

Chapter 3	Family Student Housing Redevelopment Project	3-1
3.1	Introduction.....	3-1
3.2	Project Summary.....	3-1
3.2.1	Summary Project Description.....	3-1
3.2.2	Alternatives to the Proposed Project.....	3-7
3.3	Project Goals and Objectives.....	3-7
3.4	Detailed Project Description.....	3-9
3.4.1	Project Location.....	3-9
3.4.2	Existing Facilities on the FSH Site.....	3-9
3.4.3	Summary of Proposed Redevelopment.....	3-10
3.4.4	Population.....	3-12
3.4.5	Project Design Features.....	3-13
3.4.6	Traffic, Access, Circulation and Parking.....	3-14
3.4.7	Public Services.....	3-16
3.4.8	Utilities and Support Services.....	3-17
3.4.9	Construction.....	3-20
3.4.10	Permits and Approvals.....	3-23
3.5	Environmental Setting, Impacts, and Mitigation Measures.....	3-23
3.5.1	Aesthetics.....	3-24
3.5.2	Agricultural Resources.....	3-27
3.5.3	Air Quality.....	3-28
3.5.4	Biological Resources.....	3-35
3.5.5	Cultural Resources.....	3-38
3.5.6	Geology, Soils, and Seismicity.....	3-41
3.5.7	Hazards and Hazardous Materials.....	3-43
3.5.8	Hydrology and Water Quality.....	3-45
3.5.9	Land Use.....	3-50
3.5.10	Noise.....	3-51
3.5.11	Population and Housing.....	3-54
3.5.12	Public Services.....	3-55
3.5.13	Recreation.....	3-56
3.5.14	Traffic, Circulation and Parking.....	3-57
3.5.15	Utilities.....	3-65
3.6	Alternatives to the Proposed Project.....	3-66
3.6.1	Project Objectives.....	3-66
3.6.2	Significant Impacts of the Proposed Project.....	3-67
3.6.3	Alternatives Considered but Rejected as Infeasible.....	3-67
3.6.4	Alternatives Evaluated in Detail.....	3-68
3.6.5	The Environmentally Superior Alternative.....	3-74
3.7	Growth-Inducing Impacts.....	3-75
3.8	References.....	3-75

T A B L E S

Table 3-1	Family Student Housing Redevelopment Project Summary of Impacts and Mitigation Measures
Table 3-2	Population of the Redeveloped Family Student Housing Complex
Table 3-3	Projected Utility Demand
Table 3-4	Summary of Regional Air Emissions from Proposed Project
Table 3-5	Results of Health Risk Assessment of Construction Emissions from FSH Project
Table 3-6	Summary of FSH Impervious and Pervious Areas
Table 3-7	Estimated Runoff Storage Requirements
Table 3-8	Estimated FSH Trip Generation
Table 3-9	2010 Campus Trip Generation Estimate
Table 3-10	2010 Without Project (Baseline) Intersection Levels of Service
Table 3-11	2010 Without Project and With Project (FSH) – Intersection Levels of Service
Table 3-12	Proposed Intersection Improvements

F I G U R E S

Figure 3-1	Family Student Housing Preliminary Site Plan
Figure 3-2	Building Prototypes and Elevations
Figure 3-3	Preliminary Grading and Utility Plan
Figure 3-4	Distribution of On- and Off-Campus University-Related Trips
Figure 3-5	2010 Without Project Intersection Volumes
Figure 3-6	2010 With Project Intersection Volumes
Figure 3-7	North Campus Addition Alternative

Family Student Housing Redevelopment Project

3.1 INTRODUCTION

This section evaluates the environmental effects of the proposed Family Student Housing (FSH) Redevelopment Project, a proposal for the redevelopment of the existing FSH complex located west of Heller Drive on the west side of the campus. The following public comments on the FSH Redevelopment Project were received during EIR scoping:

- A place for families needs to be found for when redevelopment construction occurs.
- If population is going to double, ensure that the impacts of this increase are mitigated.

These comments are taken into account in the design of the proposed project and in the analysis of the proposed project in this EIR.

3.2 PROJECT SUMMARY

3.2.1 Summary Project Description

The proposed project is the redevelopment of the existing FSH complex, which would consist of demolition of the existing 199 family student housing units, and construction of 400 new units. The expanded and improved housing facilities would provide on-campus housing for 400 student families. Residential population of the site would increase from 511 students and family members at present, to about 1,025 persons, including 400 students. The proposed project also includes redevelopment and expansion of existing child care facilities at the site to include an Early Education and Child care Center, consolidated administrative offices for the campus child care program, and community facilities for the FSH community. After redevelopment, the expanded facility would increase child care capacity from the present 78-child capacity to 178 children, with a child care staff of 52 persons.

The Campus proposes to demolish and rebuild the existing complex in two phases, with the first phase starting as early as 2008, and the second phase within the 2005 LRDP planning period, as feasible, based on funding availability, and other constraints and opportunities. The approximately 100 existing housing units in the first phase area, the northern half of the development, would be vacated by attrition, then demolished and redeveloped. The existing child care center, also in the northern half of the development, would also be redeveloped and expanded during this phase, with child care needs accommodated in the interim, in a temporary facility, either on the FSH site or at another location on campus. The second phase of housing demolition and redevelopment would occur after the re-occupancy of the redeveloped first phase area.

Table 3-1, *Summary of Environmental Effects and Mitigation Measures*, presents a summary of the environmental impacts that could potentially result from the approval and implementation of the FSH

**Table 3-1
Family Student Housing Redevelopment Project
Summary of Impacts and Mitigation Measures**

FSH Impact		Level of Significance Prior to Mitigation¹	FSH Mitigation Measures	Level of Significance Following Mitigation¹
3.4.1 Aesthetics				
FSH Impact AES-1	Implementation of the FSH Redevelopment Project would not significantly affect scenic vistas.	LS	Mitigation not required	NA
FSH Impact AES-2	Implementation of the FSH Redevelopment Project would not substantially damage scenic resources on campus, including forested areas and meadows.	LS	Mitigation not required	NA
FSH Impact AES-3	Construction of the proposed project could substantially degrade the existing visual character of the site.	PS	FSH Mitigation AES-3: The Campus will minimize potential degradation of the existing visual character of the site by implementation of LRDP Mitigation AES-5A through 5D.	LS
FSH Impact AES-4	Development under the FSH could create new sources of substantial light or glare at the site that would adversely affect daytime or nighttime views in the area.	PS	FSH Mitigation AES-4: The Campus shall implement LRDP Mitigation AES-6A through AES-6C and AES-6E.	NA
3.4.3 Air Quality				
FSH Impact AIR-1	Construction of the proposed project would generate substantial short-term PM ₁₀ emissions.	PS	FSH Mitigation AIR-1: The Campus shall implement LRDP Mitigation AIR-1.	LS
FSH Impact AIR-2	Operation of the proposed project would increase regional emissions of criteria pollutants.	LS	Mitigation not required	NA
FSH Impact AIR-3	Operation of the project would increase CO concentrations at study area intersections.	LS	Mitigation not required	NA
FSH Impact AIR-4	The population growth associated with the FSH Redevelopment Project is not consistent with the regional Air Quality Management Plan.	S	FSH Mitigation AIR-4: The Campus shall implement LRDP Mitigation AIR-5.	SU

**Table 3-1
Family Student Housing Redevelopment Project
Summary of Impacts and Mitigation Measures**

FSH Impact		Level of Significance Prior to Mitigation¹	FSH Mitigation Measures	Level of Significance Following Mitigation¹
FSH Impact AIR-5	Construction activities for the proposed project could potentially result in a substantial health risk from short-term exposures to toxic air contaminants.	SP	<p>FSH Mitigation AIR-5A: The Campus will minimize construction emissions by implementing LRDP Mitigation AIR-6.</p> <p>FSH Mitigation AIR-5B: For the duration of Phase 1 construction, the Campus shall relocate the childcare center at one of the identified alternative sites, away from the construction zone.</p> <p>FSH Mitigation AIR-5C: Before construction of Phase 2 is commenced, the Campus will evaluate available information with respect to acrolein emission factors to determine whether the potential for significant impact would still exist. If this assessment indicates that there is a potential health risk, the Campus shall ensure that the child care center in the FSH complex is not occupied during the Phase 2 construction period.</p>	NA
3.4.4 Biological Resources				
FSH Impact BIO-1	The project would not result in the loss of western burrowing owl habitat and potential direct and indirect impacts to owls from construction.	LS	Mitigation not required	NA
FSH Impact BIO-2	Construction of the proposed project could result in the loss of nesting and roosting habitat for special-status raptors, and disturbance to active nests or roosts.	PS	FSH Mitigation BIO-2: The Campus shall implement LRDP Mitigation BIO-11.	
FSH Impact BIO-3	Construction of the proposed project could result in temporary degradation of suitable foraging habitat for pallid bat, Pacific Townsend's big-eared bat, western red bat, long-eared myotis, fringed myotis, long-legged myotis, yuma myotis, and greater western mastiff bat.	LS	Mitigation not required	NA

**Table 3-1
Family Student Housing Redevelopment Project
Summary of Impacts and Mitigation Measures**

FSH Impact		Level of Significance Prior to Mitigation¹	FSH Mitigation Measures	Level of Significance Following Mitigation¹
3.4.5 Cultural Resources				
FSH Impact CULT-1	Construction associated with the proposed project could result in the disturbance of previously undiscovered historic or prehistoric cultural resources, deposits, artifacts, or human remains, including buried material potentially associated with CA-SCR-142, which is located nearby.	PS	FSH Mitigation CULT-1: The Campus shall retain a qualified archaeologist to monitor initial site grading in the area of the proposed southern storm water detention basin and any grading within 50 feet of the known margin of CA-SCR-142, to determine whether intact deposits are present. If archaeological materials are exposed by grading, the Campus shall implement LRDP Mitigation CULT-1G and LRDP Mitigation CULT-4B. If human remains are exposed and the County Coroner determines them to be of Native American origin, the Campus shall implement LRDP Mitigation CULT-4C.	LS
FSH Impact CULT-2	The proposed project will result in increased population in the vicinity of Cave Gulch, which could result in increased recreational use of nearby caves that are unique geological resources.	PS	FSH Mitigation CULT-2: The Campus shall implement LRDP Mitigation CULT-6.	LS
3.4.6 Geology				
FSH Impact GEO-1	The proposed FSH Redevelopment Project could result in construction of campus facilities on expansive soils.	PS	FSH Mitigation GEO-1: The Campus shall implement LRDP Mitigation GEO-1.	LS
FSH Impact GEO-2:	The proposed FSH Redevelopment Project could result in construction of facilities in an area underlain by karst features, which could lead to settling or collapse beneath the structures.	PS	FSH Mitigation GEO-2: The Campus shall implement LRDP Mitigation GEO-1.	LS
3.4.7 Hazards and Hazardous Materials				
FSH Impact HAZ-1	Demolition of the FSH could potentially expose construction workers, children at the childcare center, and other occupants to contaminated building materials.	PS	FSH Mitigation HAZ-1: The Campus shall implement LRDP Mitigation HAZ-7 and FSH Mitigation AIR-5B.	LS
LRDP Impact HAZ-2	Redevelopment of the FSH complex would not result in increased risk from wildland fires.	LS	FSH Mitigation HAZ-2: The Campus shall implement LRDP Mitigation HAZ-10A, 10B and 10D.	LS

**Table 3-1
Family Student Housing Redevelopment Project
Summary of Impacts and Mitigation Measures**

FSH Impact		Level of Significance Prior to Mitigation¹	FSH Mitigation Measures	Level of Significance Following Mitigation¹
3.4.8 Hydrology and Water Quality				
FSH Impact HYD-1	FSH construction activities would not contribute substantial loads of sediment or other pollutants in storm water runoff that could degrade receiving water quality.	LS	FSH Mitigation HYD-1: The Campus shall implement LRDP Mitigation HYD-2B.	NA
FSH Impact HYD-2	Redevelopment of the FSH complex could create or contribute runoff that would exceed the capacity of an existing or planned drainage system, cause erosion, or provide substantial additional sources of polluted runoff.	PS	FSH Mitigation HYD-2A: The Campus shall implement LRDP Mitigations HYD-3C and HYD-3D. FSH Mitigation HYD-2B: The Campus shall develop a storm water management system for the proposed FSH Redevelopment Project during detailed project design and shall document that the selected storm water management system adequately retains, detains, and infiltrates runoff such that the peak flows and total volume of water released to Moore Creek do not exceed the design capacity of existing downstream erosion control structures.	LS
FSH Impact HYD-3	Redevelopment of the FSH would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.	LS	Mitigation not required	NA
3.4.9 Land Use and Planning				
FSH Impact LU-1	Implementation of the FSH Redevelopment Project would not result in development that is substantially incompatible with existing or planned adjacent land uses.	LS	Mitigation not required	NA
3.4.10 Noise				
FSH Impact NOIS-1	Construction activities associated with the FSH Redevelopment Project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity.	S	FSH Mitigation NOIS-1: The Campus shall implement LRDP Mitigation NOIS-1.	SU
FSH Impact NOIS-2	The proposed project would not expose residents to a substantial permanent increase in vehicular traffic noise levels.	LS	Mitigation not required	NA

**Table 3-1
Family Student Housing Redevelopment Project
Summary of Impacts and Mitigation Measures**

FSH Impact		Level of Significance Prior to Mitigation¹	FSH Mitigation Measures	Level of Significance Following Mitigation¹
3.4.12 Population Housing				
FSH Impact POP-1	The capacity of family student housing at the project site would be reduced by approximately 50 percent for up to 2 years.	LS	Mitigation not required	NA
3.4.13 Recreation				
FSH Impact REC-1	The proposed project would not result in a significant impact related to temporary and seasonal loss of the use of the informal FSH playing field.	LS	Mitigation not required	NA
3.4.14 Traffic, Circulation, and Parking				
FSH Impact TRA-1	The project under the 2010 conditions would contribute to unacceptable levels of service at two off-campus intersections (Empire Grade / Western Drive and King Street / Storey Street) and would also contribute more than 3 percent of the traffic to those intersections.	S	FSH Mitigation TRA-1A: The University shall contribute its “fair share” (as defined in Section 4.14, Volume II of this EIR) toward the cost of the improvements to the two affected intersections, as identified in Table 3-12, below.	SU
FSH Impact TRA-2	Parking demand for the FSH site would not exceed the available supply.	LS	Mitigation not required	NA
FSH Impact TRA-3	Traffic associated with FSH demolition and construction could result in conflicts with other vehicles, bicyclists, transit, and pedestrians complex and could physically interfere with the campus Emergency Operations Plan.	PS	FSH Mitigation TRA-3: The Campus shall develop a construction traffic management plan to delineate and monitor construction routes and schedule, and monitor construction traffic into and through the FSH complex, in order to prevent conflicts between construction traffic, other vehicles, and pedestrians and bicycles.	LS

¹NA: Not Applicable; NI: No Impact; LS: Less than significant; PS: Potentially Significant; S: Significant; SU: Significant and Unavoidable; SP: speculative

Redevelopment Project. The table is organized to correspond with the environmental issues discussed in Section 3.4, below, and is arranged in four columns: (1) the identified impact under each issue area, (2) significance of impact prior to mitigation, (3) LRDP mitigation measure and/or the project-specific mitigation measure; and (4) the significance of impact after mitigation.

The FSH Redevelopment Project is part of the proposed program for growth under the 2005 LRDP that is analyzed in the 2005 LRDP EIR. Accordingly, the FSH Redevelopment Project would contribute to some of the cumulative impacts associated with the 2005 LRDP and other projected regional growth. All of the cumulative impacts of the 2005 LRDP are analyzed in Volumes I and II of this EIR, and are not addressed again in the impact sections that follow. However, summary discussions of cumulative impacts to which FSH Redevelopment Project would contribute are provided.

3.2.2 Alternatives to the Proposed Project

Alternatives to the proposed project are described, and their environmental impacts are compared, in Section 3.5, below. The following alternatives to the project are analyzed in detail in Section 3.5.3, below.

- **Alternative 1. Reduced Development Alternative:** Under this alternative, the existing FSH complex would be demolished and redeveloped with approximately the same number of units as at present. The footprint of the complex would remain the same as at present, and the residential population would remain at the existing 511 persons. The existing child care facility in the complex would not be redeveloped or expanded, and would continue to serve 78 children. The entire project would be built in a single phase of development.
- **Alternative 2. North Campus Addition Alternative:** Under this alternative, the FSH development would be redeveloped as two housing complexes of 200 units each, one at the existing site, and a second at a new site on the north campus. The project would be built in two phases. In the first phase, a 200-unit FSH development and the proposed EECC would be constructed on an 11.6-acre parcel north of the Crown-Merrill Apartments, which is designated for Colleges and Student Housing (CSH) under the 2005 LRDP. Upon completion, the new complex would be occupied by those vacating the existing complex, and the existing FSH complex would be demolished. Two hundred new units would then be developed on the north half of the existing complex, as described for the first phase of development under the proposed project. The child care facility at the existing site either would be demolished, or a portion of it would be retained for reuse.
- **Alternative 3. No Project Alternative:** Under the No Project Alternative, the new housing and other facilities proposed in the FSH would not be redeveloped, but repairs would continue to be made at the existing development as needed.

The environmental effects of these alternatives, and the extent to which each alternative would meet project objectives, are assessed in Section 3.5, *Alternatives to the Proposed Project*.

3.3 PROJECT GOALS AND OBJECTIVES

The proposed project is the redevelopment of the existing Family Student Housing complex to provide affordable housing for to up to 400 student families.

The existing apartments and child care buildings are 35 years old. The interiors of the apartments need updating, and systems such as roofs, furnaces and some elements of the infrastructure are nearing the end of their useful lives. The apartments do not consistently conform to current campus and state standards with respect to seismic upgrades, ADA-accessibility, and fire safety requirements (Wolff 2005a). Furthermore, the arrangement of the complex does not optimize the use of the site, which could accommodate a larger number of housing units and serve a larger number of children. While it would be possible to repair the existing facilities, the cost of such repairs would be high, would extend the useful life of the complex by only about 10 to 15 years, and would increase the cost of the housing. Further, redevelopment or major renovation would, in any case, be necessary in the long run, and undoubtedly would be more expensive at that future time. Redevelopment of the complex in the near term is therefore proposed.

The current complex is fully occupied and the existing and projected demand for such housing is in excess of the supply on campus. UC Santa Cruz anticipates that the three-quarter average on-campus student population would increase from about 14,050 in 2003-2004 to 21,000 by 2000-2021 under the proposed 2005 LRDP. The 2005 LRDP includes a goal of providing on-campus housing for 50 percent of all undergraduates and for 25 percent of all graduate students. Moreover, additional housing is needed on campus because the availability of rental housing in the City of Santa Cruz and in other nearby communities is low, and potential for new housing development in these off-campus areas is limited under the current City of Santa Cruz General Plan. As a result of the limited housing supply and high demand, housing costs in the city and region have increased significantly in recent years. The low availability and high cost of housing has made it difficult for the campus to attract and retain talented students (many of whom are graduate students) with families. Furthermore, it has become increasingly difficult to develop and maintain the desired close-knit campus learning community, as the lack of affordable housing on campus and nearby has forced students and employees to seek housing at greater distances from campus. Additional housing and a variety of housing will be needed on campus to meet LRDP housing goals. The Campus anticipates increased demand for family student housing under the proposed 2005 LRDP.

In addition to housing, there is a need on campus for affordable child care facilities to serve the child care needs of student families, faculty and staff. The layout of the existing FSH child care facilities does not provide for integration of the child care programs, and the community center used as the principal building was not designed for use as a child care facility is configured inconveniently, and furthermore, is outdated. The administrative staff that manages the campus's child care programs currently are spread out amongst several separate facilities on campus. In order to provide a strong program, the child care program needs campus-wide administrative office, where related functions can be co-located. Locating the Child Care administrative offices near the FSH administrative offices would increase operational efficiency and allow for collaboration between the two offices to provide more integrated family services.

The objectives of the proposed FSH Redevelopment Project are to:

- Develop additional housing units that are as affordable as feasible, in support of the 2005 LRDP student housing goals

- Increase the campus inventory of housing for student families to provide more opportunities for student families to live on campus
- Create an accessible and easily maintained residential community for students and their families
- Provide opportunities for students with families to participate fully in the life of the campus community
- Include appropriate amenities for student families, such as an Early Education and Childcare Center, open space, and bicycle, pedestrian, and transit facilities, to reduce the need for residents to use motor vehicles on campus
- Make the most efficient use of the site in order to minimize the potential use of undeveloped lands elsewhere on campus
- Provide adequate space to accommodate the demand for child care on campus
- Consolidate child care administration facilities in order to strengthen the child care program

3.4 DETAILED PROJECT DESCRIPTION

3.4.1 Project Location

The proposed project site consists of a 25-acre area, of which 21 acres are presently developed as the existing FSH complex. The FSH complex is located near the western edge of the campus south of Porter College, on the west side of Heller Drive, just inside the west entry to the campus. It is bordered on the north by Porter Meadow, on the south by an informal recreation field and grassland, and on the west by a wooded area that descends westward to Empire Grade Road and Campus Natural Reserve (CNR) lands. Heller Drive runs along the east side of the project site and connects with Empire Grade Road a short distance south of the project site at the campus' west entrance. West Koshland Way provides internal access to the central part of the complex from Heller Drive. The project site slopes significantly to the south, toward the intersection of Heller Drive and Empire Grade Road, and also to the west toward Empire Grade Road. From the north (upper) end of the site, there is also a down slope toward Porter Meadow. The project location is illustrated on Figure 3-2 of Section 3.0, *Project Description*, of Volume I of this EIR. [Figure 3-1](#), of this volume, *Family Student Housing Preliminary Site Plan*, presents a conceptual site plan of the project.

3.4.2 Existing Facilities on the FSH Site

The existing Family Student Housing complex consists of 199 two-bedroom, 1,000-sf townhouses, in 42 two- and three-story apartment buildings. This housing serves undergraduate and graduate student couples with or without children, as well as single parent families.¹ One hundred ninety-six of the townhouses are presently occupied by student families, with a total of 511 residents including 196 students, and 315 student family members. Three of the existing apartments are currently being used for

¹ Due to high demand and lack of space, student couples without children are generally placed on a waiting list, with waits of up to 2 years.

housing-support uses, including an administrative office for the complex; a Family Center with counseling service, computer lab, and study center; and an office for the FSH Coordinator for Residential Education (CRE) (Wolff 2005b). The apartment buildings, which are irregular in size and distribution, are clustered around informal landscaped open areas, and are accessed by driveways and parking courts off Koshland Way. The site includes 237 existing parking spaces.

The complex also includes a 24-space child care center located in one permanent building, two modular structures that accommodate 18 infants and 36 toddlers, and an associated fenced play yard constructed in 2004. The child care center primarily serves residents of the complex, although other campus student, faculty and staff families may also use the facility.

3.4.3 Summary of Proposed Redevelopment

The proposed FSH Redevelopment Project consists of the demolition of the existing FSH complex and the construction of a larger Family Student Housing complex that would be more densely developed, to provide about twice the number of housing units as the existing facility. Portions of the existing child care center, and its recently constructed play yard, would be retained, and the child care facility would be expanded. The demolition process and construction phasing are described in Section 3.3.10, *Construction*, below.

The site plan for the proposed project is presently in the conceptual stage, and will be subject to future refinement with respect to the specific number and arrangement of buildings, apartments within buildings, and other site features. The project description provided below outlines the parameters of development as presently envisioned. In overview, the project would include up to 400 family student housing units and associated amenities, an Early Education and Childcare Center (EECC) with capacity for about 178 children, landscaping, open space areas, and parking. Conceptual descriptions of each component of the proposed project are provided below.

