Regional Board recognizes that site conditions, including site soils, contaminant plumes, high groundwater levels, etc., could limit the applicability of infiltration and other LID BMPs at certain project sites. Where LID BMPs are not feasible at the project site, more traditional, but equally effective control measures should be implemented. Where preferred LID BMPs are infeasible, the Permit provides for alternatives (SWRCB Order 2013-0001-DWQ NPDES No. CAS000004, Section F.5.g.3).

Post-Construction BMP Selection:

Per Form 2.1-1 in the Mojave River Watershed WQMP Template, LID BMPs will be required since the proposed development will exceed the addition and/or replacement of 5,000 square feet of impervious area. Per **Appendix D**, there are three impacted drainage subareas corresponding with the Cedar Suites and Willow Creek Staff Housing respectively. Using the TGD methodology for determining the 85th percentile storm event volume, subarea A-1 will need to treat approximately 1,400 cubic feet of stormwater while subarea A-2 will need to treat approximately 1,700 cubic feet of stormwater—the varying volume determinations being driven by the impervious area differences. The project proposes to remove approximately 1,411 square feet of pavement from subarea A-3, therefore, no BMPs are proposed for subarea A-3. Per the geotechnical report from Geotechnologies, Inc. dated July 9, 2021, the site is mantled with a thin cover of fill soil and natural colluvium over granite bedrock varying in depth from 1.5 to 4 feet. Consequently, storm water infiltration is not a suitable BMP strategy given the shallow depth of impervious bedrock. Likewise, given the small area of each subarea, harvest and use strategies will be infeasible. Therefore, the project may pursue a volume-based planter biofiltration BMP system or proprietary flow through biofiltration BMP. Additional details will be provided within the project-specific WQMP as required by the County.

Per the Phase 2 Permit, if on-site BMPs are infeasible, the project may consider alternative post-construction measures in-lieu of some or all the requirements to support multiple benefit projects. Concerning BMP maintenance, all BMPs shall be maintained per the San Bernardino TGD for Water Quality Management Plans as well.

Construction Related Stormwater Pollution NPDES Nationwide Permit Applicability:

Clearing, grading, excavation and construction activities associated with the proposed project may impact water quality due to sheet erosion of exposed soils and subsequent deposition of particulates in local drainages. Particularly, grading activities lead to exposed areas of loose soil, as well as sediment stockpiles, that are susceptible to uncontrolled sheet flow. Although

erosion occurs naturally in the environment, primarily from weathering by water and wind action, improperly managed construction activities can lead to substantially accelerated rates of erosion that are considered detrimental to the environment.

Prior to the issuance of grading permits, the project applicants shall provide evidence that the development of the projects one acre or greater of soil disturbance shall comply with the most current Construction General Permit (CGP) (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ) and associated local National Pollutant Discharge Elimination System (NPDES) regulations to ensure that the potential for soil erosion is minimized on a project-by-project basis. However, as the proposed project is disturbing less than one acre—both the Cedar Suites and Staff Housing project disturb 0.74 acres combined—CGP does not apply, and a Stormwater Pollution Prevention Plan (SWPPP) will not be required.

The proposed project will include an erosion and sediment control plan (ESCP) as part of the grading plan set which will serve to protect water quality downstream of the project site during construction. Some sediment control BMPs such as silt fences and gravel bags will likely be implemented to prevent project site sediment runoff into the local Willow Creek watershed. Additionally, proper waste management and vehicle tracking mitigation measures will also likely be implemented to prevent pollutants from entering Willow Creek.