3.4.3.1 Proposed Housing Redevelopment

The redeveloped complex would consist of approximately 35 new buildings, which would range from three to five stories above grade in height. These would house about 100 one-bedroom, 200 two-bedroom, and 100 three-bedroom flats and townhouses, and provide 400 student beds. The housing units are anticipated to range between 700-sf and 1,100-sf in size, and provide an average housing density above 20 units per acre (McComb 2005). Each unit would include bedroom(s), bath(s), kitchen, dining and living room areas, and a study area or alcove. Each unit would also be supplied with one parking space, bicycle parking/storage, and a small residential storage box in the garage under each building.

In addition to the flats and townhouses, the complex would include shared facilities for use by all the residents. These would include up to four laundry areas distributed in buildings around the facilities, and a community room in the child care complex that would be available to all residents.

As in the existing complex, the buildings would be arranged in clusters on the site, and would be oriented toward interior streets or public/community open spaces to encourage pedestrian activity and interaction. Buildings would conform to the sloping site to the greatest extent possible. The site would be arranged around three terraces, and individual building pads would be created on these terraces to avoid major

reconfiguration of the natural slope. Terraced retaining walls composed of split faced concrete blocks would be used along the lower edges of the major terraces of the site. They would be designed to minimize the height of retaining wall above adjacent grades, to the greatest extent feasible.

Specific construction and finish materials and architectural details will be developed as design progresses. Consistent with the 2005 LRDP, the project will be subject to the campus design review process. Pursuant to that process, the Campus will evaluate the proposed design of the project to ensure that it is consistent with the planning principles outlined in the 2005 LRDP.

It is anticipated that the housing buildings would be designed in two basic prototypes. The simple “double-corridor” building would extend four to five stories above-grade in height, would include covered parking, and would be located along the forested western edge of the site. In order to reduce the impression of massing of these taller buildings, they would be placed against the backdrop of existing tall and mature trees adjacent to the site (see [Figure 3-2 Building Prototypes and Elevations](#)). Each building would be configured with a central open hallway shared by all occupants. Unit entry doors would open into the corridor from either side of this central hallway. Access to these units would be through a common lobby with an elevator(s) that connects all levels. Parking spaces would be provided in a communal parking podium (garage) at ground level (McComb 2005).

The second building type would consist of two- or three-bedroom attached townhouses and single level apartments, each with direct access to the exterior by way of individual entries or stairs. This prototype would have a stepped profile so that the no face of the building would appear to extend more than three stories above grade (see [Figure 3-2](#)). The units would be clustered to form parking and landscaped entry courts around common central green areas. A parking space for each unit would be “tucked-under” the individual unit (McComb 2005).

While the architectural stylistic reference has not been determined, the designs are expected to include characteristics such as earth-tone colors for walls, light toned or other Energy Star roofing, sun shading at windows, rough textured or rusticated cement plaster or masonry base, and gabled or hipped roofing with deep eaves and low slope (McComb 2005). It is anticipated that the FSH project buildings would be of wood frame construction.

Foundation types would vary depending on the exact site of each building, but are expected to be either conventional spread footings or a mat slab foundation, potentially with drilled piers or micropiles in some areas if needed by the geotechnical requirements of the site. Poured-in-place retaining walls would be installed at building perimeters and road edges that are below grade, as needed. The northwestern portion of the proposed complex would be located in an area that is underlain by marble, and is designated as Karst Hazard Levels 3 and 4 (see Section 4.6, *Geology, Soils, and Seismicity* [Volume I]), based on evidence of doline (sinkhole) formation. Hazards associated with this topography would be addressed by site-specific foundations design, as needed.

3.4.3.2 Proposed Early Education and Childcare Center

The existing FSH complex includes a small child care center, which is housed in two modular buildings and one community center building. The facility also includes a recently-remodeled outdoor play yard.

The existing facility provides child care for a total of 18 infants-toddlers, 36 two to four year olds, and 24 four to six year olds, respectively. In the summer, a school-age program is offered which expands the total capacity of the facility by 60 children.

Under the proposed project, the existing community center building would be demolished. The modular buildings and the play yard would be retained, and a new two-story Family Service Center (FSC) building of about 14,000 gsf would be constructed adjacent to the existing child care facilities. The expanded facility, which would include the two modular buildings and the FSC, would house the EECC, which would serve up to 178 children. The EECC would serve children ranging from infants through school age. The FSC would provide shared-use spaces for family services and the EECC, including a family welcome and resource area, receptionist/registration area, consolidated administrative offices, a teacher preparation room, a teacher lounge, and a kitchen/laundry room. A shared community room would be included on the first floor of this building. An elevator would be included in the design of the FSC for ADA access to the second level. Placement of the building on the slope would provide direct access to the playground from both the first floor community room and from the classrooms on the second floor. A turn-around access road would be provided in front of the FSC, with approximately 20 short-term parking spaces for drop-off/pick-up of children who live off site, and for service and emergency vehicles. Staff of the FSC would be encouraged to park at the West Collector Parking Facility just across the pedestrian over-crossing from the proposed site. It is anticipated that 75 percent of the children served by the EECC would live in the redeveloped complex and 25 percent would live off site. Like the existing child care facility on the site, the EECC would operate during day time working hours, five days a week, year around.

3.4.3.3 Other Site Amenities

Other amenities on the redeveloped site would include a 2,000-asf community room at the FSC, which would be available to both the EECC and the residents of the FSH; administrative offices; and open space with amenities such as picnic tables and shade structures. The informal playing field to the south of the existing FSH complex would be used for construction staging during redevelopment, but would be restored for recreational use at the conclusion of construction.

3.4.4 Population

The existing housing units are occupied by about 196 students and approximately 315 family members, for a total residential population of about 511 persons. Under the proposed project, the residential population that would occupy the FSH complex at completion of all redevelopment is estimated to be up to 400 students and up to approximately 625 dependents, for a total of approximately 1,025 persons. This could include married students or domestic partners, families with children, families without children, and single graduate students.

Currently, the child care facility has about 20 employees and serves about 78 children each weekday, practically all of whom also live in the FSH complex. The EECC would serve a total of 178 children each weekday, including up to 124 children in the new FSC building, and 54 children in the two modular buildings. It is anticipated that 75 percent of the children (about 134 children) served by the EECC facility would reside in the FSH complex while the rest (about 44 children) would live off site. The EECC would

include a staff of approximately 52 FTE employees². After redevelopment, the total non-residential population, thus, would be 52 EECC employees, and about 44 children, who would be on site on weekdays but would not live in the FSH complex.

In summary, as shown in Table 3-2, total residential population of the complex after redevelopment is expected to be about 1,025 persons, an increase of about 514 persons above current numbers. The total non-residential population would increase from 22 persons under current conditions to 97 persons after redevelopment, an increase of about 75 persons.

**Table 3-2
Population of the Redeveloped Family Student Housing Complex**

Facility	Population				
	Students	Dependents	Staff	Children <18	Total
Apartments	400	625 ^a			1,025
EECC ^b			52	178	230

Notes:

(a). Includes children living in the apartments, 75 percent of whom would also be counted as population of the EECC.

(b). This number includes 54 children in the two modulars and the accompanying staff, as well as children and staff in the new EECC building.

3.4.5 Project Design Features

3.4.5.1 Sustainable Design

The Campus encourages use of sustainable designs for all new campus buildings. University of California Office of the President Policy guidelines on Green Building Design and Clean Energy Standards require a minimum standard equivalent to a Leadership in Energy and Environmental Design (LEED) 2.1 certification. LEED certification, a green building rating system which was developed by the U.S. Green Building Design, includes a point system with each “green feature” given a point value. The Campus intends to strive to achieve a standard equivalent to LEED certification for the FSH buildings.

The proposed project includes basic design and development elements that are oriented toward sustainability. These include development on a previously developed site to minimize new site disruption; design of grading and building height to be compatible with the existing topography and backdrop of trees; placement and design of buildings to maximize passive heating and cooling; maximization of pervious surfaces and pervious paving within the development, wherever feasible, to minimize surface water runoff; and use of shielded and cutoff lighting. Design may also incorporate light-toned or Energy Star roofing, and will follow construction practices for outside air ventilation systems as listed in LEED-H (the LEED rating and certification system for homes). The use of photovoltaic systems and/or other sustainable on-site power sources will be analyzed and included in the project if financially feasible (Scott 2005). The project design will also incorporate the use of locally-produced materials and other environmentally preferred materials to the extent possible.

To minimize irrigation demands, the use of turf would be limited, landscaping would include mulching, and irrigation systems with rainwater sensing controls would be installed. The potential for rainwater

² This number may vary and is based on a child/adult ratio.

harvesting and grey water use would also be explored. Conservation efforts would also include the installation of very high efficiency plumbing fixtures, and selection of appliances that meet Energy Star criteria. Additional sustainable features of the proposed project related to landscaping, site access, and utilities are noted in subsequent sections.

3.4.5.2 Lighting

Exterior lighting at the FSH complex would be designed in accordance with the UC Santa Cruz Campus Standards and Design Guidelines. Pole lighting utilizing shielded and cutoff type fixtures with high-intensity discharge lamps would be used for parking and walkways. This could include any of a range of high-efficiency lamps. A photocell and automatic lighting control system would be used to turn lights on and off. Lighting would be designed to minimize glare and off-site light spill.

3.4.5.3 Landscaping

The proposed project would include landscaped greenbelts and landscaped courtyards between building clusters, with a series of pedestrian and ADA-accessible paths linking the residential buildings and the FSC with each other and with the main roadways on the site.

Public areas of the complex would be landscaped in natural appearing drifts of drought-tolerant, native and adapted planting. To blend with the surroundings, meadow and oak plantings would be used along the southern edge of the complex and along Heller Drive. Redwood and forest species would be used to the west and north. Central green areas would have meadow plantings with scattered oak trees, and would include informal play areas. Where hardscape is needed, materials with permeable or semi-permeable surfaces would be used where possible, such as within the residential parking courts. The FSC would include a small plaza with benches shaded by trees for social gatherings for the community.

There are currently about 154 mature trees within the housing complex. About 100 to 105 trees would be removed to build the proposed project. The rest of the mature trees would be retained in place or relocated. In particular, existing healthy, mature trees along the south side of the development would be retained to the extent feasible, to serve as a screen between the campus entrance and the redeveloped complex. The expansion of the development would also require removal of about 3.82 acres of the mixed woodland that covers the western slope of the site (McComb 2005). In this area, to the extent possible, oaks and redwoods would be preserved and a dense screen of trees would be maintained between the development and Empire Grade Road wherever possible. Landscaping amenities would be installed and new trees would be planted concurrently with each phase of redevelopment. Trees retained in the final plan would be protected during development with appropriate fencing and other measures.

3.4.6 Traffic, Access, Circulation and Parking

The transportation and circulation concept for the proposed FSH complex accommodates and integrates a range of transportation facilities, including automobile, mass transit, bicycle, and pedestrian facilities. The project site has excellent access to and connections with the existing transit, bicycle and pedestrian networks, and the proposed project includes pedestrian and bicycle paths, and bicycle parking facilities, to encourage the use of these modes of transport.

3.4.6.1 Circulation within and Adjacent to the FSH Complex

A site plan for the proposed project is presented in Figure 3-1. The existing FSH complex is accessed from Heller Drive via West Koshland Way, which extends westward into the development from Heller Drive. Koshland Way is not continuous across Heller Drive: East Koshland Way, under existing conditions, extends eastward from the east side of Heller Drive at point about 200 feet downhill from the West Koshland intersection with Heller Drive, to provide access to the Oakes College parking lot. Within the FSH development, west of Heller Drive, West Koshland Way forks, and a northern branch of the road serves the northern end and north-central part of the development, while the main branch of West Koshland Way serves the central and southern parts of the development. Both branches of the road are flanked by a series of driveway or parking courts, each of which is surrounded by a cluster of apartment buildings. Empire Grade Road runs along the west side of the existing development. In most places, there is a steep, forested slope between the development and Empire Grade Road, but in some places the new development would be as close as 40 feet to Empire Grade Road.

Under the proposed project, the existing roadway for the complex would be reconfigured as a loop connected at each end to Heller Drive. The northern entrance to the complex would be at the existing West Koshland Way roadway entrance into FSH (described as Upper Koshland in the traffic analysis for this project), just north of the pedestrian overcrossing over Heller Drive. The southern end of the loop road would connect with Heller Drive opposite the existing East Koshland Way, the roadway into the Oakes College parking lot. The existing Heller Drive/East Koshland Way intersection thus would be converted from the present T-junction to a four-way intersection. An additional loop road would connect the northern portion of the FSH complex to the West Koshland Way loop. Street sidewalks, curbs, and gutters would be designed to meet campus standards.

In addition to roads, bicycle and ADA-accessible pedestrian paths would be included in the development to connect the project site with Heller Drive. Wherever possible, bicycle paths and pedestrian paths would be separated to ensure the safety of children and other pedestrians.

3.4.6.2 Transit Access

Students living in the FSH complex are encouraged to use transit, bicycles, or walk to campus destinations through establishment of convenient and efficient bus routes and schedules and adequate direct bicycle and pedestrian paths. The existing FSH site is served both by Campus Transit operated by TAPS, and by METRO buses operated by SCMTD, which connect the campus with the City of Santa Cruz and outlying communities. In addition to regular day and evening service, FSH is included in the Night Owl Dial-a-Ride service area, which provides late night bus service between the City and campus on weekend nights. There are currently three transit stops on Heller Drive adjacent to the site. There is a stop on the west side of Heller Drive adjacent to the path that leads directly south to Heller from the existing complex, and another at the intersection of Heller Drive and West Koshland Way, the vehicle entrance to the existing complex. A third stop is located on the east side of Heller Drive, at the pedestrian path that connects to the Oakes College parking lot.

3.4.6.3 Parking

The existing FSH complex includes about 235 automobile parking spaces. These include one designated resident space per unit, as well as metered, ADA-accessible, reserved, and campus permit spaces. There are also 20 motorcycle spaces in the complex.

Under the proposed project, parking would be provided at approximately the same ratios as at present, relative to the increased population. Automobile parking for the proposed FSH would be provided in the housing complex at a rate of about one space per unit, or up to 400 spaces. Residential parking would be in ground level or sub-grade parking underneath the flats/townhouse buildings (“podium” or “tucked under” parking) or carports. One hundred-two on-street parking spaces for EECC uses, critical access uses, service vehicles, and visitors, would be provided in either parallel or perpendicular configuration along the loop roads. Residential parking in the complex would be by FSH permit only. FSC and EECC staff would be encouraged to continue to park in the West Collector Parking Facility. Upper Division and graduate student FSH residents would also be eligible to purchase parking permits for a second vehicle, if necessary, in the remote parking lots. These lots are accessible to the complex via Campus Transit.

Parking within the FSH complex is currently managed through the housing office, not TAPS, and it is anticipated that it would continue to be run this way. Parking at the site would require a separate residential parking fee, and residents would be encouraged not to bring cars to campus. FSH parking permits are valid only within the housing complex. Residents of the FSH would be encouraged to use transit, bicycles, or walk between destinations on campus (Scott 2005). All other visitor parking would require the purchase of a guest parking pass at TAPS for use in one of the eligible parking areas outside of FSH. A few “A” permit spaces would be provided for those required to do business in the area.

3.4.6.4 Bicycle Facilities

The FSH Project would provide adequate bicycle parking spots as well as storage areas to encourage the use of bicycles as alternatives to motor vehicles. Secure bicycle storage for each unit would be provided in parking areas. In addition, bicycle racks would be placed near the FSC and in various locations throughout the FSH complex. Bicycles paths would also be included in the circulation plan for the development. As noted above, these would be separated from pedestrian paths to the extent feasible, for the protection of children and other pedestrians.

3.4.7 Public Services

Fire protection for the existing complex is provided by the UC Santa Cruz Fire Department from the campus fire station, which is located about 1 mile from the complex. The campus fire department would continue to provide service for the redeveloped complex. Suitable smoke and fire detectors would be installed in all buildings. The installed fire alarm system would tie in to the existing campus fire protection system. All buildings would be equipped with automatic fire sprinklers.

Police services would be provided by the UC Santa Cruz Police Department from the central campus police station, located near the campus Main Entrance.

3.4.8 Utilities and Support Services

The proposed project includes sustainable development initiatives, which would be directed, in part, to the reduction of utility demand. Strategies designed to conserve water and energy, increase the effectiveness of utility use, and reduce disposal and waste, are included in the FSH design, as described in Section 3.4.5.1, above. In general, these strategies fall into four categories: site design and orientation of buildings for optimum use of natural cooling, heating and natural light through solar exposure; installation of energy-efficient Energy Star appliances with reduced energy demands; facility programs to encourage energy and water conservation; and design and use of water-efficient landscaping, irrigation systems and plumbing fixtures. These strategies are described in more detail by utility area.

Table 3-3 shows the projected annual demands for each utility. All new utility lines would be laid to accommodate the new, denser development, and would be connected through tie-ins at points of connection along Heller Drive and Empire Grade Road.

**Table 3-3
Projected Utility Demand**

Utility	Peak Demand	Annual Demand
Domestic water (gpd)	NA	16,257,237 gallons
Sanitary sewer (gpd)	NA	11,823,445 gallons
Electricity	900 kW	139,000 kW
Natural Gas (therms)	6,480,000 BTU	252,000 therms

3.4.8.1 Domestic Water

The demand for water for domestic uses is based on square footage of building space in the FSH, as well as on population and utility use strategies. It is anticipated that domestic water demand at this site would be controlled through efficient use and conservation of water. Water conservation strategies would include the use of highly efficient fixtures and metering, and drought resistant and native plantings.

The FSH at full development would produce an annual demand of about 45,000 gallons per day. The current domestic water line that serves the complex is a 6-inch pipeline, which is fed by the pipeline that also supplies water to Porter College. The point of connection is currently at the northeast corner of the site. The fire water line runs along the southern end of the existing FSH site near Heller Drive. According to the 2000 Campus Water System Master Plan (CWSMP), the FSH area is experiencing a low residual pressure of approximately 8 psi at maximum demand, plus a fire flow of 3,000 gpm, which is the fire flow standard for a 12,000 sf building. At maximum demand, 20 psi, plus a fire flow of 3,000 gpm, is the minimum allowable pressure.

Domestic water would be provided to the proposed project using the same point of connection along Heller Drive. However, the existing 6-inch pipe would need to be replaced with a 12-inch pipe in order to provide the site with adequate domestic water. Fire protection water would be provided to the redeveloped FSH using one of two options:

- Replacing 2,165 feet of 8-inch pipe and 110 feet of 6-inch pipe with a 12-inch pipe, thus increasing the pipe diameter and allowing for residual pressure at maximum day plus fire flow to increase from 8 psi to 28 psi (Kennedy/Jenks 2003);
- Shifting the northwest region of Pressure Zone 2A into Pressure Zone 2B, as well as replacing 110 feet of 6-inch piping and installing a 14-inch gate valve, thus increasing the residual pressure at maximum day plus fire flow from 8 psi to 29 psi (Kennedy/Jenks 2003).

These facilities would provide adequate water and adequate pressure to meet domestic and fire protection water demand.

3.4.8.2 Storm Water

The project site is currently partially developed with buildings, parking lots, streets, and other structures that represent impervious surfaces that inhibit the absorption of water into the ground and divert stormwater as runoff. The existing impervious areas on the project site total approximately 5.6 acres, or approximately 22 percent of the 25-acre site. Runoff from the existing FSH complex generally flows through two storm drains; the first one runs under Heller Drive and discharges directly into Moore Creek and the second one discharges into the College Eight detention basin.

The proposed redevelopment of the FSH would increase the amount of impervious area to approximately 36 percent of the site. Buildings and hardscape would constitute about 9.1 acres of the project site, and softscape would constitute about 15.9 acres (Kier & Wright 2005). Under existing conditions, the estimated volume of site runoff from a 25-year, 24-hour storm is about 8 acre-feet, with an estimated peak discharge of about 52 cubic feet per second (cfs). With the implementation of the FSH Redevelopment Project, the volume of runoff would increase to about 11 acre-feet, with an estimated peak discharge of approximately 59 cfs for the 25-year, 24-hour storm event. These estimates do not take into account design elements included in the proposed project, such as the use of pervious hardscape, that are expected to result reductions in runoff.

The Campus is exploring several methods for handling storm water the runoff from the redeveloped site, and will use one, or more likely, a combination of methods and facilities, to capture runoff from the site.³ The storm water management elements under consideration for inclusion in the project include the following:

- Construct a new detention/retention basin south of the complex near the Empire Grade Road / Heller Drive intersection;
- Construct a new secondary detention/retention basin to the northwest of the FSH complex in a natural low area;
- Use the recreational field south of the complex for detention/retention;

³ Note that the Infrastructure Improvements Project includes one improvement to handle the runoff from the existing FSH complex. This is the construction of two dispersion manifolds along the south side of the FSH complex to disperse and infiltrate some of the site runoff and reduce the runoff volume that discharges directly into Moore Creek or into the College Eight detention basin. Given that the southern portion of the existing complex would be redeveloped at a later point in time, the Campus would install the dispersion manifolds during the first phase of the Infrastructure Improvements Project.

- Clean out and modify the existing College Eight detention basin to serve as a retention basin (this may be carried out as a separate action as part of the Infrastructure Improvements Project); and/or
- Collect and convey runoff via the new storm drain system and disperse it onto the meadow north and south of the complex using dispersion manifolds.

Although there would be a small increase in storm water runoff generated at the project site due to increase in impervious surfaces, Best Management Practices (BMPs) would be incorporated into the project design, such that there would be no increase in surface water runoff leaving the site and entering Moore Creek. Additional BMPs would be considered and evaluated during design, including constructing vegetated swales, disconnecting roof drains, using pervious pavement, etc. The project design would be required to include BMPs that would attenuate peak flows such that post-project peak flows would not be greater than pre-project peak flows; therefore, discharge of storm water runoff from the project site to Moore Creek would be less than or the same as currently exists.

3.4.8.3 Wastewater

Wastewater collection, disposal, and treatment demands are directly related to consumption of domestic water, and could be reduced through the use of conservation strategies, as described above. Designs that encourage resource conservation would be incorporated into the FSH complex to the greatest extent possible, as described above.

There are two major trunk sewers on the UC Santa Cruz campus. Wastewater from the FSH site would be collected and discharged into the trunk sewer located along Heller Drive, which travels to a single sewer at the Cook House, near the main entrance to the campus, which then discharges into the city's sewer system at Bay and High streets. The City of Santa Cruz provides municipal wastewater treatment services for the entire UC Santa Cruz campus, including the FSH complex. The existing average dry weather flow capacity of the plant is 17 million gallons per day. The plant is currently operating at approximately 60 percent of capacity.

3.4.8.4 Telecommunications

Telephone service, including infrastructure is provided by SBC. According to the PacBell/SBC wiring plans on file with the UC Santa Cruz Information Technology Services (ITS) Cable Plant group, the copper backbone cable serving the FSH complex is currently routed from a below-grade vault along Empire Grade Road in a northeasterly direction and eventually terminates at a main backboard in the center of the site near the existing child care center. Service to the modular buildings would be temporarily disrupted when the child care center is demolished during Phase 1 of redevelopment, to be reconnected when the facility is reoccupied.

Each housing unit would be provided with cable and/or internet-ready connections (Thompson 2005). Cable television (CATV) service is provided to the FSH complex by UC Santa Cruz ITS Media Services. Currently the cable infrastructure is served via conduits from both adjacent Porter College and College Eight across from Heller Drive. Although new lines would be added to accommodate the increased number of units, the point of connection would remain the same.

3.4.8.5 Energy

Electricity and natural gas service would be provided to the FSH complex by PG&E. An existing 12 kV underground electrical main extends along Empire Grade Road to a transformer near the western edge of the FSH site. At this point, the electrical load steps down to 240 volts. From this point of connection, electrical power would be routed to each building on the site through a conduit beneath the loop roads (Thompson 2005).

Natural gas service to the redeveloped FSH complex would be provided from a point of connection to an existing PG&E medium-pressure gas main line that runs along Empire Grade Road. From this connection point, a new natural gas line would be installed in a new utility trench, which would connect to the service vault located on the FSH site adjacent to Heller Drive. From the service vault, 1.5-inch gas lines would branch off to each residential unit and to the FSC.

There are currently 46 common-area gas and electric meters in the complex, for the existing child care center, administration offices, laundry facilities, and maintenance facilities. The total annual electrical usage from July 1, 2004 to June 30, 2005 registered from these common-area meters equaled 71,302 kilowatt-hours (Wolff 2005c). Each individual residential unit has its own gas and electric meter, and the residents are billed directly by PG&E.

The proposed residential buildings and the FSC would require electricity for lighting and appliances, and natural gas for heating. The project is expected to result in an annual usage of about 5.2 million kWh of electricity and about 252,000 therms of natural gas for all residential units.

As previously stated, energy-reducing features proposed for the project include the use of Energy Star appliances, the use of energy-efficient fluorescent lighting in the FSC and other indoor community areas, planting trees to shade the units, and if feasible, installing photovoltaic systems. No air conditioning would be provided in the residential units. The energy usage estimates above do not take these energy saving features into account.

3.4.8.6 Solid Waste

One dumpster per building would be located in the building parking areas. Additional space for recycling convenient to each cluster would be located near the dumpster. The facility is anticipated to produce approximately 160 tons of solid waste per year. The Ground Equipment Shop collects refuse and recycling, campus-wide, several times a week.

3.4.9 Construction

3.4.9.1 Phasing of Redevelopment

It is presently anticipated that the FSH Redevelopment Project would consist of two or more phases of demolition and construction, both for funding feasibility and in order to maintain housing availability throughout construction and minimize disruption for residents. It is presently envisioned that housing in the development would gradually be vacated through attrition as students graduate or move out for other reasons. As apartments are vacated, the remaining population of the development would gradually be

consolidated in the southern half of the development. During Phase 1 of construction, housing in the northern part of the development would be demolished and reconstructed. Upon the completion of Phase 1 construction, residents would transfer into the new housing in the northern half of the development, and housing in the southern half of the development would be demolished and reconstructed.

Demolition of the existing child care building and construction of the new EECC would be included in Phase 1. The existing modular child care buildings, which would be retained, would be vacated during Phase 1 construction. Also, the playground would be closed temporarily, although its landscaping would be maintained during construction. In order to ensure continuity of child care service, campus child care services would be provided at a temporary facility either on the FSH site, or elsewhere on campus. If feasible, the child care facility could be relocated to apartments in the Phase 2 construction area. If this option proves infeasible for any reason, child care services would be provided in modular structures that would be temporarily located elsewhere on campus. It is proposed that the vacant lot just north of Barn G parking, near faculty housing at Hagar Court be used for this purpose. Another potential option would be to locate the temporary child care facility in modular buildings that would be placed in the paved areas near the existing granary child care facilities near the campus main entrance. During the construction period, families could use the existing campus loop shuttle for transport between FSH and either of the temporary sites, both of which have adjacent shuttle stops. The temporary child care facility would be required for a period of between two and four years, depending on construction phasing schedule, and other issues related to occupancy of the site during construction.

Phase 1 construction would begin as funding becomes available; it currently is anticipated to begin as early as 2008. The duration of Phase 1 demolition and construction is anticipated to be about 24 months. Phase 2 construction would begin after completion of Phase 1, probably some time after 2010, and would be completed within the 2005 LRDP planning period. The duration of Phase 2 construction has not yet been determined, but it would be require about the same length of time as Phase 1. There could be a period of several years between construction phases. If the construction phases were separated in time, the child care facilities in the Phase 1 area could be reoccupied in the interim, until the beginning of Phase 2 construction.

3.4.9.2 Demolition, Grading and Construction

The phased redevelopment of buildings would require phasing of site demolition, regrading, landscaping, and road rerouting. A conceptual grading plan has been developed for the site ([Figure 3-3, Preliminary Grading and Utility Plan](#)). During each phase of the project, demolition of structures and related paving would be conducted, followed by grading to recontour, first, the north half of the site (during Phase 1) and, later, the south half of the site. Approximately 130 truck trips per day would also be expected for 8 to 10 weeks during the initial demolition period of each phase for off hauling of demolition debris.

As shown in [Figure 3-3](#), grading across the site would consist of cutting and filling three terraces to accommodate individual building pads. Cut will exceed fill on the site, and will require off-haul of spoils during each phase. Site contours of the northernmost portion of the access road, along with the pads for the buildings, would require moderate grading, and the slope of the southern part of the site would require major grading to accommodate the proposed facilities, particularly to allow them to be inset in the slope

to minimize their obtrusiveness in the landscape. Up to 11.5 acres would be graded over a 2-month period during Phase 1. During this phase, it is anticipated that about 8,000 cu yards of spoils would require off-haul. This would require up to 266 truck trips during that period, or an average of 6 to 7 trips per day. In the southern part of the development, due to the steep slope, the entire area will need to be graded during Phase 2, which would result in a about 20,800 cubic yards of spoils that would have to be off-hauled. This would require about 693 truck trips or about 17 to 18 trips per day. Grading for Phase 2 redevelopment would extend over up to 8.4 acres and would be conducted over a 2 -month period.

Other equipment that would be operated on the site during the grading and site preparation portions of each phase of development would include backhoes, scrapers, loaders, forklifts, and possibly a crane. It is anticipated that heavy equipment would be operating daily on the site during at least the initial 12 months of each phase of development, and less intensively thereafter throughout the construction period. Smaller equipment and power tools would be expected to operate throughout construction. Construction would be confined to daytime hours on weekdays with the possible exception of some of the Phase 2 construction in the immediate vicinity of the EECC, which might be carried out on the weekends, when children are not present.

Should the vacant lot adjacent to the Barn G parking lot be used as a temporary site for the child care center during Phase 1 construction, minor grading would be anticipated to level pads for two or three small modular buildings. About half an acre would be required at the site. The site could be accessed by a temporary graveled road either from the northern edge of the Barn G parking lot, or from Faculty Housing.

BMPs, consistent with Campus Standards, would be employed throughout grading and other phases of construction for storm water and air quality protection. It is not envisioned that any areas within the development site would remain undeveloped for any length of time after grading.

3.4.9.3 Construction Roadways, Staging and Traffic Controls

The existing FSH informal recreational field to the south of the complex would serve as a staging area during both phases of construction. It is likely that the construction staging area would remain open and unvegetated throughout both phases of construction. If a lapse of time is anticipated prior the beginning of Phase 2 construction, the recreation field would be restored and revegetated. During construction, the West Playing Field, which is located across the pedestrian overcrossing from FSH, southeast of Oakes College, would be available for recreational uses by residents.

Because the entire development would not be built at one time, it is likely that temporary roadways would be required during the first phase of development, with a final road pattern established only during the second phase of development. It is anticipated that construction traffic would access and egress the staging area via a temporary roadway connected with Heller Drive just south of the intersection of West Koshland Way. This temporary road would be constructed during Phase 1, likely would be maintained until the conclusion of Phase 2 construction, and then would be restored to the original contours and revegetated at the same time as the restoration of the recreational field. The staging area and the portion of the site under construction during each phase would be securely fenced. A flag person or other traffic controls would be required during active periods of construction, when construction vehicles were

entering or exiting Koshland Way or Heller Drive. Within the housing site, temporary pedestrian and bicycle access routes would be established during each phase of development, and secured to prevent pedestrian and bicycle conflicts with construction traffic.

3.4.9.4 Utilities

Minor excavation would be required to relocate all project utility mainlines. The trenching that would be involved in these minor excavation activities would expose approximately 200 feet of trench per day in Phase 1 and Phase 2, with an estimated 30 cubic yards of stockpiled materials at any given time.

Some temporary utility alignments could be required during the first phase of development, with final connections and alignments established at the second phase. To the extent feasible, utility mainline relocation would be carried out during Phase 1, with stubs constructed for Phase 2 development. Storm water facilities sufficient to serve the entire development also would be constructed during Phase 1, which would also ensure appropriate retention of storm water throughout development. As described earlier, final storm water management systems would be designed during the final design of the project. It is likely that design would include the construction of one or two detention basins. The construction of these basins would require clearing and grading within the project site, and installation of pipelines.

3.4.10 Permits and Approvals

The Regents will consider the approval of the FSH Redevelopment Project subsequent to its consideration of the approval of the 2005 LRDP. It is anticipated that this EIR will serve as the project-level environmental document for this project, unless changes in the project, changes in circumstances, or new information warrant additional environmental review. Project design will require review of final design by the Campus Architect to ensure that the design complies with campus design standards.

The Campus would submit a Notice of Intent to the SWRCB and obtain coverage under the General Permit for Discharge of Storm Water Associated with Construction Activity for the proposed project. The Campus would apply to the California Department of Forestry for a Timberland Conversion Permit and prepare a Timber Harvest Plan to include trees that would be removed for the project.

3.5 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

The impact evaluation that follows examines the construction-phase and long-term impacts from the redevelopment of the 25-acre FSH site. This analysis is tiered from the analysis provided in Volume I of the proposed 2005 LRDP program. The evaluation assesses impacts from the construction of the proposed housing and EECC, as well as utility improvements needed to serve the project, and facilities for the management of storm water. Environmental effects from the potential temporary relocation of child care facilities to modular buildings off site are also assessed in this section.

3.5.1 Aesthetics

3.5.1.1 Environmental Setting

Section 4.1, *Aesthetics* (Volume I), describes the existing aesthetics setting for the entire UC Santa Cruz campus, including the FSH Project site. The 25-acre project site is located near the western margin of the central campus, on the east side of Empire Grade Road just inside the west entrance to the campus. Heller Drive, which exits Empire Grade Road a short distance southwest of the site, is the primary access point to the FSH site and the western portion of the central campus. College Eight and Oakes College are to the east of the site. Due west of the site is the West Remote parking lot. To the north of the site are Porter Meadow, Porter College, and Kresge Apartments.

The complex is located on a highly visible site just inside the West Entrance to the campus. There are no high structures that block views of the complex from the south and east, and the elevation also drops in those directions, thus making the site visible from those directions. To the west though, the thickly forested slope completely screens the site from Empire Grade Road. As a result, views of the existing housing complex are available from several locations on and off the campus. From locations on the southern portion of Heller Drive and a portion of Empire Grade Road near the West Entrance, views of the site include grasslands in the foreground, the housing complex in the middle ground and the edge of the forest in the background. Mature trees and landscaping present within the complex and along the edges of the complex soften the appearance of the housing complex as it sits within its somewhat natural setting. As a viewer travels north along Heller Drive near the pedestrian overcrossing, the housing complex features prominently in the foreground, but does not appear to be out of context as other campus development also can be viewed on both sides of Heller Drive and overall the area appears as a developed area. Views from Porter College also include the FSH site, with grazing land in the foreground and the Pacific Ocean in the background.

A temporary child care site, located near the intersection of Hager Drive and Glenn Coolidge Drive, may be used during Phase 1 construction if suitable temporary child care space cannot be identified in the FSH facility. The site is a vacant field adjacent to existing housing and a parking lot. The modular buildings that would be used for the temporary facility would be visible at the edge of the meadow by those entering and exiting the campus, with a backdrop of housing to the east, parking to the south, and open fields to the north.

3.5.1.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.1 (Volume I) for a discussion of applicable Standards of Significance.

Analytical Method. As defined in Section 4.1 (Volume I), the analysis of visual impacts focuses on the nature and magnitude of the change in visual character of the site due to project implementation and the public vantage points from which this change would be visible.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. Analysis at the LRDP level concluded that implementation of the 2005 LRDP would not affect scenic resources within a scenic highway. Therefore, no further project-level analysis of this issue is required.

Project-Specific Impacts and Mitigation Measures

FSH Impact AES-1-: Implementation of the FSH Redevelopment Project would not significantly affect scenic vistas.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

As discussed in Section 4.1 (Volume I), for purposes of evaluation in this EIR, important scenic vistas were identified to include views of the Pacific Ocean as viewed from a number of locations on the central campus including the knoll at Porter College, and views across the campus and its wooded backdrop as viewed from locations along Empire Grade Road between Western Drive and the West Entrance, Glenn Coolidge Drive between Hagar Drive and Cowell College, and Hagar Drive between Glenn Coolidge Drive and the East Remote parking lot. The proposed project would appear prominently in several of these views, although it would be in the distant background from viewing locations along Glenn Coolidge Drive. Because the proposed FSH Redevelopment Project is an element of the 2005 LRDP and because it is located within several of the key scenic vistas, the project was included in the simulations that are presented in Section 4.1 (Volume I) under LRDP Impact AES-1. As Figure 4.1-12 (Volume I) shows, the proposed redevelopment of the FSH site would result in a more densely-developed site, and the increased density of development would be apparent in views of the project site from Empire Grade Road. However, from this perspective, the rooflines would still be below the tree line that forms the visual backdrop for the development. The project site is also visible from the Seymour Discovery Center but, for this perspective is in the distant background (Figure 4.1-15). Therefore, the proposed project would not adversely affect scenic vistas as viewed from the key vantage points. In addition, redevelopment of the FSH would not significantly affect scenic vistas from vantage points on the campus that include views of the Pacific Ocean. One of the key vantage points on campus is from the knoll at Porter College. The current complex does not obscure this scenic vista. The new buildings would be arranged on the site in a manner that is generally similar to the current layout. Furthermore, the building heights of the proposed FSH buildings along the eastern portion of the site would be consistent with those of the buildings currently on the site. Therefore, views of the ocean from the knoll and other locations near Porter College would not be affected by the project. The impact would be less than significant.

The temporary modular child care facility near the campus entrance, at either the Hagar Road site or the Granary site, would not be highly obtrusive in the visual setting, since there are developed facilities of similar scale adjacent, and the facilities would not be intrusive in any significant views. The buildings would be one-story and would be in place for up to four years, depending on the duration of construction. The impact would be temporary and less than significant.

FSH Impact AES-2: Implementation of the FSH Redevelopment Project would not substantially damage scenic resources on campus, including forested areas and meadows.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

Although approximately 3.82 acres of the wooded area which lines the western edge of the FSH site would be removed to accommodate the project, a wooded screen that extends to Empire Grade Road and beyond would remain intact, and would continue to serve as a backdrop for the housing complex, as well as a visual screen between the development and Empire Grade Road. Although some meadows such as the Great Meadow and the East Meadow are considered scenic resources, Porter Meadow is not a scenic resource and development of a portion of that meadow would not constitute a significant impact on a scenic resource.

FSH Impact AES-3: Construction of the proposed project could substantially degrade the existing visual character of the site.

Significance: Potentially significant

FSH Mitigation AES-3: The Campus will minimize potential degradation of the existing visual character of the site by implementation of LRDP Mitigation AES-5A through 5D.

Residual Significance: Less than significant

The proposed project would entail redevelopment of an existing developed housing site, and thus would not substantially alter the general visual character of the site. However, the proposed project would substantially increase the density of development of the site with taller buildings, entail substantial grading, and require the removal of trees within the existing site and along the site margins. The proposed project includes design features and elements that would minimize the visual effects of denser and taller development, by placing the tallest buildings against a screen of tall trees, retaining a tree screen around the margins of the site to the extent feasible, and setting buildings into the slope to diminish the impression of height and to conform the development to the topography. In addition, the implementation of LRDP Mitigations AES-5A through -5D will ensure that the project design is reviewed by the UC Santa Cruz Design Advisory Board for consistency with the valued elements of the visual landscape; that buildings do not extend above the height of adjacent redwoods; that the adjacent screen of trees is maintained to the greatest extent possible; and that trees are replanted on site to replace those that would be removed by development. With the implementation of these measures, the potential impact would be reduced to a less-than-significant level.

FSH Impact AES-4: Development under the FSH could create new sources of substantial light or glare at the site that would adversely affect daytime or nighttime views in the area.

Significance: Potentially significant

FSH Mitigation AES-4: The Campus shall implement LRDP Mitigation AES-6A through AES-6C and AES-6E.

Residual Significance: Less than significant

The redeveloped complex would include 35 new buildings as well as roads and paths. The buildings and paved surfaces could produce glare as the result of reflections from pavement, vehicles and building materials such as reflective glass and polished surfaces. Lighting also would be installed along pathways and roads and in the carports and ground-level parking lots. The amount of glare during the daytime depends on the intensity and direction of sunlight. At night, artificial lighting can cause glare.

Because the site is currently developed and is surrounded by other development such as College Eight and Oakes College to the east, Porter and Kresge Colleges to the north, the additional lighting from the proposed project would be minimal relative to the existing lighting in the vicinity. Furthermore, most of the dense wooded area that lies along the site's western edge along Empire Grade Road would not be removed, and the site would continue to be screened from that roadway, and therefore the project would not create glare for drivers along that roadway.

In addition, as discussed in Section 3.4.5.2, *Lighting*, above, the proposed project includes design elements to minimize and manage daytime glare and nighttime light. With the inclusion of these measures, the impact would be less than significant. The FSH Redevelopment Project would nonetheless implement LRDP Mitigation AES-6A through AES-6C and AES-6E, which requires that prior to design approval of the proposed project, including the exterior lighting, the Design Advisory Board shall assess the design proposal for potential impacts caused by glare and lighting. All outdoor lighting would be focused, shielded, and directed to specific locations to avoid the production of glare, and minimize atmospheric light pollution, especially towards Empire Grade Road and Heller Drive.

Cumulative Impacts

The cumulative impacts on visual resources and scenic vistas that would result from campus growth under the 2005 LRDP, including the proposed project, are adequately addressed in LRDP Impacts AES-7 through AES-9. No further evaluation of cumulative impacts is necessary.

3.5.2 Agricultural Resources

3.5.2.1 Environmental Setting

Section 4.2, *Agricultural Resources* (Volume I), presents the agricultural resource setting for the entire campus, including the FSH site. Most of the project site is currently developed and about 8 acres are grassland. The FSH site and the vacant lot that would be used temporarily for the child care center are

designated Urban and Built Up as well as Grazing Land on the Farmland Mapping and Monitoring Program (Figure 4.2-1, Volume I).

3.5.2.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.2 (Volume I) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.2 (Volume I) for the analytical method relative to agricultural resources.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. Campus development under the 2005 LRDP, including FSH Redevelopment Project, would not directly or indirectly result in the conversion of farmland to non-agricultural uses. The FSH Redevelopment Project site includes a small amount of land classified as timberland by the California Department of Forestry, and the project would require cutting of up to 3.82 acres of trees. The conversion of this timberland to non-timber uses is addressed in Section 4.4 (Volume I). No project-specific analysis of this resource area is required.

Cumulative Impacts

The cumulative impacts of the 2005 LRDP, including the proposed project, along with other regional growth are adequately addressed in LRDP Impact AG-3. No further evaluation of cumulative impacts is necessary.

3.5.3 Air Quality

This section analyzes air quality impacts associated with implementation of the proposed FSH Redevelopment Project. Impacts evaluated include: (1) PM₁₀ emissions from construction activities; (2) emissions of criteria pollutants from space and water heating, consumer product use, natural gas emergency generator testing, and vehicle trips; (3) consistency with the Air Quality Management Plan; and (4) cumulative impacts.

3.5.3.1 Environmental Setting

Section 4.3, *Air Quality* (Volume I), presents the existing air quality for the entire UC Santa Cruz campus, including the FSH site.

3.5.3.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.3 in Volume I for a discussion of applicable Standards of Significance.

Analytical Method. The impacts of the FSH Redevelopment Project were analyzed using methods similar to those described in Section 4.3 in Volume I of this EIR.

Construction associated with the FSH is expected to start in 2008 and be spread out over two phases. Each phase would last about 2 years and include a demolition sub-phase that would last about 8 to 10 weeks. For the FSH, construction activities are expected to consist mostly of demolition, grading activities, and building construction. URBEMIS2002 was used to estimate construction emissions based on expected construction activities. According to MBUAPCD CEQA guidelines, temporary exhaust emissions of VOC and NO_x from typical construction equipment are accounted for in the air quality plans, and quantification of these emissions is not necessary.

For operations, the FSH would generate emissions from space and water heating, consumer products usage, emergency generator testing, and new vehicle trips. The same approach described in Section 4.3 was used to estimate emissions from these sources. However, emissions from vehicles were calculated for the calendar year 2005 even though the occupation of the first phase is not expected to be completed until after 2010. This assumption would generate conservatively high emissions since the fleet mix would consist of vehicles with higher emissions in 2005 compared to 2010.

The methodology for analyzing local CO impacts is discussed in Section 4.3 in Volume I.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. Analysis in the 2005 LRDP Initial Study concluded that development under the 2005 LRDP, including construction of the FSH Redevelopment Project would not generate objectionable odors affecting a substantial number of people. The FSH Redevelopment Project would not contain sources of concentrated odors. Since no odor impact would occur, no additional analysis is required. Also, the redeveloped complex would not be a significant source of toxic emissions and, therefore, exposure of receptors to toxic air contaminants as a result of project operations is not a concern for this project.

Project-Specific Impacts and Mitigation Measures

FSH Impact AIR-1: Construction of the proposed project would generate substantial short-term PM₁₀ emissions.

Significance: Potentially significant

FSH Mitigation AIR-1: The Campus shall implement LRDP Mitigation AIR-1.

Residual Significance: Less than significant

Construction of the proposed project would consist of demolition, grading, and building construction, in two phases. Each of the two construction phases would require demolition of about 100 existing units distributed among 17 to 20 buildings. Demolition would create fugitive dust emissions, and PM₁₀ emissions would result from equipment exhaust. Based on the 100-unit building area to be demolished over an 8- to 10-week period, PM₁₀ emissions are expected to be 24 pounds per day, which is less than the 82 pounds per day significance threshold.

After demolition, project grading is expected to involve about 11.5 acres in Phase 1 and about 8.4 acres in Phase 2. Using the URBEMIS2002 assumption that 25 percent of the total area would be graded in one day, approximately 2.9 acres are anticipated to be graded on the reasonable worst-case day during Phase 1, and about 2.1 acres on the reasonable worst case day in Phase 2. While portions of the Phase 1 site are

generally level and will require minimal grading, some portions would require cut and fill, which would require major grading. According to the MBUACPD CEQA Guidelines, fugitive dust emissions during major grading activities are expected to be less than significant if the maximum area graded per day is less than 2.15 acres. Because the proposed project could disturb about 2.9 acres per day, and because major grading would be underway on certain days, the resulting PM₁₀ emissions could be about 110 pounds per day, which would be in excess of the significance threshold of 82 pounds per day. Therefore, the impact from short-term PM₁₀ emissions generated during site grading would be significant. The Campus would implement MBUAPCD recommended dust control mitigation measures identified in the LRDP Mitigation AIR-1, which would reduce PM₁₀ emissions from the grading activities by half, and the impact would be reduced to a less-than-significant level.

The emission thresholds that are used by the MBUAPCD to determine whether impacts would be significant are established for the purpose of attaining and maintaining ambient air quality standards in the air basin. The ambient air quality standards were established to protect the health of all age groups, including sensitive populations such as children and the elderly. With mitigation, project-related construction emissions would not exceed the significance threshold established by the Air District, and the project would not cause an exceedance of an air quality standard; therefore, the emissions of criteria pollutants from the construction activities would not adversely affect the children who may be present near the construction site at the relocated child care center during the construction of Phase 1, and in the redeveloped child care facility during the construction of Phase 2. Also see FSH Impact AIR-5 below.

FSH Impact AIR-2: Operation of the proposed project would increase regional emissions of criteria pollutants.

Significance: Less than significant

LRDP Mitigation: None required

Residual Significance: Not applicable

Emissions from operation of the FSH complex would consist of criteria pollutants generated from the burning of natural gas to provide space and water heating; VOC emission from consumer product usage; criteria pollutants from the burning of natural gas in a emergency generator (expected to be rated 250 kW); and criteria pollutant emissions from vehicles. The FSH Redevelopment Project would consist of 400 residential units and is predicted to generate 1,341 new daily trips. The resulting emissions are presented in Table 3-4.