VIII. IMPACT ASSESSMENT

Overall, both the Cedar Suites and Willow Creek Staff Housing projects will have minimal impact compared to existing conditions. From a site drainage assessment standpoint, the post condition imperviousness is less than the existing project impervious area, so the existing offsite catch basin and culvert infrastructure capacity will not be impacted. Regarding water and sewer infrastructure, water demand and sewer flows are greater than existing conditions—however the increase is not expected to impact the existing water or sewer infrastructure. Lastly, since the project will disturb more than 5,000 square feet of impervious surfaces, the project will trigger the development of a WQMP per local Phase 2 MS4 Permit requirements. Given the constraints of the site including shallow bedrock and limited demands for re-purposed storm water, biofiltration, alternative post-construction measures, or a combination of both will likely be the ultimate BMP strategy for the project. The project's final design will dictate BMP sizing and site placement strategies as part of a project-specific WQMP. Last, regarding since both the Cedar Suites project and Staff Housing project each disturb less than one acre of land—0.74 acres combined—the Construction General Permit (CGP) does not apply and a SWPPP will not be required.

IX. APPENDICES

- A. Vicinity Map
- B. Existing Aerial Topographic Survey & Parcel Boundary
- C. Schematic Site Plan
- D. Watershed Map
- E. Site Hydrology Map & Schematic Storm Drain Layout
- F. Schematic Utility Map

APPENDIX A

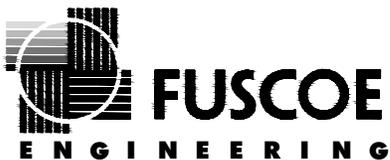
VICINITY MAP



APPENDIX A: VICINITY MAP
11/24/2021



SCALE: 1" = 800'



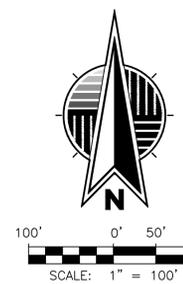
600 Wilshire Blvd., Suite 1470, Los Angeles, California 90017
 tel 213.988.8802 • fax 213.988.8803 • www.fuscoe.com