**Table 3-4
Summary of Regional Air Emissions from Proposed Project**

	VOC	NO _x	PM ₁₀	CO	SO _x	Units
Space and Water Heating	0.23	3.02	1.28	0	0.02	lb/day
Consumer Products	19.57	--	--	--	--	lb/day
Generator	0.34	2.41	0.03	1.59	0.00	lb/day
Vehicles	32	48	--	--	--	lb/day
Total	52	53	1	2	0	lb/day
District Threshold	137	137	82	550	150	lb/day

This table demonstrates that the total estimated emissions would be less than the MBUAPCD emission thresholds. Therefore, the proposed project would not have a significant impact on regional air quality from operation of emission of criteria pollutants.

FSH Impact AIR-3: Operation of the project would increase CO concentrations at study area intersections.

Significance: Less than significant

LRDP Mitigation: None required

Residual Significance: Not applicable

As described in Section 3.2, the proposed project would be built in two phases with the first phase completed as early as 2010 and the entire project built thereafter, but within the timeframe of the 2005 LRDP. Carbon monoxide impact analysis of the project-related vehicle trips at study area intersections were based on traffic analysis for 2010, and vehicle trips from the full project were estimated (see Section 3.14, *Transportation*). The LOS, delay, and volume-to-capacity ratios at study area intersections under With Project and Without Project scenarios in 2010 were reviewed to determine if any of the following screening level thresholds would be exceeded as a result of the proposed project.

- Intersections or road segments that operate at LOS D or better that would operate at LOS E or F with the project's traffic;
- Intersections or road segments that operate at LOS E or F where the volume-to-capacity (V/C) ratio would increase 0.05 or more with the project's traffic; or
- Intersections that operate at LOS E or F where delay would increase by 10 seconds or more with the project's traffic.

These thresholds are listed in the MBUAPCD CEQA Guidelines, and indicate when an intersection may exceed CO standards as a result of a project and may require detailed modeling. The following intersections that would be affected by the FSH Redevelopment Project and the proposed 2300 Delaware Project (discussed in Section 4 of this Volume) were found to exceed these screening thresholds:

- Empire Grade/ Western Drive-AM and PM
- Mission Street/ King Street-PM
- Highland Avenue/ High Street-PM

However, delay and total traffic volume associated with the FSH at the first two intersections listed above are less than the delay and total traffic volume associated with the 2300 Delaware Avenue Project. Since the 2300 Delaware Avenue Project was taken into account at the LRDP level for the 2010 scenario and the LRDP level analysis concluded CO impacts were less than significant, the smaller contribution from the FSH Redevelopment Project would also be expected to be less than significant.

The delay at the last intersection listed, Highland Avenue/High Street, is only about 11 seconds greater for the FSH Redevelopment Project than the 2300 Delaware Avenue Project. In addition, the total traffic

volume at the intersection is only about 2 percent higher (or 16 vehicles) for the FSH Redevelopment Project compared to the 2300 Delaware Avenue Project. The maximum predicted CO concentrations at this intersection at the LRDP-level analysis was only 5.1 ppm and 2.8 ppm for the 1-hour and 8-hour average, respectively. The slight increase in delay and traffic volume is not expected to result in CO concentrations that exceed the state CO ambient air quality standard of 20 ppm (1-hour average) and 9.0 ppm (8-hour average). Therefore, the CO impacts from the proposed project are expected to be less than significant.

FSH Impact AIR-4: The population growth associated with the FSH Redevelopment Project is not consistent with the regional Air Quality Management Plan.

Significance: Significant

FSH Mitigation AIR-4: The Campus shall implement LRDP Mitigation AIR-5.

Residual Significance: Significant and unavoidable

The region is currently not in attainment of the state ozone and PM₁₀ standards. To satisfy the California Clean Air Act, an Air Quality Management Plan (AQMP) was developed by MBUAPCD, to show how the region would comply with the state ozone standard. The AQMP was last updated in 2004 (MBUAPCD 2004b). The plan is based on population forecasts made by the Association of Monterey Bay Area Governments (AMBAG). AMBAG was contacted to request a consistency determination to ascertain if the population growth associated with the FSH Redevelopment Project is accounted for in the AQMP. AMBAG determined that the growth has not been accounted for in the plan. Therefore, as with the 2005 LRDP, the FSH Redevelopment Project would not be consistent with the AQMP. Pursuant to LRDP Mitigation AIR-5, the Campus would work closely with MBUAPCD to update the AQMP and ensure emissions from all campus growth under the proposed 2005 LRDP, including FSH Redevelopment Project are accounted for in future air quality plans. Nevertheless, the 2005 LRDP, including the FSH Redevelopment Project would still be inconsistent with the current AQMP, and may hinder attainment of state ozone and PM₁₀ standards in the region. Thus the FSH Redevelopment Project may result in a significant and unavoidable impact.

FSH Impact AIR-5: Construction activities for the proposed project could potentially result in a substantial health risk from short-term exposures to toxic air contaminants.

Significance: Speculative

FSH Mitigation AIR-5A: The Campus will minimize construction emissions by implementing LRDP Mitigation AIR-6.

FSH Mitigation AIR-5B: For the duration of Phase 1 construction, the Campus shall relocate the child care center at one of the identified alternative sites, away from the construction zone.

FSH Mitigation AIR-5C: Before construction of FSH Phase 2 is commenced, the Campus will evaluate available information with respect to acrolein emission factors to determine whether the potential for significant impact would still exist. If this assessment indicates that there is a potential health risk, the Campus shall ensure that the child care center in the FSH complex is not occupied during the Phase 2 construction period.

Residual Significance: NA

The MBUAPCD requested that UC Santa Cruz conduct a HRA to identify potential health risks associated with emissions of toxic air contamination (TAC) from construction activities, therefore human health risks from construction activities associated with the FSH Redevelopment Project have been estimated. As discussed under LRDP Impact AIR-6, there is a high degree of uncertainty regarding the emissions of acrolein from combustion engines, including mobile combustion engines such as those used during construction. There are no emission factors available for acrolein emissions from construction equipment. Therefore to conduct this analysis, the emission factors for acrolein emissions from construction emission sources were derived as a fraction of the total organic compounds from the exhaust. This approach was suggested by the EPA (EPA 2005b) and it is also consistent with the approach recommended by MBUAPCD. This method invariably produced uncertainty in estimations since emission factors for general categories of equipment are always conservative and each piece of equipment has its own emission characterization. The California Air Toxics Emission Factor (CATEF) database on the CARB website casts doubt on the accuracy of the acrolein emission factor derivation method. CARB staff has also stated that the actual analytical method used to estimate acrolein emissions is highly unreliable, that a reliable test method does not currently exist, and that the test method used may over- or underestimate the actual emission factor (CARB 2005b, c). Until such a time as a dependable method is available, acrolein emission factors used in a health risk assessment are subject to significant uncertainty. In addition, while the construction on the proposed project would last up to a maximum of 4 years assuming both phases are completed back to back, the HRA guidelines do not provide for exposure periods of less than nine years. Therefore, in modeling the impacts from FSH construction, an exposure period of 9 years was used for each phase.

Despite these issues, UC Santa Cruz has developed estimates of potential human health effects from the construction of both phases of the FSH Project, assuming that each phase would last 2 years. Table 3-5 presents the modeling results. As the table shows, based on the construction data for the FSH Redevelopment Project, the total estimated cancer risk from construction of either phase of the project is predicted to be below 10 in one million for both the off-campus and on-campus MEI. Similarly, the total estimated chronic non-cancer hazard indices are also projected to be below the value of 1 at the MEI locations. However, the total estimated acute non-cancer hazard indices for the on-campus and off-campus MEI location would exceed the value of 1. The on-campus MEI is located at the child care center within the FSH complex, and the off-campus MEI is located on the campus boundary directly west of the construction site. There are no receptors present, likely to live or be exposed to these emissions at the boundary because the area is a part of the Wilder Ranch State Park.

**Table 3-5
Results of Health Risk Assessment of
Construction Emissions from FSH Project**

Health Risk	On-Campus MEI ^a	Off-Campus MEI ^b	Significance Level
Phase 1			
Cancer Risk	4.76 in one million	1.87 in one million	10 in one million
Chronic Hazard Index	0.0098	0.0038	1.0
Acute Hazard Index	3.54	4.36	1.0
Phase 2			
Cancer Risk	4.76 in one million	1.60 in one million	10 in one million
Chronic Hazard Index	0.0065	0.0032	1.0
Acute Hazard Index	2.99	4.37	1.0

Notes:

(a) For both phases, the maximum on-campus cancer risk, chronic hazard index and acute hazard index were calculated at Receptor #2231.

(b) For Phase 1, the maximum off-campus cancer risk was calculated at Receptor # 238, located on the campus boundary directly west of FSH. The maximum off-campus chronic hazard index was also calculated at Receptor #238. The maximum off-campus acute hazard index was calculated at Receptor #237, also located on the campus boundary directly west of FSH. For Phase 2, the maximum off-campus cancer risk was calculated at Receptor #235, located on the campus boundary directly west of FSH. The maximum off-campus chronic hazard index and the maximum off-campus acute hazard index were also calculated at Receptor #236, also located on the campus boundary directly west of FSH.

The acute hazard index is driven by acrolein emissions from off-road equipment doing building construction. As noted earlier, there is a high level of uncertainty with respect to the emissions of acrolein from construction equipment. Therefore the reliability of this analysis is uncertain. This analysis was included in this EIR at the request of the MBUAPCD, but because of the uncertainty with respect to the results of this analysis, no conclusion as to the significance of the impact can be reached. The Campus will nonetheless implement FSH Mitigation AIR-5A to minimize TAC emissions to the maximum extent feasible. In addition, pursuant to FSH Mitigation AIR-5B, the Campus will relocate the child care center off site for the duration of Phase 1 construction. There is some uncertainty as to when Phase 2 of the project would be constructed. Therefore, before Phase 2 construction is undertaken, the Campus will conduct an evaluation of acrolein emission factors and recalculate the human health risk if improved emission factors are available at that time and determine whether it is necessary to relocate the child care facility at another location off site for the duration of Phase 2 construction.

Cumulative Impacts

The LRDP-level analysis took into account the increased traffic and other activity associated with the growth on campus, including the additional traffic resulting from the FSH Redevelopment Project. The LRDP-level analysis concluded that the impact from increased regional emissions were significant (LRDP Impact AIR-2). While individually, the regional criteria pollutant emissions generated by the proposed project would not exceed the thresholds, the proposed project would contribute to the identified LRDP Impact AIR-2. Implementation of LRDP Mitigation AIR-2A and AIR-2B, which call for design and construction measures to reduce space heating requirements as well as reduction of total vehicle miles traveled by implementation of feasible Transportation Demand Management measures, would reduce project-related emissions. However, the cumulative impact would remain significant and unavoidable. LRDP Impact AIR-3 addressed the potential for LRDP-related traffic in 2020 to result in carbon monoxide impacts at study area intersections. The LRDP-level analysis included traffic associated with

the FSH Redevelopment Project. The LRDP-level analysis concluded that the CO impacts would be less than significant.

Assuming that the proposed FSH Redevelopment Project and the proposed Infrastructure Improvements Project are constructed concurrently, the cumulative impact from concurrent construction would be less than significant. As discussed under FSH Impact AIR-1 above, no more than 2.5 acres of the FSH site would be disturbed on any one day. With respect to the Infrastructure Improvements Project, although that project involves a large number of components and individual improvements, because of the small scale of each improvement and the manner in which the improvements would be phased, there would be no more than 1 acre of land disturbance per day associated with that project. If the two projects were taken together, they would disturb no more than 3.5 acres of land on the reasonable worst-case day. This is substantially below the 8.1-acre threshold of disturbance which can result in substantial emissions of dust under MBUAPCD CEQA guidelines. Therefore the cumulative impact would be less than significant.

3.5.4 Biological Resources

3.5.4.1 Environmental Setting

Section 4.4, *Biological Resources* (Volume I), presents the environmental setting for the UC Santa Cruz campus, including the FSH site with respect to biological resources. The land on which the project would be constructed is the site of the existing FSH development, along with four additional acres for a total of approximately 25 acres. About 48 percent of the project site has been disturbed previously by the current FSH development, including buildings, roads, parking, and landscaping. Approximately 12 acres of the 25-acre project site are currently developed, including about 5.6 acres under impervious surfaces and 6.4 acres under landscaping. The next most abundant land cover found on the project site is annual non-native grassland, which covers approximately 8.3 acres or 33 percent of the FSH project site. The third land cover is mixed evergreen forest that occupies approximately 4 acres or 16 percent of the FSH project site.

The mixed evergreen forest on the project site is located on a steep slope immediately west and north of the existing FSH development. Mixed evergreens line the western edge of the parcel along Empire Grade Road. The forest overstory is dominated by California bay and coast redwoods. The understory is sparsely vegetated with native shrubs such as California blackberry (*Rubus ursinus*), snowberry (*Sumphoricarpus alba*), woodland strawberry (*Fragaria vesca*), hazelnut (*Corylus cornuta*), and poison oak (*Toxicodendron diversilobum*), and native herbs such as western Solomon's seal (*Smilacina racemosa*), and coastal wood fern (*Dryopteris arguta*). The exotic vine, English ivy (*Hedera helix*), is also present. Two depressions, which may be filled sinkholes, are present at the base of the slope in this forest area northwest of the development. There are a number of mature and immature introduced and naturalized trees on the site around the existing FSH buildings.

Non-native annual grassland in the project area is dominated by exotic species such as wild oats (*Avena barbata*) and big quaking grass (*Briza maxima*). However, approximately 20 percent of the grassland is dominated by native purple needle grass (*Nassella pulchra*).

The FSH site provides suitable habitat for special-status raptor nesting in the trees and foraging in the adjacent grasslands. The affected grasslands have dense cover with minimal evidence of ground squirrel use and thus have low suitability for burrowing owls. The affected woodland has an open understory with suitable habitat for woodrats. The project site also lies adjacent to the Cave Gulch riparian corridor and may provide marginal dispersal habitat for California red-legged frogs (CRLF). The site provides extensive suitable foraging for mule deer.

The parcel that may be used for the temporary location of modular buildings for the child care center east of Glenn Coolidge Road near its intersection with Hagar Road, is vacant and contains ruderal grasses. The parcel is fenced and small street trees are present along the edges of the parcel. It does not contain suitable habitat for any of the sensitive species noted above, because it is periodically disked for fire control.

3.5.4.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.4 (Volume I) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.4, (Volume I), for analytical methods relative to biological resources. A biological survey of the FSH site and adjacent areas was conducted in June 2005 (Jones and Stokes Associates 2005). The object of the survey was to describe and document the plant communities and habitats and associated wildlife resources that were present on and near the site, and secondarily, to evaluate the potential for special-status species on the project site. Due to the use of the site for housing for almost four decades, no suitable habitat for special-status plants was found and none is likely to be present.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The proposed redevelopment of the FSH would not have a direct substantial adverse effect on any special status plant species, or on CRLF, a special status wildlife species. Moreover, the project site does not include migratory fish habitat or identified wildlife corridors. The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors. No further analysis is required. The Habitat Conservation Plan (HCP) for CRLF and Ohlone Tiger Beetle, previously prepared for the campus, applies to a limited part of the campus, and that area would not be affected by the proposed project. Construction of FSH would have no impact on waters of the U.S. or waters of the State, nor would it cause degradation of riparian vegetation as none exists on the site. Impacts related to the potential degradation of habitat via alterations in hydrology for special-status cave invertebrates including Santa Cruz telemid spider, Dollof Cave spider, Empire Cave pseudoscorpion, or Mackenzie's Cave amphipod, have been adequately analyzed at the LRDP level. No further analysis is required.

Project-Specific Impacts and Mitigation Measures

FSH Impact BIO-1: The project would not result in potential direct and indirect impacts to western burrowing owl owls from construction.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

Western burrowing owls are known to occur on campus within the East Meadow and grasslands in the southwestern corner of the campus (Linthicum 2005). Although the grasslands at FSH site, which are potential owl habitat, would be removed, the species has never been known to occupy that area. Hence, the project does not have the potential to affect western burrowing owls directly or indirectly and the impact is considered less than significant. The vacant parcel near faculty housing at Hagar Court that may be used to temporarily locate the child care facility does not contain burrowing owl habitat because the parcel is periodically disked for fire control. This discourages ground squirrel burrows and the establishment of burrowing owls.

FSH Impact BIO-2: Construction of the proposed project could result in the loss of nesting and roosting habitat for special-status raptors, and disturbance to active nests or roosts.

Significance: Potentially significant

LRDP Mitigation: The Campus shall implement LRDP Mitigation BIO-11.

Residual Significance: Less than significant

Six special-status bird species, sharp-shinned hawk, golden eagle, northern harrier, loggerhead shrike, Cooper's hawk or white-tailed kite, use the campus grasslands as foraging habitat and nest in the trees that are present throughout the campus. As described earlier, woodlands are present to the west and northwest of the existing FSH site. Construction of the proposed project would require the removal of about 3.8 acres of woodlands and about 100 mature trees that are present on the site, which provide nesting and roosting habitat for these species. The removal of this habitat would not constitute a significant impact as ample nesting habitat would still be available in the area. However, construction-related noise at the project site could result in the loss or abandonment of active nests of special-status bird species. This would be a potentially significant impact. Furthermore, the removal of trees when active nests are present in them would also represent a significant impact. LRDP Mitigation Measure BIO-11 would reduce the potential impact of the proposed project on active nests of these six species of special-status raptors or other birds of prey to a less-than-significant level.

FSH Impact BIO-3: Construction of the proposed project could result in a small reduction of suitable foraging habitat for pallid bat, Pacific Townsend's big-eared bat, western red bat, long-eared myotis, fringed myotis, long-legged myotis, yuma myotis, and greater western mastiff bat.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

Eight special-status bat species, pallid bat, Pacific Townsend's big-eared bat, western red bat, long-eared myotis, fringed myotis, long-legged myotis, yuma myotis, and greater western mastiff bat, have been observed foraging throughout the campus. Construction of the proposed project would require the removal of about 3.8 acres of trees that could provide foraging habitat for these bats. Given the large extent of remaining high quality foraging habitat in the campus and in surrounding areas, and the fact that a screen of trees will be maintained around the site, the impact from the removal of about 4 acres of bat foraging habitat is considered less than significant and no mitigation is required.

Cumulative Impacts

LRDP Impact BIO-18 addressed the cumulative impact of the 2005 LRDP, including the FSH Redevelopment Project and other regional growth on special-status species and wildlife. LRDP Impact BIO-19 addressed the potential cumulative impact on the Ohlone tiger beetle from increased population (and thereby increased trail use) in the region. The analyses of these impacts took into account the population increase that would result due to the implementation of the FSH Redevelopment Project. No further evaluation of cumulative impacts is necessary.

3.5.5 Cultural Resources

This section assesses the potential for development of the FSH Redevelopment Project to affect cultural resources, in particular archaeological resources.

3.5.5.1 Environmental Setting

Section 4.5, *Cultural Resources* (Volume I), presents the cultural resource setting for the entire UC Santa Cruz campus, including the FSH site.

3.5.5.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.5 in Volume I for a discussion of applicable Standards of Significance.

Analytical Method. Archaeological resources may be affected by any activity that disturbs the surface or subsurface, including increased vehicular traffic, grading, or excavation. The proposed project would involve extensive grading and excavation over a large area. Consistent with LRDP Mitigation CULT-1A, previous survey coverage of the site was assessed and it was determined that an intensive archaeological survey would be required. Consistent with LRDP Mitigation CULT-1B, recorded searches and intensive pedestrian archaeological surveys of the FSH project site (Pacific Legacy 2005) and of the temporary child care center relocation site (Morgan 2005) were conducted. No archaeological sites or historic features were identified on either site, but there is a known prehistoric archaeological deposit, CA-SCR-142, in close proximity to the southern margin of the FSH site. Because existing offsite utility lines would be used to supply the redeveloped site, the potential for utility installations to result in disturbance of archaeological or historical resources was considered slight and these alignments were not subjected to archaeological survey.

Consistent with LRDP Mitigation CULT-5A, the project location was reviewed for the potential presence of paleontologically sensitive formations. No known paleontologically sensitive formations are present on the site.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. No analysis of potential impacts to historic structures is needed because the existing structures on the project site are less than 50 years old.

Project-Specific Impacts and Mitigation Measures

FSH Impact CULT-1: Construction associated with the proposed project could result in the disturbance of previously undiscovered historic or prehistoric cultural resources, deposits, artifacts, or human remains, including buried material potentially associated with CA-SCR-142, which is located nearby.

Significance: Potentially significant

FSH Mitigation CULT-1: The Campus shall retain a qualified archaeologist to monitor initial site grading in the area of the proposed southern storm water detention basin and any grading within 50 feet of the known margin of CA-SCR-142, to determine whether intact deposits are present. If archaeological materials are exposed by grading, the Campus shall implement LRDP Mitigation CULT-1G and LRDP Mitigation CULT-4B. If human remains are exposed and the County Coroner determines them to be of Native American origin, the Campus shall implement LRDP Mitigation CULT-4C.

Residual Significance: Less than significant

As noted above, consistent with LRDP Mitigation CULT-1A, previous survey coverage of the site was assessed and it was determined that an intensive archaeological survey would be required. Consistent with LRDP Mitigation CULT-1B, recorded searches and intensive pedestrian archaeological surveys of the FSH project site and the child care center temporary site were conducted. The records search did not identify any previously recorded cultural resources on the FSH site or child care center temporary site, and the surface surveys did not identify any cultural materials within the project boundaries. No historic features or other potential historical resources were identified on the project site. However, one prehistoric site, CA-SCR-142, a prehistoric lithic scatter (scatter of stone tools and tool manufacturing debris) was recorded previously, near the housing complex. The exact boundaries of the site in the project vicinity are unclear, because this portion of the site apparently was altered by a road cut, and a portion of the deposit may have been graded away or buried (Pacific Legacy 2005). Although no evidence of human remains has been reported at this site, human remains have been discovered in archaeological contexts elsewhere on campus, and thus there is some potential that this site also could include human remains.

A storm water detention/retention basin for the project could be located in the vicinity of CA-SCR-142. The extensive earthmoving activities associated with the FSH redevelopment could expose undiscovered

buried archaeological resources and human remains, including presently undiscovered portion of previously recorded site CA-SCR-142. Consistent with the recommendation of the qualified archaeologist, the Campus will implement FSH Mitigation CULT-1 and LRDP Mitigations CULT-1B and 1C. Under these measures, an archaeologist would monitor initial grading within 50 feet of the recorded margin of CA-SCR-142 and during excavation of the possible southern storm water basin. In the event of an archaeological discovery, the Campus will ensure that excavation stops and the find is protected, and will consult with the archaeologist and project architect to identify measures that would permit preservation in place. If preservation in place is not feasible, the Campus shall retain an archaeologist to develop and implement a research design and data recovery plan. The Campus will also ensure that a local Native American is provided an opportunity to monitor any additional excavation within the margins of a discovered prehistoric deposit, consistent with LRDP Mitigation CULT-4B. If human remains are uncovered and are determined to be of Native American origin, the Campus will implement the procedures set forth in LRDP Mitigation CULT-4C for protection of the remains, documentation, and respectful treatment in consultation with a Native American Most Likely Descendant. The implementation of the mitigation measures above will reduce the potential impact to a less-than-significant level.

FSH Impact CULT-2: The proposed project will result in increased population in the vicinity of Cave Gulch, which could result in increased recreational use of nearby caves that are unique geological resources.

Significance: Potentially significant

FSH Mitigation CULT-2: The Campus shall implement LRDP Mitigation BIO-8.

Residual Significance: Less than significant

Empire Cave and other caves in the Cave Gulch area are in close proximity to the FSH redevelopment. Increased recreational use of the caves in this vicinity could result in impacts to the scientific value of these caves as the result of activities that could affect the geological features or biome of the caves. The Campus will implement LRDP Mitigation BIO-8 to educate potential visitors to the caves regarding the scientific value of the resource, and to discourage activities that could inadvertently damage the resource. With the implementation of these measures, the impact would be less than significant.

Cumulative Impacts

Cumulative impacts on cultural resources from campus development under the 2005 LRDP, including the FSH Redevelopment Project, are adequately addressed under LRDP Impacts CULT-7 and CULT-9. The cumulative impacts of development on significant cultural resources (historical, unique archaeological, and geological) is considered less than significant because both the Campus and the City have protections in place to avoid and minimize impacts to such resources. The project site does not include any paleontologically sensitive areas, and thus would not contribute to any potential paleontological impact.

3.5.6 Geology, Soils, and Seismicity

3.5.6.1 Environmental Setting

Section 4.6, *Geology, Soils, and Seismicity* (Volume I), presents the environmental setting for geology, soils, and seismicity for the entire UC Santa Cruz campus, including the FSH project site. The potential for landslides is slight due to the presence of hard, stable granitic and metamorphic rocks that underlie much of the campus, as well as the FSH project site. Erosion potential at the FSH site is high. There are no natural watercourses on the project site, and no rock outcrops. The soils in the FSH area are mostly loams. Soils throughout the campus are colluvium and substantially thick, with moderate to high shrink-swell capacity. Most significant for the site from the geotechnical standpoint is that soil in some areas of the site consists of soft compressible clay soils and loose sandy silts. Due to settlement considerations, the upper clays are not considered suitable for support of shallow spread foundations without substantial site preparation, and pile foundations may be the best option for construction. Further geotechnical investigations will be conducted to determine the type of foundation most suitable for the additional acres of land to the northeast that would be developed under this project. Some of the site lies on karst topography.

3.5.6.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.6 (Volume I) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.6 (Volume I) for analytical methods relative to geology, soils, and seismicity.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. Analysis in the 2005 LRDP Initial Study concluded that implementation of the FSH Redevelopment Project would not expose people or structures to potentially substantial adverse effects resulting from rupture of a known earthquake fault. No landslides or conditions likely to result in landslides are present on the project site. Liquefaction and lateral spreading due to seismic shaking have been adequately addressed at the LRDP level. The Campus will perform appropriate geotechnical investigations and will comply with the CBC and the University of California Seismic Safety Policy. Compliance with existing procedures and regulations will ensure that the potential for impacts from liquefaction, lateral spreading, landslides, and other ground failure would be less than significant.

Project-Specific Impacts and Mitigation Measures

FSH Impact GEO-1-: The proposed FSH Redevelopment Project could result in construction of campus facilities on expansive soils.

Significance: Potentially significant

LRDP Mitigation: The Campus shall implement LRDP Mitigation GEO-1.

Residual Significance: Less than significant

A geotechnical investigation was conducted in 1968 prior to the construction of the existing FSH. At that time, 18 borings were drilled to test the soils. Localized expansive soils were found in two locations, Borings 8 and 9. It is possible that additional areas with expansive soils could occur on the site. Construction on expansive soils could result in a significant risk to life and property. As required by the CBC and UC policy, and consistent with LRDP Mitigation GEO-1, the Campus will ensure that further detailed geotechnical investigations would be carried out on additional areas of the FSH project site that would support pavement or foundations, to provide appropriate boring, soil, and fault information, where geotechnical investigations have not previously been completed. A site-specific evaluation during the final engineering design of the area and of the thickness of expansive soils will be performed in order to assess and minimize the risk from construction on expansive soils through appropriate engineering. These mitigations as well as compliance with the CBC will ensure that this impact will be less than significant.

FSH Impact GEO-2: The proposed FSH Redevelopment Project could result in construction of facilities in an area underlain by karst features, which could lead to settling or collapse beneath the structures.

Significance: Potentially significant

FSH Mitigation GEO-2: The Campus shall implement LRDP Mitigation GEO-1.

Residual Significance: Less than significant

Figure 4.6-6, *Geologic Hazards Map* (Volume I), presents the karst hazards zones on the campus. The campus is divided into four hazard level zones based on the character of bedrock and the results of previous geotechnical investigations. The zones are described in Section 4.6.1.4, *Karst Hazard and Subsidence* (Volume I). The existing Family Student Housing complex lies in Karst Hazard Zone 2, which is an area with a low potential for karst-related hazards. However the additional 4 acres to the northwest that would be developed under this project are within Karst Hazard Zones 3 and 4.

Implementation of LRDP Mitigation GEO-1, which requires characterization of project site conditions and implementation of the recommendations of the geotechnical investigation, would ensure that the new buildings are designed with foundations appropriate to this geologic setting and would reduce this impact to a less-than-significant level.

During FSH construction, the child care facility may be temporarily located on a vacant parcel near faculty housing at Hagar Court. That site is within Karst Hazard Level 3 area. However, because the facility would consist only of single-story, temporary modular buildings that are relatively light in weight, and would not include substantial foundations, the potential risk with respect to geologic hazards would be less than significant.

Cumulative Impacts

Cumulative impacts of the 2005 LRDP, including the FSH Redevelopment Project, and other regional growth are adequately addressed in cumulative LRDP Impact GEO-6. No further evaluation of cumulative impacts is necessary.

3.5.7 Hazards and Hazardous Materials

3.5.7.1 Environmental Setting

Section 4.7, *Hazards and Hazardous Materials* (Volume I), presents the hazards and hazardous materials setting for the entire UC Santa Cruz campus, including the FSH site, and includes definitions of appropriate terms, a brief summary of applicable regulations, and a discussion of potential hazardous materials and hazardous waste generated on the campus overall.

The proposed project would consist of demolition of about 200 existing housing units and construction of 400 new residential apartments as well as redevelopment and expansion of a child care center. No chemicals except those found in common household cleaners are currently stored at the site, or would be used there under the proposed project. The buildings that would be demolished were constructed in 1968, and asbestos and lead based paint, which were commonly used at that time, may be present in existing buildings on the site. There are no other known hazardous materials associated with the project site under existing conditions.

3.5.7.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.7 (Volume I) for a discussion of applicable Standards of Significance.

Analytical Method. Analytical methods for assessment of potential hazards and hazardous materials impacts for the campus overall are detailed in Section 4.7 (Volume I). Hazardous substances include both hazardous materials and hazardous waste. For this EIR, a substance is defined as hazardous if it appears on a list of hazardous substances prepared by a federal, state, or local regulatory agency or if it has characteristics defined as hazardous by such an agency. The proposed project does not include the use or storage of hazardous materials.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. While the proposed project is located within ¼ mile of an existing and proposed child care center, hazardous materials are not expected to be stored at the project site. No project-level analysis of impacts related to the handling of hazardous materials near a school or child care center is therefore necessary, although potential exposure to contaminated building materials during construction is addressed. Impacts related to safety hazards associated with private airstrips were determined not to be an issue applicable to the campus in the 2005 LRDP Initial Study. The project site does not include any listed hazardous materials locations. The project does not include contaminated soil and groundwater. As the FSH Redevelopment Project will replace a current facility that is assigned to a designated evacuation point, construction of the facility would not impact the existing Emergency Operations Plan. Construction would not impede emergency operations. Therefore, no further analysis is required.

Project-Specific Impacts and Mitigation Measures

FSH Impact HAZ-1: Demolition of the FSH complex could potentially expose construction workers, children at the child care center, and other occupants to contaminated building materials.

Significance: Potentially significant

FSH Mitigation HAZ-1: The Campus shall implement LRDP Mitigation HAZ-7 and FSH Mitigation AIR-5B.

Residual Significance: Less than significant

The existing FSH complex was built in 1968. Many buildings constructed in that era contain asbestos or lead-based paints, which are hazardous materials that were not regulated until 1978. Therefore, asbestos and lead-based paint are likely to be encountered during demolition of the existing FSH buildings. Because the complex would be redeveloped in two phases, student families could be present in that portion of the complex that is not demolished in the first phase or could be present in the new housing built under Phase 1 when phase 2 demolition occurs.

LRDP Mitigation HAZ-7 discusses the requirements for contractors and workers working in such an environment. In compliance with LRDP Mitigation HAZ-7, the Campus will perform an asbestos and lead-based paint survey of the existing FSH buildings before demolition. If asbestos and lead-based paint survey results are positive, the Campus will use licensed contractors to remove the materials in question prior to demolition, in compliance with federal and state regulations, campus policies, and current EH&S procedures. Removal under these regulated conditions would prevent exposure of workers and campus occupants to these materials, and would reduce the impact to a less-than-significant level. In addition, to protect children at the FSH child care center from potential exposure during demolition, FSH Mitigation AIR-5B would be implemented, and the children would be moved off site during construction to avoid potential exposure. With the implementation of these measures the impact would be reduced to a less-than-significant level.

LRDP Impact HAZ-2: Redevelopment of the FSH complex would not result in increased risk from wildland fires.

Significance: Less than significant

FSH Mitigation HAZ-2: The Campus shall implement LRDP Mitigation HAZ-10A, 10B and 10D.

Residual Significance: Less than significant

The FSH Redevelopment Project would not result in a significant increase in risk of wildland fires, since it would be located on the same site as the existing development, and adjacent to other developed areas. Although UC Santa Cruz is a mosaic of developed land and undeveloped grasslands, forest and chaparral, adequate fire suppression services are available, including the UC Santa Cruz Fire Department on the campus and the City Fire Department and CDF nearby to ensure that people or structures on the project

site would not be exposed to a significant risk of loss, injury or death involving wildland fires. As required by LRDP Mitigation HAZ-10A, the UC Santa Cruz Fire Department will conduct annual inspections of all FSH buildings. LRDP Mitigation HAZ-10B requires that campus develop and implement a fire management plan, which requires a buffer between the forest edge and buildings to allow for fire protection as required by applicable codes, along with establishment and maintenance of fire lanes and fire hydrants. LRDP Mitigation HAZ-10D requires campus compliance with International Uniform Wildland Interface Code (UWIC). Because these design measures and protections are incorporated in the project or would be required by Campus policy, the impact is less than significant.

Cumulative Impacts

The cumulative impacts of hazardous materials use, generation, transportation, and disposal associated with campus growth under the LRDP, including the FSH Redevelopment Project, are adequately addressed in LRDP Impact HAZ-12. No further evaluation of cumulative impacts is necessary.

3.5.8 Hydrology and Water Quality

3.5.8.1 Environmental Setting

Section 4.8, *Hydrology and Water Quality* (Volume II), presents the hydrology and water quality environmental setting for the entire UC Santa Cruz campus, including the FSH project site.

3.5.8.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.8 (Volume II) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.8 (Volume II) for analytical methods relative to hydrology and water quality impacts.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The 2005 LRDP Initial Study found that impacts related to hazards associated with levee or dam failure or inundation by seiche, tsunami, or mudflow would not occur under the 2005 LRDP. The Initial Study also determined that the 2005 LRDP would not place housing within a 100-year floodplain. Project-level evaluation of these issues is therefore not necessary.

Project-Specific Impacts and Mitigation Measures

FSH Impact HYD-1: FSH construction activities would not contribute substantial loads of sediment or other pollutants in storm water runoff that could degrade receiving water quality.

Significance: Less than significant

FSH Mitigation HYD-1: The Campus shall implement LRDP Mitigation HYD-2B.

Residual Significance: Not applicable

Soils at the project site are classified as highly to very highly erodible (see Section 4.6, *Geology, Soils and Seismicity*, Volume I of this EIR). The grading involved in preparing the project site for construction would remove existing impervious surfaces that cover about 5.6 acres of the 21-acre complex, and would decrease vegetative cover. This would increase the potential for soil erosion, and thereby could cause an increase in suspended solids in runoff and local receiving waters. In addition to impacts from erosion, impacts to runoff water quality during construction potentially could result from leaks or spills of fuel or hydraulic fluid used in construction equipment; outdoor storage of construction materials; or spills of paints, solvents, or other potentially hazardous materials commonly used in construction.

Construction activities involving the disturbance of one or more acres are required to apply for coverage under the SWRCB's NPDES General Permit for Storm Water Discharges Associated with Construction Activities, submit a Notice of Intent with the required permit fee, and prepare and implement a project-specific Storm Water Pollution Prevention Plan (SWPPP), as described in Section 4.8, Volume II of this EIR. The SWPPP would include a project-specific plan for preventing impacts to water quality through the use of structural and/or operational BMPs during construction. Once FSH construction was complete, the site would be covered with buildings, asphalt, pervious surfaces, and landscaping, so that sediment production would be negligible. Final grading plans would include all proposed grading, drainage improvements, vegetation and tree removal. Potential significant impacts to water quality due to construction activities would be avoided by implementing a SWPPP developed in accordance with the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction Activities. The impact would be less than significant. To further reduce this less-than-significant impact, the Campus would implement LRDP Mitigation HYD-2B, which requires special erosion control measures for hillside grading during winter months.

FSH Impact HYD-2: Redevelopment of the FSH complex could create or contribute runoff that would exceed the capacity of an existing or planned drainage system, cause erosion, or provide substantial additional sources of polluted runoff.

Significance: Potentially significant

FSH Mitigation HYD-2A: The Campus shall implement LRDP Mitigations HYD-3C and HYD-3D.

FSH Mitigation HYD-2B: The Campus shall develop a storm water management system for the proposed FSH Redevelopment Project during detailed project design and shall document that the selected storm water management system adequately retains, detains, and infiltrates runoff such that the peak flows and total volume of water released to Moore Creek do not exceed the design capacity of existing downstream erosion control structures.

Residual Significance: Less than significant

Implementation of the FSH Redevelopment Project would increase the amount of impervious surfaces on the site through the construction of additional hardscape and roof surfaces, thereby resulting in an

increase in the peak flow rates and flow volumes during storm events. Runoff from developed areas also typically occurs more quickly as a result of flow concentration and smoother paths. As shown in Table 3-6, the project would replace approximately 4.4 acres of pervious area with impervious area. Under existing conditions, the site is approximately 22 percent impervious. With the redevelopment of the complex, the amount of impervious area would increase to approximately 36 percent of the site.

Table 3-6
Summary of FSH Impervious and Pervious Areas

	Existing Conditions			Post-Development Conditions		
	Area ^a (Acres)	Percent of Total Area	Runoff Coefficient ^s	Area ^a (Acres)	Percent of Total Area	Runoff Coefficient ^s
Impervious Area	5.6	22%	98	9	36%	98
Pervious Area	19.4	78%	61	15	64%	61
Total Area	25			25		
Weighted Average			70			74

Notes:

(a) Under existing conditions, impervious area includes the following: asphalt concrete paving (2.1 acres), buildings (2.6 acres) and walkways (0.9 acres) (Kier & Wright 2005).

(b) Runoff coefficient for impervious areas (pavement and buildings) was assumed to be 98 (USDA 1986). For pervious areas, runoff coefficient assumed to be 61 based on open space with grass cover greater than 75% and soil type B (USDA 1986). Soil type based on NRCS Soil Survey of Santa Cruz County, CA.

An estimate of the increase in storm water runoff flows due to redevelopment was performed based on the conceptual site plan for the proposed project. Hydrographs for both pre-development and unmitigated post-development conditions were developed using the U.S. Corps of Engineers HEC-HMS model. Preliminary calculations were performed to estimate runoff storage that would be needed to attenuate the post-development runoff to pre-development conditions. Required runoff storage was estimated using Soil Conservation Service empirical equations (Mays 1999). This method of calculation does not require physical information about the detention facility (i.e., stage-storage relationship, discharge rates, etc). The results are summarized in Table 3-7 for the 10-year, 24-hour, and 25-year, 24-hour, storm events.

Table 3-7
Estimated Runoff Storage Requirements

Storm Event	10-year, 24-hour	25-year, 24-hour
Precipitation Depth ^a (inches)	7.5	8.9
Pre-development^b		
Estimated Peak Flow (cfs)	52	59
Estimated Runoff Volume (acre-feet)	8	11
Unmitigated Post-development^b		
Estimated Peak Flow (cfs)	69	76
Estimated Runoff Volume (acre-feet)	9	12
Estimated Required Storage ^c (acre-feet)	1.5	2.0

Notes:

cfs = cubic feet per second

(a) Precipitation-depth-frequency per NOAA Atlas 2 (NWS 1973)

(b) Peak flow and runoff volumes based on SCS Unit Hydrograph method, SCS Type I precipitation distribution, total drainage area of 25 acres, time of concentration of 15 minutes (per K&W), and runoff coefficients shown in Table 3-7.

(c) Estimated storage based on SCS empirical equations (Mays 1999). The estimated volumes include an additional 30% contingency.

The estimated increase in site runoff with redevelopment would not be large. However, Moore Creek drainage, which is the nearest channel that currently receives detained and undetained runoff from most of the project site, is experiencing severe erosion problems and any additional flows added to the channel would exacerbate the erosion problem (see Section 4.8, Volume II of this EIR). The impact would be potentially significant.

To reduce this impact, the Campus would implement LRDP Mitigations HYD-3C and HYD-3D. To comply with LRDP Mitigation HYD-3C, which requires that the project include design measure to ensure that pre-development stormwater flows are maintained or reduced post-development, the proposed project would implement stormwater control measures to ensure that flows from the site do not exceed the capacity of erosion control structures in Moore Creek. In addition, consistent with LRDP Mitigation HYD-3D, the project would include design features to maximize infiltration, such as detention, retention and infiltration features that would maintain peak flows at or below pre-development levels. The Campus may adopt any or several of the following storm water management option to keep additional peak and total flows out of the Moore Creek drainage:

- Construct a detention and/or retention basin to the south of the FSH, just south of the recreational field. Based on available topographic information, this area could provide as much as 4 acre-feet of storage. The ability to discharge water to the subsurface (which may be a sinkhole), and allow the basin to perform as a retention basin, would need to be evaluated during design.
- Construct a second detention and/or retention basin to the northwest of the FSH at a natural low point (the potential storage has not been calculated). Approximately 4.2 acres of the site drain to this area under existing conditions.
- Use the recreational field just south of the site for detention/retention. Storm water runoff could be directed to this area and allowed to pond temporarily. This area could provide approximately 1.3 acre-feet of storage. According to the Soil Conservation Service's Soil Survey Map of Santa Cruz County, soils in the area are typically deep, well drained loams and sandy loams. During design, investigations would be conducted to evaluate the ability to allow storm water to percolate into the subsurface.
- Continue to use the College Eight detention basin. This basin would need to be modified to accommodate and retain additional flows due to the redevelopment of the FSH complex.
- Convey storm water collected in the storm drain system and direct or disperse the flow via perforated pipes onto vegetated areas to the north and south of the redeveloped complex to allow infiltration.
- LRDP Mitigation HYD-3D requires that the campus use methods of infiltrating storm water runoff on or near the project site. Options that will be considered for the FSH Redevelopment Project include:
 - Avoid concentration of runoff from impervious areas by eliminating curbs/gutters and/or redirecting downspouts onto pervious areas around the buildings.
 - Interconnect pervious and vegetated areas, by incorporating swales and open channels in lieu of closed pipe systems.

- Incorporate infiltration-type BMPs in the project design.⁴
- Construct bioswales to lengthen flow paths, slow down runoff velocities, and allow sediments and other pollutants to settle or be treated by the vegetation and/or subsoil matrix.

A preliminary evaluation of these management options shows that a combination of these options would allow the Campus to control most or all of the new post development runoff (both peak flows and total volume) and not release it to Moore Creek. The Campus anticipates that the stormwater drainage improvements to correct the existing erosion conditions in Moore Creek West Entrance Fork that are included in the Infrastructure Improvements Project will be completed before Phase 1 of the FSH Redevelopment Project is completed. If the project results in increased flow rates and volumes of runoff in Moore Creek such that the design capacity of the Infrastructure Improvements is exceeded, however, substantial erosion in the drainage could occur. In order to ensure that the impact is less than significant, the Campus will implement FSH Mitigation HYD-2B, which requires that the Campus examine the proposed options for storm water management further as the detailed design of FSH is prepared and provide documentation that the selected storm water management system adequately retains, detains, and infiltrates runoff such that the peak flows and total volume of water released to Moore Creek from the project do not exceed the design capacity of downstream erosion control structures.

With implementation of LRDP Mitigations HYD-3C and HYD-3D and FSH Mitigation HYD-2B, the proposed project would not discharge flows into the storm water conveyance system in excess of its capacity, would not cause substantial erosion in Moore Creek, and would not release polluted runoff into local receiving waters and the impact would be reduced to a less-than-significant level.

FSH Impact HYD-3: Redevelopment of the FSH would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

The FSH development area makes up less than 3 percent of the total watershed area for Moore Creek, which has a total of 920 acres. The upper portion of the Moore Creek watershed is composed primarily of open space and the UC Santa Cruz campus. Within the lower portion of the watershed are residential areas, general industrial businesses and parks. As described under FSH Impact HYD-2, the project would incorporate storm water management options that would help to reduce runoff peak flows and volume due to development. As such, peak flows in Moore Creek would not increase, and the impact related to flooding would be less than significant.

⁴ Examples of BMPs that provide infiltration include pervious pavement, permeable pavers, percolation trenches and infiltration basins.

Cumulative Impacts

The cumulative impact on Moore Creek watershed from campus growth under the 2005 LRDP, including the FSH Redevelopment Project, and other city growth is adequately addressed in LRDP Impact HYD-7. Although a portion of the project site lies within the Cave Gulch watershed, post development flows would not be discharged into Cave Gulch and the project would not contribute to any cumulative impacts in that watershed. No further evaluation of cumulative impacts is necessary.

3.5.9 Land Use

3.5.9.1 Environmental Setting

Section 4.9, *Land Use and Planning* (Volume II), describes the land uses and applicable planning regulations for the UC Santa Cruz campus and surrounding areas. Located near the West Entrance to the campus, the Family Student Housing site is presently developed with 199 apartments for students with families. The site is surrounded primarily by undeveloped grasslands to the south, and forest to the west and northwest. College Eight and Oakes College lie to the east on the other side of Heller Drive. Porter College lies to the northeast and Porter Meadow is to the north. The housing serves undergraduate and graduate student couples with and without children, as well as single parents.

3.5.9.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.9, *Land Use*, (Volume II) for a discussion of applicable Standards of Significance.

Analytical Method. The analytical method for assessing land use impacts is detailed in Section 4.9 (Volume II).

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The Initial Study for the proposed 2005 LRDP concluded that the LRDP, including the FSH Redevelopment Project, would not physically divide an established community. In addition, the Initial Study concluded that the FSH Redevelopment Project would not conflict with any HCP, as the development under this project would not involve construction in the vicinity of habitat reserves. Therefore, no project-level analysis of these impacts is necessary.

Project-Specific Impacts and Mitigation Measures

FSH Impact LU-1-: Implementation of the FSH Redevelopment Project would not result in development that is substantially incompatible with existing or planned adjacent land uses.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

The FSH Redevelopment Project would involve demolishing an existing housing complex and replacing it with new, more densely developed student apartments and associated amenities. Most of the new development would be constructed on land that is currently developed with student housing and a child care center. The project would be built within the campus boundaries, and surrounded by complementary campus facilities. Because the proposed project would not introduce a new use at the site, and because the surrounding uses in this portion of the campus are also residential, the project would not result in land use incompatibility and the impact would be less than significant.

Cumulative Impacts

Cumulative impacts of campus growth under the 2005 LRDP, including the proposed project, are adequately addressed in LRDP Impact LU-4. No further evaluation of cumulative impacts is necessary.

3.5.10 Noise

3.5.10.1 Environmental Setting

Family Student Housing is located in the western portion of UC Santa Cruz campus. The site is bound by Empire Grade Road to the west, Heller Drive to the east and south, and Porter College and Kresge East Apartments to the north.

3.5.10.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.10, *Noise* (Volume II), for a discussion of applicable Standards of Significance.

Analytical Method. The analytical method for assessing noise impacts is detailed in Section 4.10 (Volume II).

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The analysis in the 2005 LRDP Initial Study concluded that the campus is not located within an airport land use plan, is not within 2 miles of public airport or public use airport, and is not located within 2 miles of a private airstrip. People living and working within the project area, including the FSH Redevelopment Project site, would not be exposed to excessive aircraft noise levels; therefore, no impact would occur and no additional project-level analysis is needed.

Project-Specific Impacts and Mitigation Measures

FSH Impact NOIS-1: Construction activities associated with the FSH Redevelopment Project would result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity.

Significance: Significant

FSH Mitigation NOIS-1: The Campus shall implement LRDP Mitigation NOIS-1.