APPENDIX B

EXISTING AERIAL TOPOGRAPHIC SURVEY AND PARCEL BOUNDARIES

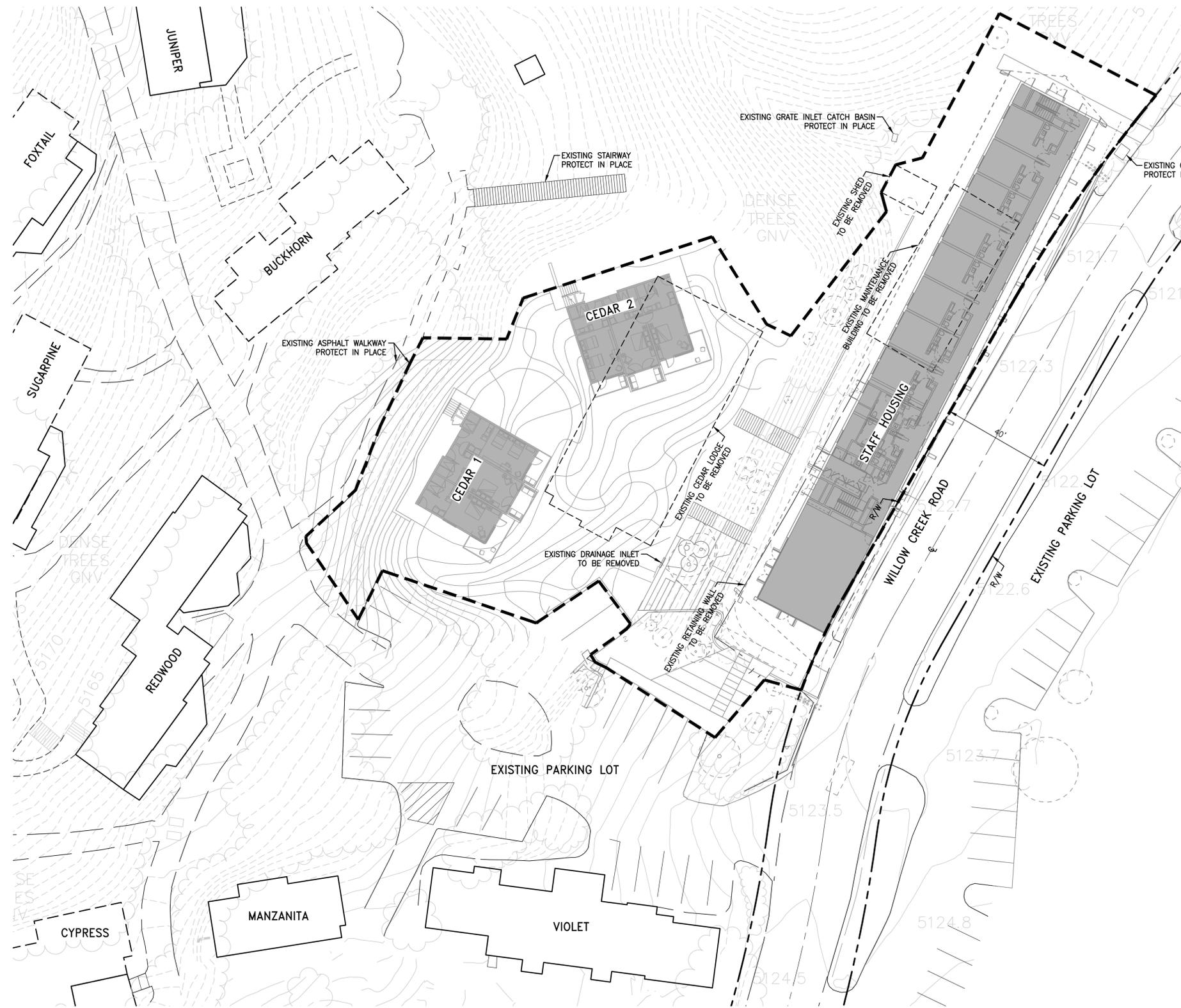


APPENDIX B: EXISTING AERIAL TOPOGRAPHIC SURVEY AND PARCEL BOUNDARIES
11/24/2021



APPENDIX C

SCHEMATIC SITE PLAN



LEGEND

	RIGHT-OF-WAY LINE
	CENTERLINE
	EASEMENT LINE
	APPROXIMATE DISTURBANCE LIMITS (32,211 SF / 0.74 AC)
	CENTERLINE
	RIGHT-OF-WAY
	PROPOSED BUILDING FOOTPRINT



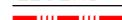
APPENDIX C: SCHEMATIC SITE PLAN
11/24/2021

APPENDIX D

WATERSHED MAP



LEGEND

-  CREEK FLOW LINE
-  FLOW DIRECTION



2000' 0' 1000' 2000'
SCALE: 1" = 2000'

APPENDIX D: WATERSHED MAP
11/24/2021

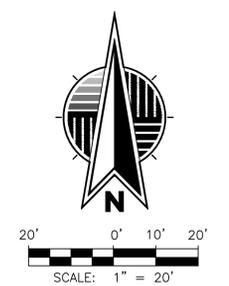
APPENDIX E

SITE HYDROLOGY MAP AND SCHEMATIC STORM DRAIN LAYOUT



LEGEND

	RIGHT-OF-WAY LINE
	CENTERLINE
	EASEMENT LINE
	APPROXIMATE DISTURBANCE LIMITS
	HYDROLOGY SUBAREA AREA LIMITS
	EXISTING STORM DRAIN LINE
	EXISTING SEWER LINE
	EXISTING WATER LINE
	CENTERLINE
	CORRUGATED METAL PIPE
	EXISTING
	RIGHT-OF-WAY
	APPROXIMATE DISTURBANCE AREA (32,211 SF / 0.74 AC)



APPENDIX E: SITE HYDROLOGY MAP AND SCHEMATIC STORM DRAIN LAYOUT
11/24/2021

APPENDIX F

SCHEMATIC UTILITY PLAN