Residual Significance: Significant and unavoidable

The proposed project would be constructed in two phases. Phase 1 construction, which would occur over a period of about 24 months, would involve the demolition and redevelopment of the northern half of the existing FSH complex including the child care center. During this time, the southern half of the complex would remain occupied by students and their families, and under one of two options, the child care facility would also remain on site, in an apartment in the southern portion of the complex. Persons living in the southern half of the complex would be the nearest sensitive receptors that would be exposed to construction noise from the northerly development, with some of the apartments less than 50 feet from new construction. Other nearby receptors would be residents of Porter College to the north (about 375 feet away from the northern edge of the Phase 1 construction area) and College Eight to the east (about 400 feet away from the eastern edge of the Phase 1 construction area).

Once the northern portion of the complex is redeveloped, it would be occupied by students and their families, and the southern half of the complex would be vacated, demolished and redeveloped. During this second phase of development, also of 24 months duration, the nearest sensitive receptors would be persons living in the northern portion of the new complex, including children and employees in the child care facility. Some of these receptors would be less than 50 feet from the construction area. Other receptors would be residents of College Eight (about 300 feet from the eastern edge of the Phase 2 construction area).

Construction activities would take place primarily during daytime hours (i.e., conservatively assuming a 10-hour typical workday between the hours of 7:00 AM and 7:00 PM), and would include demolition, grading, pouring of foundations, construction of retaining walls and structures, interior and exterior finishing, and landscaping. Typical noise levels from these construction activities (with the normal number of pieces of equipment operating on the site) would range from 75 to 86 dBA L_{eq} at a distance of 50 feet. Noise levels from construction activities generally decrease at a rate of 6 dB per doubling of distance. Thus, at a distance of 100 feet from the center of construction activities, typical construction noise levels would range from 69 to 80 dBA L_{eq} . During both phases, some of the persons residing within the complex who would be less than 100 feet from the construction area would be exposed to noise levels in excess of the significance threshold of 80 decibels. The other nearby receptors, persons living in Porter College and College Eight, would not be exposed to high noise levels because the intervening distance would adequately attenuate the noise. To mitigate this noise impact, the Campus shall implement LRDP Mitigation NOIS-1, which would entail development of a construction noise mitigation program that consists of noise-control measures that would be implemented to reduce construction noise exposure of sensitive receptors. However, the noise impact would not be reduced to a less-than-significant level.

FSH Impact NOIS-2: The proposed project would not expose residents to a substantial permanent increase in vehicular traffic noise levels.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

The Federal Highway Administration Traffic Noise Model (FHWA TNM) was used to estimate the future community noise levels from traffic associated with existing conditions, the 2010 Without Project condition, and the 2010 With Project conditions. Note that the 2010 Without Project condition includes the increase in traffic on campus due to campus growth through 2010 under the 2005 LRDP.

Based on the traffic noise model output for the peak-noise-hour (that is, noise that would occur in conjunction with the heaviest hour of traffic, during “rush hour”), a CNEL value was calculated. The modeled location is 36 feet east of the first row of the existing Family Student Housing units along Heller Drive. The selected modeling location is assumed to be representative of the redeveloped complex that would be exposed to increased noise from traffic along Heller Drive as a result of campus growth under the 2005 LRDP. The results of this modeling, along with the results from the ambient noise survey measurement at this location, were compared to the noise impact significance criteria. Noise increases were not modeled in relation to traffic on Empire Grade Road, as traffic increases on that road are not expected to be substantial.

The calculated existing CNEL at this location is 57.3 dBA. In 2010, under the Without Project condition, the CNEL is estimated at 57.3 dBA, and in 2010 under the With Project condition, the CNEL is estimated at 58.2 dBA. All levels are less than 65 dBA CNEL which is threshold for multi family residential land use. Furthermore, the increase in noise between existing conditions and With Project 2010 conditions is less than 1 decibel and does not represent a substantial increase in noise. Therefore, the proposed project would not expose residential populations to unacceptable noise levels; nor would it substantially increase noise levels above ambient levels. The impact would be less than significant.

Cumulative Impacts

The cumulative noise impact from traffic that would result from campus growth under the 2005 LRDP, including the proposed project, is adequately addressed in LRDP Impact NOIS-2. No further evaluation of this cumulative impact is necessary.

The proposed FSH Redevelopment Project and the Infrastructure Improvements Project would be under construction at the same time. Some of the infrastructure improvements that are proposed in the vicinity of FSH include water distribution line segments to the north and south of FSH, improvements to a natural gas pressure-reducing station, and two storm water dispersion manifolds, a detention basin, and other small utility or storm drainage improvements to the south of FSH. Although construction at the FSH site would occur almost continuously for about 24 months (per phase), the work on each of the various infrastructure improvements would be generally completed in a few days. As discussed in FSH Impact NOIS-1, other than receptors within the FSH complex, all other receptors would be too distant to be significantly affected by FSH construction noise. As a result of this, and due to the short duration of construction at these other improvement sites, the cumulative noise impact would be less than significant.

3.5.11 Population and Housing

3.5.11.1 Environmental Setting

Section 4.11, *Population and Housing* (Volume II), describes the population and housing conditions of the UC Santa Cruz campus and surrounding area. Currently, there are 199 units in the FSH complex, of which 196 are occupied by student families. In 2003-04, there were 5,842 students living on campus, 196 of whom lived in the FSH complex. Additionally, there were 315 spouses and other dependents who lived in the complex.

3.5.11.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.11, *Population and Housing*, (Volume II) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.11 (Volume II) for analytical methods used in the 2005 LRDP EIR relative to population and housing.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The analysis of population and housing at the LRDP level took into account the entire projected increase in campus population and housing under the 2005 LRDP, including the increased number of persons that would live in the redeveloped and expanded FSH complex (LRDP Impacts POP-1 through POP-3). Therefore, no further analyses of project-related impacts related to population and housing are needed.

Project-Specific Impacts and Mitigation Measures

FSH Impact POP-1: The capacity of family student housing at the project site would be reduced by approximately 50 percent for a period of up to three years.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

The proposed project would be constructed in two phases, as described above. This would require that the northern half of the development, which presently provides about 98 family student housing units, would have to be vacated for two years, while this portion of the site is redeveloped. In preparation for Phase 1 construction, the approximately 98 apartments in the northern half of the development would be vacated by attrition, as students graduate or families move off campus. Occupied rentals would be consolidated in the southern half of the existing development during the initial year prior to demolition of the northern half of the existing development. The northern half of the facility would then be demolished and reconstructed over a period of about 24 months, with a total of 200 units. Upon completion of the Phase 1 development, 200 FSH units would be available for reoccupancy. During Phase 1 construction, available FSH stock would be reduced by about 98 units. While attrition would be used as the mechanism for vacating the apartments, and student families, thus, would not be displaced during Phase 1 construction, the overall stock of family student housing on campus would be diminished for the duration of the

construction period. Because the reduction of the stock of family student housing on campus would be temporary, the impact is considered to be less than significant.

Cumulative Impacts

The cumulative impacts on population and housing are adequately addressed under LRDP Impacts POP-1 and POP-3. No further evaluation of cumulative impacts is necessary.

3.5.12 Public Services

3.5.12.1 Environmental Setting

Section 4.12, *Public Services* (Volume II), describes existing public services that currently serve the campus, including the FSH project site. The proposed project would provide adequate fire safety and other safety features, such as sprinklers, alarms, and lighting. The project would be served by Campus police and fire services. In addition, the proposed project includes child care facilities, and is in easy access of libraries and other public services available on campus.

3.5.12.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.12 (Volume II) for a discussion of applicable Standards of Significance.

Analytical Method. As defined in Section 4.12 (Volume II), the additional demand for public services caused by the campus growth is evaluated by comparing the demand generated and the service ratios, response times and other performance objectives of each service to determine if there would be an unmet need, and whether to serve the additional need created by campus growth, public service facilities would need to be expanded.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The LRDP-level analysis of public services impacts evaluated the effects of all campus population growth and facilities expansion under the 2005 LRDP, including future students and their families who would reside in the proposed FSH complex (LRDP Impacts PUB-1 through PUB-4). Therefore, no additional project-level analysis of these impacts is required.

Project-Specific Impacts and Mitigation Measures

Not applicable.

Cumulative Impacts

The cumulative public services impacts of all growth under the 2005 LRDP are adequately addressed under LRDP Impacts PUB-5 through PUB-7. No further evaluation of cumulative impacts is required.

3.5.13 Recreation

3.5.13.1 Environmental Setting

See Section 4.13, *Recreation* (Volume II), for a discussion of existing campus recreation facilities. At the present time, there is a playing field to the south of the FSH complex and a playground at the EECC.

3.5.13.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.13, *Recreation* (Volume II), for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.13 (Volume II) for analytical method relative to impacts on recreational facilities.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The LRDP-level analysis of impacts related to existing recreational facilities and the need for additional recreational facilities took into account all of the projected population increase under the 2005 LRDP, including the additional residential population associated with the FSH Redevelopment Project (LRDP Impacts REC-1 and REC-2). LRDP Impact REC-3 applies to north campus development and is irrelevant to this project. The FSH Redevelopment Project includes redevelopment of a community facility and informal recreational spaces included within the development, as well as small tot-lots within the development, and it therefore complies with LRDP Mitigation REC-2A, which calls for the development of tot-lots and similar facilities within family housing developments. The existing tot lot/play yard at the child care center will be preserved. Therefore, no additional project-level analysis of these issues is required.

Project-Specific Impacts and Mitigation Measures

FSH Impact REC-1: The proposed project would not result in a significant impact related to temporary and seasonal loss of the use of the informal FSH playing field.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

For a period of 2 to 4 years, the existing informal playing field south of the existing FSH complex would be used as a staging area for the proposed project. In addition, at project completion the playing field may be used to retain and infiltrate some of the site runoff during the winter season. The loss of use of this facility during the construction phase, and possibly during the wet season when the area potentially would be used for storm water management, would not result in a significant loss of a recreational facility because sufficient additional playing fields are available on the campus to accommodate campus population growth under the 2005 LRDP, as analyzed in Volume II of this EIR. The West Playing Field is close to the FSH complex and is easily accessible for the residents of FSH complex. The impact would be less than significant and no mitigation is required.

Cumulative Impacts

The cumulative impact on regional recreational facilities from campus growth under the 2005 LRDP is adequately addressed under LRDP Impacts REC-4 and REC-5. Since the proposed project is on-campus family housing, the associated population would not be expected to contribute to recreational demand for off-campus facilities in surrounding communities, except temporarily during the first phase of construction, if student families who cannot find housing on campus, instead, find housing in the study area communities. The contribution of the proposed project to cumulative recreation impacts, therefore, is less than significant. No further evaluation of cumulative impacts is necessary.

3.5.14 Traffic, Circulation and Parking

3.5.14.1 Environmental Setting

See Section 4.13, *Traffic, Circulation and Parking* (Volume II), for a discussion of existing campus transportation facilities and their relationship to off-campus facilities.

3.5.14.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.14 (Volume II) for a discussion of applicable Standards of Significance.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. The LRDP-level adequately analyzes the impacts of the growth of circulation volumes (numbers of pedestrians, bicycles, transit and other vehicles) and the potential for growth effects to conflict with and reduce the effectiveness of alternative modes of transportation, including transit, bicycle and pedestrian travel. The project would contribute to these effects, however, the 2005 LRDP EIR includes program-level mitigation measures (LRDP Mitigation TRA-4A through TRA-4E) to monitor and increase transit capacity as needed, implement circulation improvements, and reduce pedestrian / bicycle / motor vehicle conflicts. Therefore, no additional project-level analysis of these issues is required.

Analytical Method. In order to accurately assess the traffic effects of development of the proposed project, project-related trips were projected in the context of trips on the same road network at the time of full project development. For purposes of this analysis, full project development was assumed to occur by 2010. The methods used to estimate and evaluate traffic impacts are similar to those used in Section 4.14 (Volume II), except as described below.

Project Trip Generation

Vehicle trips generated by the FSH Redevelopment Project in 2010 were estimated based on several sources of trip generation rates and characteristics. Because of the unique nature of the project's uses, standard (published) trip generation rates alone would not accurately reflect the FSH population's trip-making characteristics. The trip generation estimates were based on existing trip characteristics and published trip rates that were adjusted to reflect the type of use.

The trip rates for the project were estimated by determining the number of existing trips generated by FSH complex and the number of students that occupy it. This rate was applied to the number of students expected to live in the complex after redevelopment in order to estimate the number of trips that would be generated by the proposed project.

Trip generation for the EECC was estimated using the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 7th Edition (ITE 2003) for Day Care Center (ITE 565). FSH families utilizing the EECC would not generate trips on the campus roadway network. Approximately 75 percent of the FSH families are expected to utilize the EECC, which would result in a 75 percent reduction in trips generated using the ITE trip generation rate.

Trip generation estimates for the project are shown in Table 3-8. By 2010, FSH is estimated to generate an additional 75 AM peak hour trips, 143 PM peak hour trips, and 1,341 daily trips due to growth.

Table 3-8
Estimated FSH Trip Generation

Description	Units/Students	AM Peak Trip Generation			PM Peak Trip Generation			Daily Trip Generation
		In	Out	Total	In	Out	Total	
Existing Trips	--	31	20	51	49	70	119	1,190
Derivation of Existing Trip Rates ^a	199 units	0.16	0.10	0.26	0.25	0.35	0.60	5.98
Adjusted Child care Rates (ITE) ^b	Trips per child	0.41	0.36	0.77	0.34	0.39	0.73	4.50
Adjusted Rates ^c	--	0.10	0.09	0.19	0.09	0.10	0.18	1.13
Trip Generation (FSH)	400 units	62	40	102	98	141	239	2,392
Trip Generation (Child care)	124 children	13	11	24	11	12	23	140
Total Trip Generation	--	75	51	126	109	153	262	2,531
Growth in Trips (Project)		44	31	75	60	83	143	1,341

Notes:

(a) – Trip rates are derived by dividing the existing number of trips by the existing number of students living in FSH

(b) – Child care rates based on ITE trip generation equations below:

Child care (ITE Code 565)

AM Peak: $T=0.73(X) + 5.24$ (trips per child) 53% in / 47% out

PM Peak: $LN(T)=0.87LN(X)+0.32$ (trips per child) 47% in / 53% out

Weekday: $T=4.55(X)-5.64$ (trips per child) 50% in / 50% out

(c) – Adjustments: (Child care only for students, student families, faculty and staff)

- 75 percent of children using the facility live at FSH

- 25 percent of child care utilized by non-FSH persons

- 100 percent of non-FSH trips are pass-by (i.e., dropping off or picking up children by staff, faculty or students who would already be on campus)

Project Trip Distribution

The trip distribution pattern for the proposed project was determined using the AMBAG travel demand forecasting model. Project trips were distributed to external gates (roadways at the perimeter of the study area such as Highway 1 and 17, Empire Grade Road north, etc.) and to internal zones within the City of Santa Cruz. [Figure 3-4, Distribution of On- and Off-Campus University-Related Trips](#), illustrates the assumed distribution pattern.

3.5.14.3 2010 Without Project (Baseline) Operational Analysis

The 2010 Without Project scenario, in projecting conditions in future years, accounts for foreseeable future development and roadway conditions. By using 2010 Without Project conditions as the baseline for the traffic analysis, a comparison can be made between the future year without project and future year with project conditions; as a result, foreseeable development and roadway improvements can be fully taken into account.

Intersection Operational Analysis

The 2010 Without Project (Baseline) scenario reflects growth in background traffic in the City of Santa Cruz and the region, as well as traffic generated by the main campus reflecting growth between 2004 and 2010. Anticipated off-campus background traffic growth was determined using AMBAG's travel demand forecasting model. The growth in traffic from the main campus was determined by linearly interpolating the growth in traffic estimated between 2004 and 2020 in the 2005 LRDP. Table 3-9, *2010 Campus Trip Generation Estimates*, shows the estimated growth in trips generated by the campus between 2004 (the baseline year for analysis) and 2010, under the proposed 2005 LRDP. In 2010, campus population growth to 21,847 students, faculty, and staff⁵ is estimated to generate 209 AM peak hour, 272 PM peak hour, and 3,504 daily trips over existing traffic.

Table 3-9
2010 Campus Trip Generation Estimate

	AM Peak Trip Generation			PM Peak Trip Generation			Daily Trip Generation
	In	Out	Total	In	Out	Total	
Actual Trip Counts in 2003-04	1,149	303	1,452	828	1,212	2,040	24,830
Total Trips in 2010	1,306	355	1,661	932	1,380	2,312	28,334
Growth (2003/04 to 2010)	157	52	209	104	168	272	3,504

Source: Year 2010 trip generation estimates were interpolated from the year 2020 LRDP trip generation estimates used in the 2005-2020 LRDP EIR, Kimley-Horn and Associates, Inc.

Intersection level of service calculations were conducted to evaluate intersection operations under 2010 Without Project (Baseline) conditions. [Figure 3-5 2010 Without Project Intersection Volumes](#), shows the intersection turning movement volumes that would occur by 2010 under traffic conditions that would result with adoption of the 2005 LRDP. Table 3-10 summarizes the projected 2010 Without Project (Baseline) intersection level of service for the AM and PM peak hours.

⁵ The total 2010 population is interpolated between existing (2004) students, faculty and staff (18,579) and year 2020 students, faculty, and staff (27,294). Source: URS, UC Santa Cruz.

**Table 3-10
2010 Without Project (Baseline) Intersection Levels of Service**

#	Intersection	Type of Control	Peak Hour	LOS Standard	2010 (No Project)	
					Delay (sec)	LOS
7	SR 1 / Western Drive	Signal	AM PM	D	23.9	C
					25.3	C
8	Empire Grade / Western Drive	TWSC	AM PM	--	54.8	F
					207.7	F
9	Empire Grade / Heller Drive	Signal	AM PM	--	5.2	A
					8.2	A
10	Bay Street-Coolidge Drive / High Street	Signal	AM PM	D	17.4	B
					22.7	C
11	Bay Street / Nobel-Iowa Drive	Signal	AM PM	D	11.5	B
					10.8	B
12	Bay Street / Escalona Drive	Signal	AM PM	--	13.4	B
					7.2	A
13	Bay Street / King Street	Signal	AM PM	D	11.1	B
					58.2	E
14	Mission Street / Bay Street	Signal	AM PM	D	47.6	D
					79.3	E
17	Mission Street / Laurel Street	Signal	AM PM	D	33.1	C
					49.4	D
18	Mission Street / Walnut Avenue	Signal	AM PM	D	31.1	C
					18.6	B
19	Mission Street / King Street-Union Street	Signal	AM PM	D	97.9	F
					71.5	E
20	Mission Street / Chestnut Street	Signal	AM PM	E	48.8	D
					48.2	D
22	High Street / Storey Street	AWSC	AM PM	--	16.5	C
					14.7	B
23	King Street / Storey Street	AWSC	AM PM	--	34.7	D
					54.6	F
24	Mission Street / King Street (West)	TWSC	AM PM	--	19.5	C
					25.8	D
30	Highland Avenue / High Street	AWSC	AM PM	--	48.7	E
					152.4	F
46	Heller / Upper Koshland Way (On-Campus)	Signal	AM PM	--	31.2	D
					28.7	D

TWSC – Two-Way Stop-Controlled

AWSC – All-Way Stop-Controlled

Levels of Service of E and F are shown in bold type.

Under 2010 Without Project (Baseline) conditions, the following locations are projected to operate at unacceptable LOS E or F during at least one of the peak hours:

- Intersection 8: Empire Grade / Western Drive (LOS F during both AM and PM peak hours)
- Intersection 13: Bay Street / King Street (LOS E during PM peak hour)

- Intersection 14: Mission Street / Bay Street (LOS E during PM peak hour)
- Intersection 19: Mission Street / King Street-Union Street (LOS F during AM peak hour and LOS E during PM peak hour)
- Intersection 23: King Street / Storey Street (LOS F during PM peak hour)
- Intersection 30: Highland Avenue / High Street (LOS E during AM peak hour and LOS F during PM peak hour)

3.5.14.4 2010 With Project (Family Student Housing) Operational Analysis

Intersection Operational Analysis

The 2010 With Project FSH intersection turning movement volumes are shown [Figure 3-6, 2010 With Project Intersection Volumes](#). The level of service calculations for the 2010 With Project (FSH) analysis are shown in Table 3-11. The table compares the FSH project conditions with 2010 Without Project (Baseline) conditions and identifies whether the project causes a significant impact based on the standards of significance.

Table 3-11
2010 Without Project and With Project (FSH) – Intersection Levels of Service

#	Intersection	Type of Control	Peak Hour	LOS Standard	2010 (Without Project)		2010 (Plus Project)		Project % of Total Traffic	Met Signal Warrant Analysis ^a	Significant Impact
					Delay (sec)	LOS	Delay (sec)	LOS			
7	Highway 1 / Western Drive	Signal	AM PM	D	23.9	C	23.9	C	-		NO
					25.3	C	25.6	C	-		NO
8	Empire Grade / Western Drive	TWSC	AM PM	--	54.8	F	76.9	F	6%	YES	YES
					207.7	F	347.3	F	9%	YES	YES
9	Empire Grade / Heller Drive	Signal	AM PM	--	5.2	A	5.6	A	-		NO
					8.2	A	8.4	A	-		NO
10	Bay Street-Coolidge Drive / High Street	Signal	AM PM	D	17.4	B	17.8	B	-		NO
					22.7	C	24.4	C	-		NO
11	Bay Street / Nobel-Iowa Drive	Signal	AM PM	D	11.5	B	11.5	B	-		NO
					10.8	B	10.8	B	-		NO
12	Bay Street / Escalona Drive	Signal	AM PM	--	13.4	B	13.5	B	-		NO
					7.2	A	7.3	A	-		NO
13	Bay Street / King Street	Signal	AM PM	D	11.1	B	11.1	B	-		NO
					58.2	E	62.4	E	2%		NO
14	Mission Street / Bay Street	Signal	AM PM	D	47.6	D	48.6	C	-		NO
					79.3	E	86.3	F	1%		NO
17	Mission Street / Laurel Street	Signal	AM PM	D	33.1	C	33.4	C	-		NO
					49.4	D	50.7	D	-		NO

**Table 3-11
2010 Without Project and With Project (FSH) – Intersection Levels of Service**

#	Intersection	Type of Control	Peak Hour	LOS Standard	2010 (Without Project)		2010 (Plus Project)		Project % of Total Traffic	Met Signal Warrant Analysis ^a	Significant Impact
					Delay (sec)	LOS	Delay (sec)	LOS			
18	Mission Street / Walnut Avenue	Signal	AM PM	D	31.1 18.6	C B	31.4 18.7	C B	- -		NO NO
19	Mission Street / King Street-Union Street	Signal	AM PM	D	97.9 71.5	F E	140.9 120.6	F F	<1% 2%		NO NO
20	Mission Street / Chestnut Street	Signal	AM PM	E	48.8 48.2	D D	50.8 50.7	D D	- -		NO NO
22	High Street / Storey Street	AWSC	AM PM	--	16.5 14.7	C B	17.0 15.3	C C	- -		NO NO
23	King Street / Storey Street	AWSC	AM PM	--	34.7 54.6	D F	34.9 55.1	D F	- 4%	- YES	NO YES
24	Mission Street / King Street (West)	TWSC	AM PM	--	19.5 25.8	C D	19.5 25.9	C D	- -		NO NO
30	Highland Avenue / High Street	AWSC	AM PM	--	48.7 152.4	E F	57.0 175.3	F F	>3% 4%	NO	NO NO
46	Heller / Upper Koshland Way (On-Campus)	TWSC	AM PM	--	31.2 28.7	D D	47.5 48.9	E E	7% 12%	NO	NO NO

TWSC – Two-Way Stop-Controlled

AWSC – All-Way Stop-Controlled

(a) These intersections have been found to meet warrants for the installation of traffic signals for existing conditions.

In 2010 With Project (FSH) conditions, the following intersections are projected to operate at unacceptable levels (LOS E or F):

- Intersection 8: Empire Grade / Western Drive (LOS F during both AM and PM peak hours)
- Intersection 13: Bay Street / King Street (LOS E during PM peak hour)
- Intersection 14: Mission Street / Bay Street (LOS F during PM peak hour)
- Intersection 19: Mission Street / King Street-Union Street (LOS F during both AM and PM peak hours)
- Intersection 23: King Street / Storey Street (LOS F during PM peak hour)
- Intersection 30: Highland Avenue / High Street (LOS F during both AM and PM peak hours)
- Intersection 46: Heller / Upper Koshland Way (LOS E during both AM and PM peak hours)

3.5.14.5 Project Impacts and Mitigation Measures

FSH Impact TRA-1: The project under the 2010 conditions would contribute to

unacceptable levels of service at two off-campus intersections (Empire Grade / Western Drive and King Street / Storey Street) and would also contribute more than 3 percent of the traffic at those intersections.

Significance: Significant

FSH Mitigation TRA-1: The University shall contribute its “fair share” (as defined in Section 4.14, Volume II of this EIR) toward the cost of the improvements identified in Table 3-12, to the two affected intersections.

Residual Significance: Significant and unavoidable.

The 2010 With Project (FSH) intersection impacts were identified based on the criteria used to evaluate project-level impacts. Based on City of Santa Cruz’s significance criteria, to be considered significant, project level increases in traffic at intersections that do not meet LOS standards must be more than three percent of the total traffic at an intersection.

As discussed above, under 2010 With Project (FSH) conditions, seven of the study intersections are projected to operate at unacceptable levels (LOS E or F): Empire Grade / Western Drive (LOS F during both AM and PM peak hours); Bay Street / King Street (LOS E during PM peak hour); Mission Street / Bay Street (LOS F during PM peak hour); Mission Street / King Street-Union Street (LOS F during both AM and PM peak hours); King Street / Storey Street (LOS F during PM peak hour); Highland Avenue / High Street (LOS F during both AM and PM peak hours); and Heller / Upper Koshland Way (LOS E during both AM and PM peak hours).

At two of these intersections (Empire Grade / Western Drive and King Street / Storey Street), which meet warrants for traffic signals, the project would contribute more than three percent to the total 2010 intersection traffic volumes resulting in significant intersection impacts. The impacts at these two intersections would be mitigated with the installation of a traffic signal. A signal warrant analysis was prepared based on the Peak Hour volume warrant, Warrant 3, for the unsignalized intersections that operate at unacceptable levels of service. Table 3-12, *Proposed Intersection Improvements*, below, presents the service levels that would be achieved by these traffic improvements.

**Table 3-12
Proposed Intersection Improvements**

#	Intersection	Improvement	LOS after Improvement
8	Empire Grade / Western Drive	Install Traffic Signal	AM LOS A PM LOS B
23	King Street / Storey Street	Install Traffic Signal	AM LOS B PM LOS B

To address the significant impact of the proposed project on off-campus intersections, the Campus shall implement FSH Mitigation TRA-1, under which the Campus would negotiate to pay its fair share of the cost of installing traffic signals at the two intersections. “Fair share”, as used in this mitigation measure, is defined in Section 4.14, *Traffic, Circulation and Parking*, of Volume II of this EIR, in relation to LRDP Mitigation TRA-2B. While the identified improvements would reduce the impact to a less-than-

significant level, the intersections that are affected are off campus and outside of the jurisdiction of the University, and it is therefore uncertain that the improvements would be carried out. The impact, therefore, is significant and unavoidable.

FSH Impact TRA-2: Parking demand for the FSH site would not exceed the available supply.

Significance: Less than significant

FSH Mitigation: Mitigation not required

Residual Significance: Not applicable

Currently (under 2004 baseline conditions) the 237 spaces serving the existing FSH complex are about 66 percent occupied. Projecting this occupancy and increasing it by an average factor of 15 percent, the 400 FSH units would generate about 304 parked vehicles. The proposed parking supply would be sufficient to accommodate this demand.

FSH Impact TRA-3: Traffic associated with demolition and construction of the FSH complex could result in conflicts with other vehicles, bicyclists, transit, and pedestrians, and could physically interfere with the campus Emergency Operations Plan.

Significance: Potentially significant

FSH Mitigation TRA-3: The Campus shall develop a construction traffic management plan to delineate and monitor construction routes and schedule, and monitor construction traffic into and through the FSH complex, in order to prevent conflicts between construction traffic, other vehicles, and pedestrians and bicycles.

Residual Significance: Less than significant

The proposed project would be redeveloped in two phases, each of which would entail substantial numbers of truck trips for offhaul of demolition debris and excess spoils, and for delivery of materials (as detailed in the Project Description, above), and would also involve the use of heavy equipment that would be working in close proximity to Heller Drive and to the occupied portion of the FSH complex.

Based on the anticipated construction activity, there would be no more than 20 peak hour truck trips that would be associated with the project. The project site is just inside the west entrance to the campus and is easily accessed via Empire Grade Road and Heller Drive, and construction traffic therefore would not impact the more heavily used and busy campus roads (such as McLaughlin Drive). However, construction equipment and truck traffic in and around the occupied portion of the FSH complex could increase potential conflicts with other vehicles, bicyclists, transit, and pedestrians near the Heller Drive / Koshland Way vicinity and within the complex. This would represent a potentially significant impact.

To mitigate this impact, the Campus will implement FSH Mitigation TRA-3, which requires the development and implementation of a construction management plan that would identify: times in which construction traffic would have the least potential for impacts (e.g., off-peak hour, etc.); construction

staging area and construction worker parking; times and routes for the delivery of fill material and demolition export; and routes to be used by heavy vehicles and equipment entering, working within and existing the complex. Implementation of this measure would mitigate the impact to a less-than-significant impact.

In addition, the Campus proposes to amend campus standards with procedures to provide that construction work is conducted so as to ensure the least possible obstruction to traffic. The amended Campus Standard, as described under LRDP Mitigation HAZ-9A, would apply to construction of the proposed FSH Redevelopment Project.

Cumulative Impacts

The cumulative impact of the 2005 LRDP, including the proposed project, on the transportation network is adequately addressed in LRDP Impacts TRA-1 and TRA-2. The LRDP-level traffic analysis took into account construction traffic that would be associated with ongoing construction on the campus over the life of the 2005 LRDP. The traffic associated with the FSH Redevelopment Project is a subset of the construction traffic that was accounted for in the LRDP-level analysis.

The proposed FSH Redevelopment Project and the Infrastructure Improvements Project would be under construction at the same time. Some of the infrastructure improvements that are proposed in the vicinity of FSH include water distribution line segments to the north and south of FSH, improvements to a natural gas pressure-reducing station, and two storm water dispersion manifolds, a detention basin, and other small utility or storm drainage improvements to the south of FSH. Construction at the FSH site would occur almost continuously for about 24 months per phase and thus could run continuously for four years, and it is anticipated that a number of the actions proposed under the Infrastructure Improvements Project (see Section 2.0 of this volume) could be undertaken simultaneously with the FSH construction period. Work on each infrastructure improvements generally would be completed in a few days. The volume of construction traffic associated with the Infrastructure Improvements Project would be small and relatively dispersed, and would likely not accumulate with FSH construction traffic except on a few occasions of a few days each. Due to the short duration of construction at any given infrastructure improvement site in the vicinity of the proposed FSH Redevelopment project, the cumulative construction traffic impact would be less than significant.

3.5.15 Utilities

3.5.15.1 Environmental Setting

Section 4.15, *Utilities* (Volume II), describes the existing utilities systems servicing UC Santa Cruz, including the existing FSH complex.

3.5.15.2 Impacts and Mitigation Measures

Standards of Significance. Refer to Section 4.15 (Volume II) for a discussion of applicable Standards of Significance.

Analytical Method. See Section 4.15 (Volume II) for analytical method relative to impacts on utilities.

Impacts Adequately Analyzed at the LRDP Level or Not Applicable to the Project. LRDP-level analysis of impacts related to the capacity of utility systems, including storm water, fire water, wastewater, solid waste, domestic water, electricity, and telecommunications took into account the increased demand from all of the projected development and population growth under the 2005 LRDP, including the proposed FSH Redevelopment Project. Adequate capacity is available in the utility mains that currently serve the site to handle the increased demand. Aside from minor alterations in connections, only on-site improvements to the domestic water, storm water drainage, natural gas and electric systems would be needed to serve the redeveloped complex. Environmental impacts from the development of the site, including on-site utility lines, are discussed in all the resource sections above and in all the resource sections in Volume I. No further analysis is required. Development under the FSH would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs, and implementation of the FSH Redevelopment Project would comply with federal, state, and local statutes and regulations related to solid waste.

Project-Specific Impacts and Mitigation Measures

Not applicable.

Cumulative Impacts

The cumulative impacts of campus growth under the 2005 LRDP are adequately addressed under LRDP Impacts UTIL-9 and UTIL-10. The proposed project would contribute to these cumulative impacts.

3.6 ALTERNATIVES TO THE PROPOSED PROJECT

CEQA requires an EIR to describe and evaluate a range of alternatives to a proposed project or alternatives to the location of the proposed project. The purpose of the alternatives analysis is to discuss ways that the objectives of the proposed project could be attained while avoiding or reducing significant environmental impacts of the proposed project. This process is intended to foster informed decision-making and public participation in the environmental process.

3.6.1 Project Objectives

Alternatives considered in the EIR should be feasible and should attain most of the basic project objectives. The guiding objectives of the FSH Project are to provide an adequate number of on-campus housing units for students with families, and additional child care capacity in an integrated Early Education and Child care Center. Specifically, campus objectives in the redevelopment of FSH complex are to:

- Develop additional housing units that are as affordable as feasible, in support of the 2005 LRDP student housing goals
- Increase the campus inventory of Family Student Housing to provide more opportunities for student families to live on campus

- Create an accessible and easily maintained residential community for students and their families
- Provide opportunities for students with families to participate fully in the life of the campus and community
- Include appropriate amenities for student families, such as an Early Education and Child care Center, open space, and bicycle, pedestrian, and transit facilities, to reduce the need for residents to use motor vehicles on campus
- Make the most efficient use of the site in order to minimize the potential use of undeveloped lands elsewhere on campus
- Provide adequate space to accommodate the demand for child care on campus;
- Consolidate child care administration facilities in order to strengthen the child care program

3.6.2 Significant Impacts of the Proposed Project

The alternatives analyzed for a project should focus on reducing or avoiding significant environmental impacts associated with the project as proposed. As the analysis in Section 3.4, *Environmental Setting, Impacts, and Mitigation Measures*, shows, the proposed FSH Redevelopment Project has the potential to result in significant impacts with respect to: deterioration of the visual character and quality of the project site (FSH Impact AES-3); result in new light and glare (AES-4); PM₁₀ emissions during construction (FSH Impact AIR-1); conflict with the Air Quality Management Plan (FSH Impact AIR-4); nesting raptors (FSH Impact BIO-2); an archaeological site (FSH Impact CULT-1); caves in Cave Gulch (FSH Impact CULT-2); construction on expansive soils (FSH Impact GEO-1); construction on karst topography (FSH Impact GEO-2); exposure to contaminated building materials (FSH Impact HAZ-1); erosion and polluted runoff (FSH Impact HYD-2); construction noise (FSH Impact NOIS-1); traffic at two off-campus intersections (FSH Impact TRA-1); and construction traffic hazards (FSH Impact TRA-3). The alternatives to the proposed project are evaluated for their ability to avoid or reduce these impacts. Note that the majority of these impacts are reduced to less-than-significant levels by mitigation included above.

3.6.3 Alternatives Considered but Rejected as Infeasible

One alternative was considered for the project but was rejected because it did not meet project objectives and was found to be infeasible for technical, environmental, or social reasons. Under this alternative, the Campus would renovate the existing housing at the existing FSH complex. No additional housing would be constructed and the new child care center would not be built. This alternative would not meet the project objectives of developing additional housing units for student families, developing the site at a higher density, keeping the housing more affordable over the long term consolidating administrative facilities, or providing adequate space to accommodate the demand for child care on campus, and therefore was rejected.

3.6.4 Alternatives Evaluated in Detail

This section presents a qualitative evaluation of the Reduced Development Alternative, the North Campus Addition Alternative, and the No Project Alternative. Discussion for each alternative includes a brief description, an impact analysis, and a summary comparison with the proposed project. The alternatives were examined for their ability to meet project objectives, for their feasibility of implementation, and their ability to further reduce or avoid the significant impacts of the proposed project. Under each alternative, each of the resource areas with potentially significant project-related impacts is addressed under a separate subheading; all other resource areas are discussed under a single subheading.

3.6.4.1 Alternative 1: Reduced Development Alternative

Description

Under this alternative, the FSH complex would be built at the same site as proposed and within the same footprint, but instead of 400 housing units and an EECC, the complex would be redeveloped with the same number of housing units (about 200) as at the present time. The child care center would not be expanded, and would continue to serve only 78 children. Because the number of units would not increase over existing levels under this alternative, there would be no need to expand the site by 4 acres, as would be necessary under the proposed project. Furthermore, because only 200 units would be built, under this alternative the entire complex would be demolished and redeveloped in a single phase, as compared with two phases under the proposed project.

Impact Analysis

Aesthetics. The alternative would have reduced potential, relative to the proposed project, to result in significant impacts with respect to visual character and quality due to redevelopment of the site. The Reduced Development Alternative would develop the site less densely than under the proposed project, and would not require the removal of several 3.8 acres of trees that would have to be removed under the proposed project. It is anticipated however that the potential impact of the proposed project could be reduced to a less-than-significant level through sensitive siting and design review.

Air Quality. The alternative would avoid the significant impact of the proposed project with respect to the Air Quality Management Plan, because the alternative would not increase the number of housing units and the residential population of the complex over existing levels. The construction-phase impact from grading emissions would also be avoided under the Reduced Development Alternative, as the redeveloped complex could be developed on the footprint of the current complex, and significant cut and fill likely would not be necessary. The reduced level of construction would also reduce the speculative impact of the proposed project with respect to human health risk from TAC emissions during construction. However, because the impact is speculative, no conclusion can be drawn as to whether it would be reduced to a less-than-significant level under this alternative.

Biological Resources. Because, under the alternative, additional acreage would not be developed at the project site beyond the existing developed facility, the alternative would have reduced potential to affect nesting raptor habitat because the adjacent wooded area would not be cleared.

Cultural Resources. The potentially significant impact of the proposed project to a known archaeological site, which is associated with the construction of a detention basin near the Empire Grade Road / Heller Drive, would be similar under both the project and the alternative, as similar storm drainage facilities likely would be needed. However, if this facility is not needed because of the reduced impervious surface associated with the alternative, the potential cultural resources impact would be reduced.

Geology, Soils, and Seismicity. The significant impact of the proposed project with respect to construction on karst topography would be avoided under the alternative, because the FSH complex would not be expanded into the Karst Hazard 3 area. The significant impact of the project with respect to construction on expansive soils would still occur but would be reduced to a less-than-significant level with mitigation.

Hazards and Hazardous Materials. The alternative would have similar potential to the proposed project to expose workers to contaminated building materials, but would have no potential for exposure of residents or children at the child care facility, since the residential facility and the child care center would be vacant during construction.

Hydrology and Water Quality. The Reduced Development Alternative has less potential to result in significant hydrological and water quality effects than the proposed project, because the alternative would develop the site at lesser density and, thus, would be expected to have less area of impervious surface that would contribute to runoff.

Noise. The significant impact of the proposed project related to construction noise at residential receptors would not occur under the alternative, because all units would be vacated and demolished prior to construction, so there would be no sensitive residential receptors within 100 feet of the construction site.

Population and Housing. The Reduced Development Alternative would displace housing for 200 families, and families that might have resided in the FSH complex likely would have to seek housing off campus for the 2-year duration of construction. Under the proposed project, only 98 families would be affected in this manner. In both cases the impact would be less than significant, because it would be temporary.

Traffic, Circulation and Parking. Because the size of the development and its population under the alternative would be the same as under existing conditions, no new daily trips would be added to campus and city streets by the proposed project. Therefore, the significant impacts of the project on off-campus intersections would not occur. The construction-phase traffic impact would be approximately the same as for the proposed project, depending on whether the alternative required cut and fill similar to the proposed project, but potentially significant construction traffic hazards would be reduced to less-than-significant levels by the same measures under both the proposed project and the alternative.

Other Resources. No project-specific significant impacts on agricultural resources, public services, recreation or utilities were identified for either the proposed project or the alternative.

Ability to Accomplish Project Objectives

The key objectives of the proposed project are to develop additional housing units in support of the 2005 LRDP student housing goals, create an affordable and accessible residential community for students and

their families, and provide opportunities for students with families to participate fully in the life of the campus and community. Objectives that rely on an increased supply of housing would not be met under this alternative because the number of housing units would not increase over current conditions. The alternative would be similar to the proposed project in meeting project objectives with respect to provision of open space; and bicycle, pedestrian, and transit facilities to reduce the need for residents to use motor vehicles on campus. However, because the child care facility would not be expanded under the alternative, the project objective with regard to provision of a child care facility with consolidated administrative facilities and adequate space to accommodate the demand for child care on campus would not be met. This alternative would also not meet project objectives of using the existing FSH site more efficiently and minimize the potential use of undeveloped lands on campus because the additional 200 units, to meet the LRDP student housing goals, eventually would have to be developed at other locations, such as on the north campus or as infill on the central campus.

3.6.4.2 Alternative 2: North Campus Addition Alternative

Description

Under this alternative, the FSH would be redeveloped as two housing developments of 200 units each; one at the existing FSH site, and the second at a new site on the north campus. [Figure 3-7, North Campus Addition Alternative](#), shows the location of the north campus portion of the development, an 11.6-acre parcel immediately north of Crown/Merrill Apartments that is designated Colleges and Student Housing (CSH) under the 2005 LRDP. The proposed child care facility/EECC would be included in the north campus addition with the same capacity as under the proposed EECC, and the FSH development at the existing site would not include a child care facility.

The development would proceed in two phases, as under the proposed project, but the two phases would not occur on the same site. During the first phase of development, 200 new housing units and the new EECC would be constructed as a new FSH complex, at the north campus site, while the existing FSH residential and child care facilities continued to function. Upon completion of the new FSH complex at the north campus site, the existing FSH complex would be vacated. The new housing units would be occupied and the child care operations at the existing site could be shifted to the new site. In the second phase of development, the vacated FSH complex at the current site would be demolished, and the northern half of the site would be redeveloped more densely, with 200 housing units on a smaller footprint, similar to the first phase of development under the proposed project.

The new north campus complex would include the sustainable design features and many of the design elements of the project as proposed, and would be developed at similar density as would occur at the project site under the proposed project, but the design of the northern addition site would be substantially adapted to the more level topography of the north campus site. The development of this new FSH complex at the site north of the Crown-Merrill apartments would require the construction of a segment of the north campus loop road, and utility extensions to the north of the existing utility network. This phase of development therefore could require a longer period of time than would be required for a single phase of development of the proposed project.

Impact Analysis

Aesthetics. The north campus addition alternative would have increased potential for adverse aesthetic effects relative to the proposed project, because it would require development of a new area that has not been previously developed. However, because the development footprint would be reduced by at least half, compared to the proposed project, the redevelopment of the existing site could have reduced aesthetic impacts, presuming that the southern area that would not be redeveloped would be regarded and restored subsequent to demolition.

Air Quality. The proposed project and the alternative would have a similar significant impact with respect to the Air Quality Management Plan, as both include an increased number of housing units on campus, which are not accounted for in the regional population projections and air quality planning efforts. The potentially significant construction-phase impact from dust emissions during site grading could be reduced, as the North Campus Addition Alternative site is largely flat and would not require substantial cut and fill. However, use of the north campus site would require road construction, and the associated grading would also produce PM₁₀ emissions. Potential health risk hazards from construction emissions of TACs are speculative, however, since under this alternative neither site would be occupied during construction, there would be no receptors on site, and therefore no potential for exposure.

Biological Resources. The North Campus Addition Alternative would have a greater potential to affect biological resources than the proposed project, because there is greater potential for special status species and habitat to be present at the north campus site. Although the alternative would reduce development at the existing FSH site, and would avoid the impact of the proposed project with respect to nesting raptor habitat at that site, there would be increased impacts to nesting raptor habitat at the north campus site, where up to 11 acres of wooded land would have to be cleared. Further, development of the north campus site, under the alternative, would result in impacts on northern maritime chaparral and high-density stands of Santa Cruz manzanita that would not occur under the proposed project. The alternative also would have a potential to impact San Francisco dusky-footed woodrat nests, which would not be affected by the proposed project.

Cultural Resources. Although, at the north campus site, the potentially significant impact to a known archaeological site would be avoided, the North Campus Addition Alternative would develop currently undeveloped land, which has an unknown potential to result in significant impacts on undiscovered archaeological resources and human remains. The increase in new ground disturbance at the site and in association with the new roadway could increase the potential for archaeological impacts; however, this potential impact is addressed at the program level under the 2005 LRDP EIR. Similar to the proposed project, this alternative has no potential for impacts to historic architectural features, since no features are present at the existing FSH complex or in the north campus addition area. The north campus site is underlain, in part, by Santa Margarita sandstone, which is paleontologically sensitive, so the alternative has the potential for a significant paleontological impact that would not occur under the proposed project.

Geology, Soils, and Seismicity. The significant impact of the proposed project with respect to construction on karst topography would be avoided at both the north campus site and at the existing FSH site, because the north campus site does not include karst topography, and the FSH redevelopment at the original site would not extend into karst hazard areas under the alternative. There is a potential that

expansive soils could be encountered at the northern site as well as at the project site but in both locations the impact would be mitigated to a less-than-significant level.

Hazards. Construction at the FSH site could expose construction workers to asbestos and lead, similarly to the proposed project, but would not expose occupants or children at the child care center to these materials, since the existing FSH site would not be occupied or used for child care during construction. Lands surrounding the north campus site are redwood forest, chaparral and mixed evergreens, and the latter two vegetation types have a higher risk of wildland fires. Therefore, the impact related to wildland fires would be potentially significant under the North Campus Addition Alternative, an impact that would not occur under the proposed project.

Hydrology and Water Quality. The proposed project would result in new impervious areas on the north campus site, which presently does not include impervious area. Impervious area would be reduced on the redeveloped FSH site, since only half of the site would be developed as housing; presumably the southern half of the site would be restored as pervious area. This would be a beneficial impact with respect to reducing storm water runoff in the Moore Creek drainage.

Noise. The North Campus Addition Alternative would avoid the significant impact of the proposed project related to construction noise in the northern area, because there are no sensitive receptors near the north campus site. Adverse noise effects at the existing FSH site would be reduced, relative to the proposed project, because the development would be vacant at the time of development, so no sensitive receptors would be exposed to construction noise.

Population. The Northern Addition Alternative would not temporarily or permanently displace housing, since the housing on the north campus would be available for occupancy before the existing FSH housing was vacated. However, the impact with respect to displacement of housing would, in any case, be less than significant, because the effect would be short term and temporary.

Traffic, Circulation and Parking. Because the population under the alternative would be the same as under the proposed project, the number of daily vehicle trips that would be added to campus and city streets would be the same as under the proposed project. However, the North Campus Addition portion of the alternative would be accessed via Glenn Coolidge and Hagar Drives rather than Empire Grade Road and Heller Drive. The alternative also includes development at the FSH site with a smaller population. Possibly, the significant impact of the proposed project at the intersection of Empire Grade Road and Western Drive would be avoided. The construction-phase traffic impact would shift locations under this alternative, since construction would begin in the north campus area and later continue at the FSH site. In either case, the same construction controls would apply.

Utilities. Because the north campus site is not served by any utilities, development of the FSH complex under the Northern Addition Alternative would require the extension of all utility systems to the north campus, which could result in potentially significant environmental impacts that would not occur under the proposed project, although these impacts could be mitigated to a less-than-significant level.

Other Resources. No project-specific significant impacts on agricultural resources, land use, public services or recreation were identified for either the proposed project or the alternative.

Ability to Accomplish Project Objectives

The North Campus Addition Alternative would meet many of the key objectives of the proposed project. It would develop additional housing units in support of the 2005 LRDP student-housing goals; create an accessible residential community for students and their families; and provide opportunities for students with families to participate fully in the life of the campus and community. Because the alternative would entail development of a new site and associated infrastructure as well as redevelopment of the existing site, housing created under this alternative could be more expensive, at least in the short term, and thus could be less affordable. On the other hand, the configuration of development in two sites would free up the south half of the existing FSH site, which would then be available for other uses that could include more housing. The alternative would provide an expanded child care facility, consolidation of child care administrative facilities, open space and other amenities, similar to the proposed project. Access to bicycle, pedestrian, and transit facilities would have to be developed along with the extension of the north campus road to the development. The development of two smaller communities rather than a single larger housing development, under the alternative, might also be a desirable feature of the alternative. This alternative would not maximize the use of the existing FSH site, and would use undeveloped lands on campus that would not be used by the proposed project.

3.6.4.3 Alternative 3: No Project

Description

Under the No Project Alternative, the FSH complex would not be redeveloped and the existing housing and child care facility would continue to be occupied as at the present time. To address the deficiencies and problems at the existing complex, the Campus would make necessary repairs as and when needed. In the absence of an increase in on-site family student housing, under this alternative more student families would seek housing off campus.

Impact Analysis

Aesthetics. The No Project Alternative would avoid the potentially significant impact of the proposed project with respect to visual character and quality of the site, as maintenance of the project would not entail tree removal, or increase the density of development or height of the buildings on the site.

Air Quality. The No Project Alternative would not add housing units and population to the campus and therefore would avoid the impact related to conflict with the Air Quality Management Plan. Because there would be no new construction on the site, the construction-phase significant PM₁₀ impact and the speculative impact from TAC emissions during construction would also be avoided.

Biological Resources. Impacts to biological resources would be avoided.

Cultural Resources. Impact to cultural resources would be avoided.

Geology, Soils, and Seismicity. Impacts related to geology and soils would be avoided.

Hazards and Hazardous Materials. The No Project Alternative would not have the potential of the proposed project to expose construction workers and occupants to contaminated building materials, since the alternative would not involve demolition.

Hydrology and Water Quality. The existing site may not have adequate infiltration and storm water facilities in place to avoid on-going impact with respect to erosion and polluted runoff, although it is likely that improved storm water controls would be installed over time, whether or not the FSH complex is redeveloped.

Noise. The impact related to construction noise would be avoided.

Population and Housing. The impact of the proposed project with respect to temporary displacement of existing housing would not occur; however, the project's benefit with respect to increasing housing supply also would not occur.

Transportation and Traffic. The No Project Alternative would eliminate the significant impacts of the proposed project on intersection levels of service at two off-campus intersections, and relative to construction traffic hazards. However, because the additional 200 housing units would not be constructed, those 200 students likely would live off campus and commute to the campus, and thus add to the daily vehicles trips to the campus under the 2005 LRDP. This would further aggravate identified LRDP-level impacts on study area intersections, parking and transit.

Other Resources. No significant or potentially significant project-specific impacts on agricultural resources, public services, recreation, or utilities were identified for either the proposed project or the No Project Alternative.

Compared to the proposed project, under the No Project Alternative about 200 additional student families would seek housing in Santa Cruz and other communities. Therefore, this alternative would increase the severity of LRDP Impact POP-3 on the regional housing resources. Traffic impacts also would worsen in conjunction with the housing impacts. All of the population-related cumulative impacts of the LRDP, including those on public services, recreation and utilities, would also increase in severity as more students with families would live off campus. Over time, it is likely that units in the FSH complex would gradually become less desirable or unfit for housing use, and eventually the housing would have to be replaced in the future. The cost of constructing the replacement housing in the future would be higher and could result in even higher rents for the students.

Ability to Accomplish Project Objectives

The No Project Alternative would not meet any of the objectives of the proposed project.

3.6.5 The Environmentally Superior Alternative

The No Project Alternative is often the Environmentally Superior Alternative because it avoids most environmental impacts. However, in this case, the No Project Alternative could worsen the impact of the proposed project with respect to housing demand and off-campus traffic, and result in an increased demand for public services and facilities in surrounding communities. For this reason, the Reduced Development Alternative appears to be the environmentally superior alternative. This alternative would avoid many of the impacts of the proposed project. It would not require expansion of the existing site that would be required for the proposed project, and thus would avoid potential impacts to nesting raptor habitat, and changes in visual character of the site as a result of tree removal. It would also avoid the proposed project's potential geological impact with respect to construction in a karst hazard area. Because

the alternative would house the same number of families as present, it would not conflict with the AQMP, nor would it produce new traffic or other population-related impacts. However, because the alternative would not house an increased share of the campus population, more families would have to seek housing off-campus, which potentially would result in additional traffic and other population-related impacts.

3.7 GROWTH-INDUCING IMPACTS

As required by the CEQA Guidelines, an EIR must discuss ways in which a potential project could induce growth. A project may be growth inducing if it directly or indirectly fosters economic or population growth or the construction of new housing, removes obstacles to population growth, or requires or encourages the construction of new facilities. According to CEQA Guidelines Section 15126.2(d), “it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.”

The proposed FSH Redevelopment Project would construct new housing that would accommodate some of the population growth anticipated under the 2005 LRDP. The potential growth-inducing impacts of development under the 2005 LRDP are analyzed in Section 6 (Volume II).

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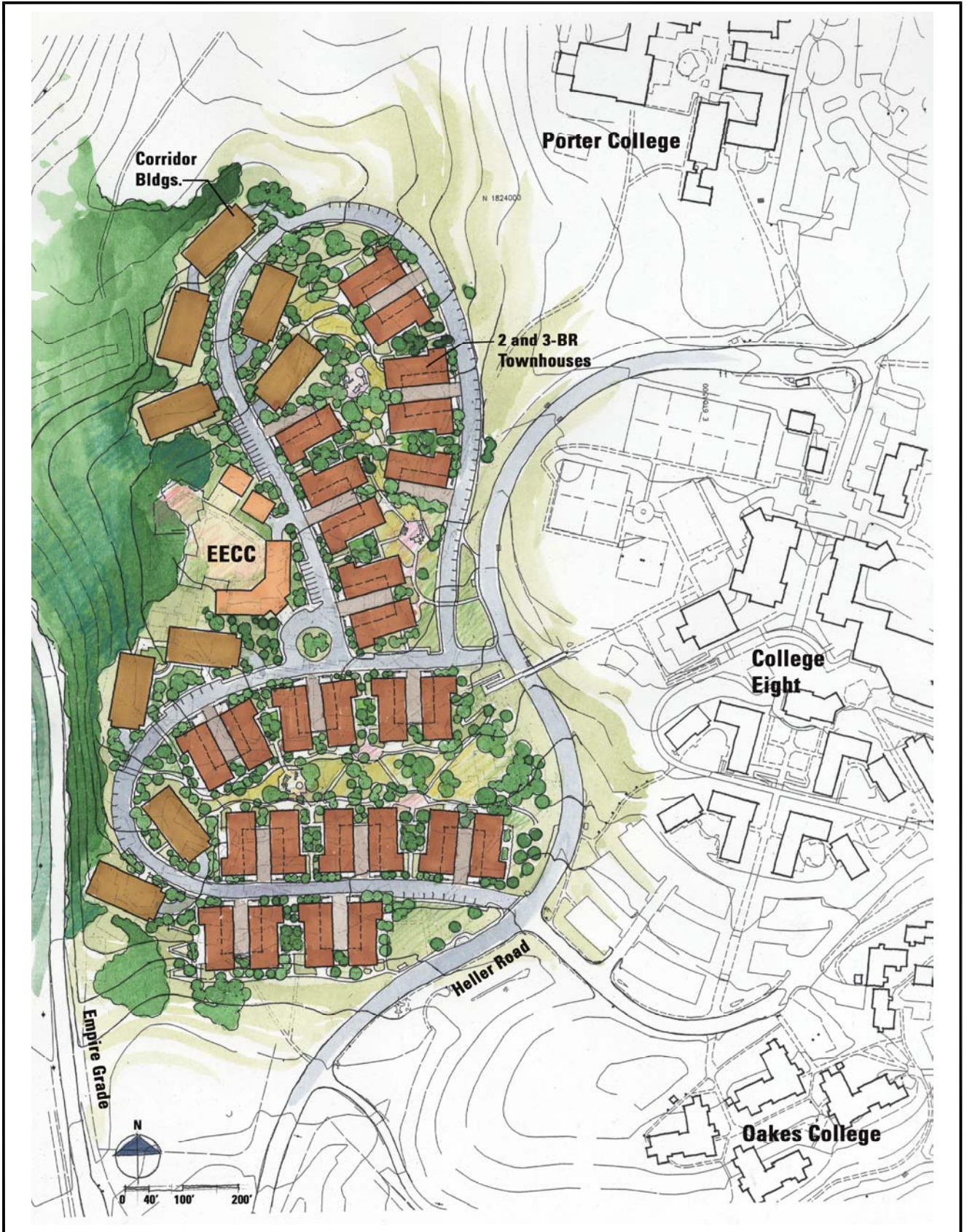
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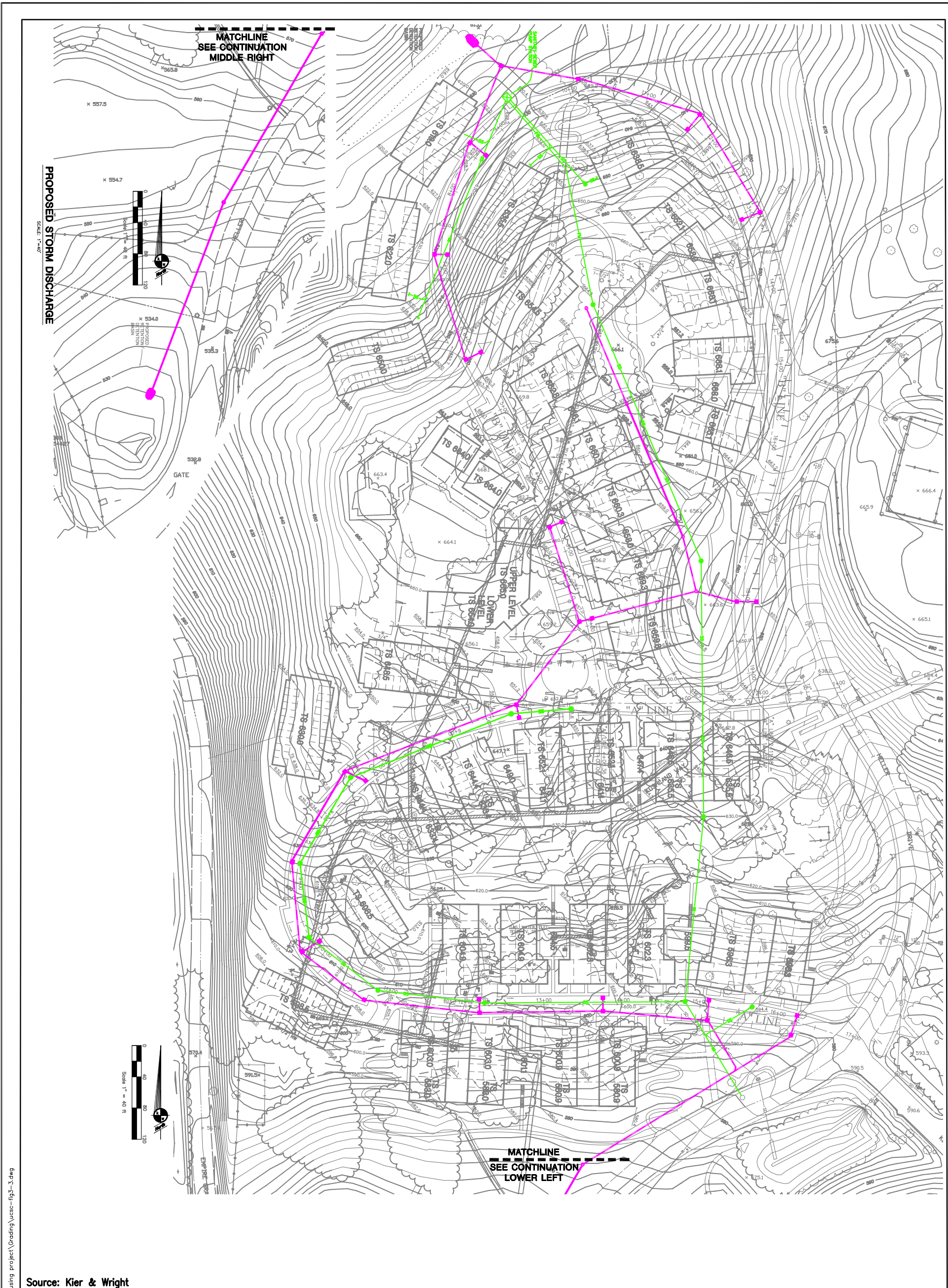
**FAMILY STUDENT HOUSING PRELIMINARY
SITE PLAN**

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Santa Cruz, California



FIGURE 3-1



PROPOSED STORM DISCHARGE
SCALE 1" = 40'

MATCHLINE
SEE CONTINUATION
MIDDLE RIGHT

MATCHLINE
SEE CONTINUATION
LOWER LEFT

Source: Kier & Wright

LEGEND	PROPOSED	EXISTING
CENTERLINE	---	---
SPOT GRADE	15.5	15.5
AREA DRAIN	●	●
CATCH BASIN (CB)	■	■
CLEAN OUT	●	○
CONTOUR	—23—	—23—
CURB	—	—
STORM DRAIN	—SD—	—SD—
SANITARY SEWER	—SS—	—SD—
WATER	—W—	—SD—
SANITARY SEWER MANHOLE	●	○

ABBREVIATIONS

FM	FORCE MAIN
HP	HIGH POINT
LP	LOW POINT
SS	SANITARY SEWER
TS	TOP OF SLAB

PRELIMINARY GRADING & UTILITY PLAN

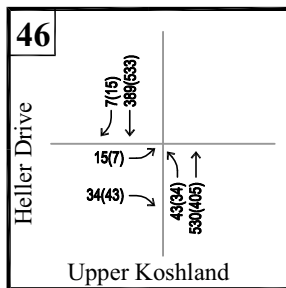
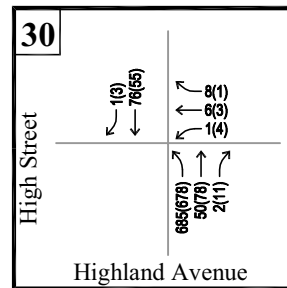
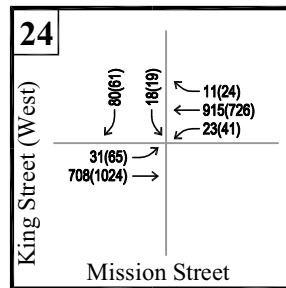
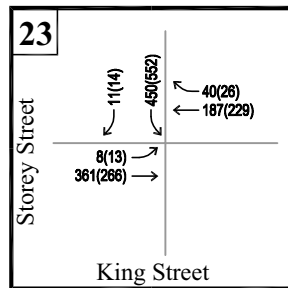
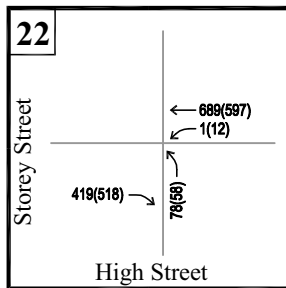
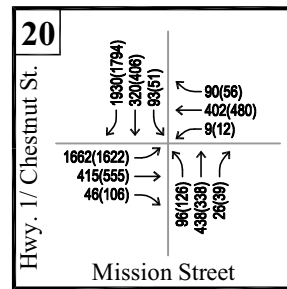
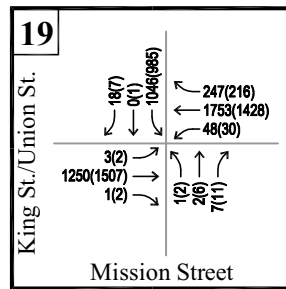
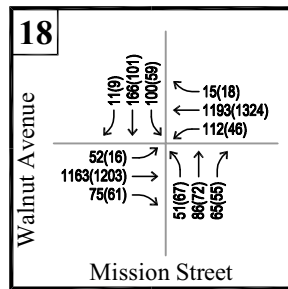
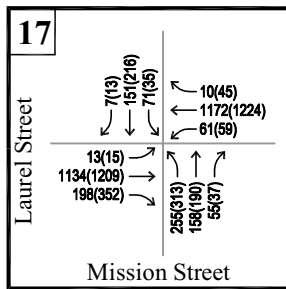
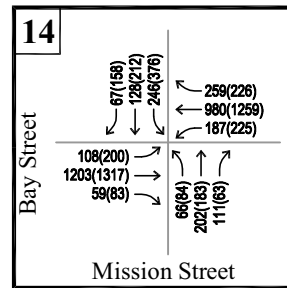
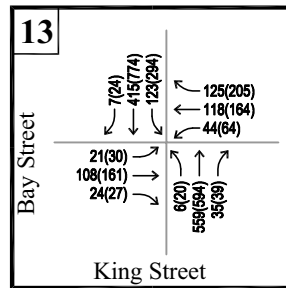
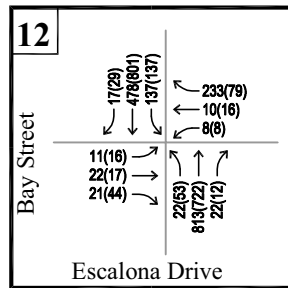
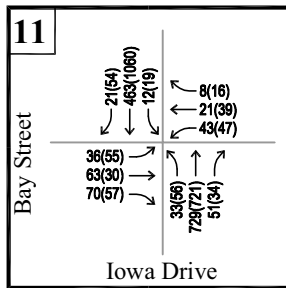
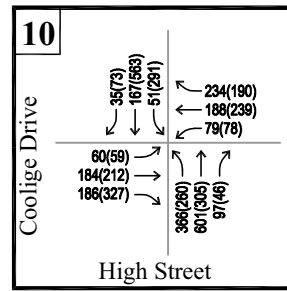
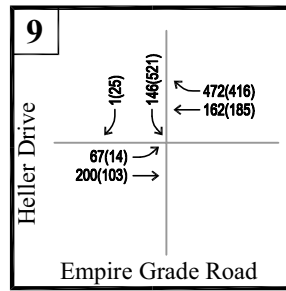
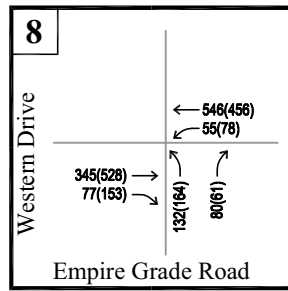
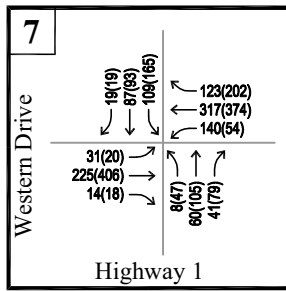
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Figure 3-3

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LEGEND

X STUDY AREA INTERSECTIONS

XX(Y Y) AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

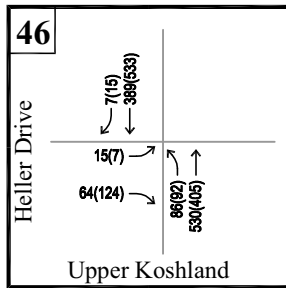
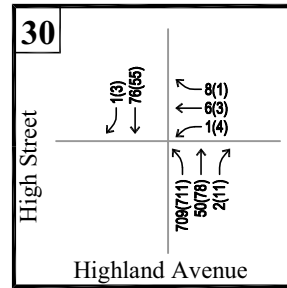
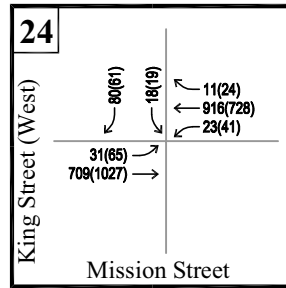
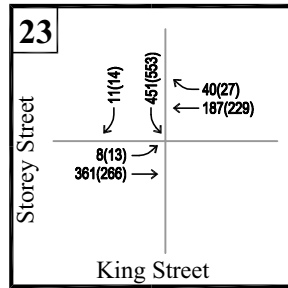
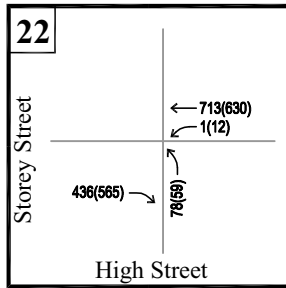
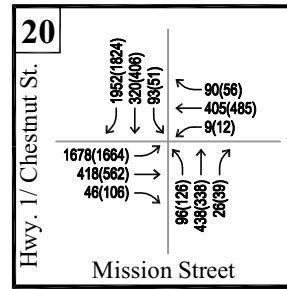
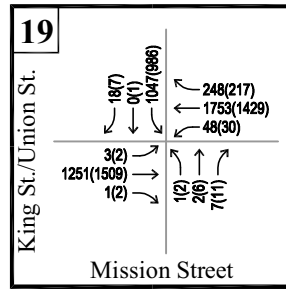
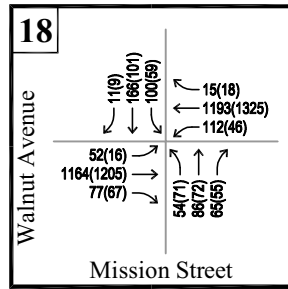
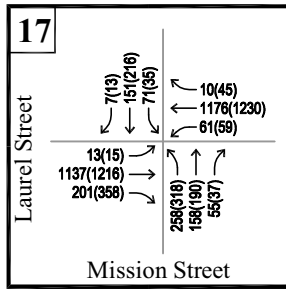
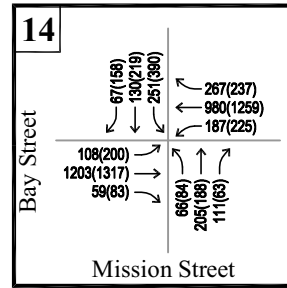
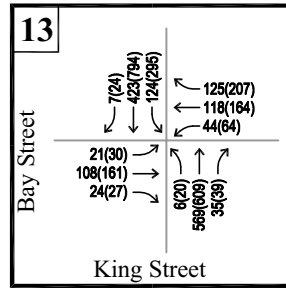
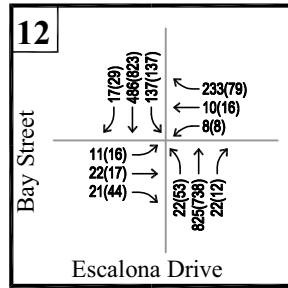
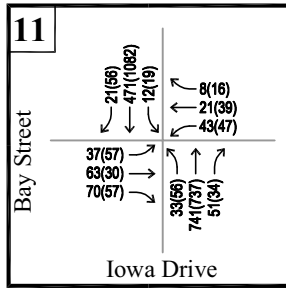
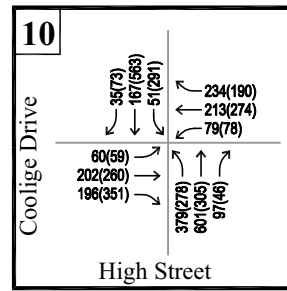
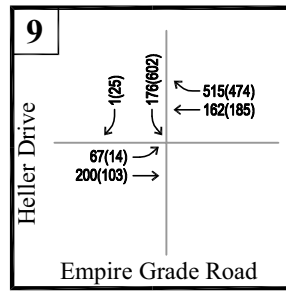
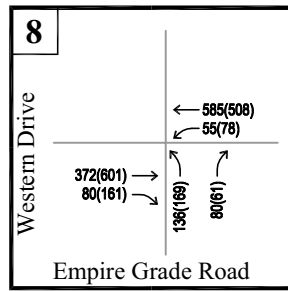
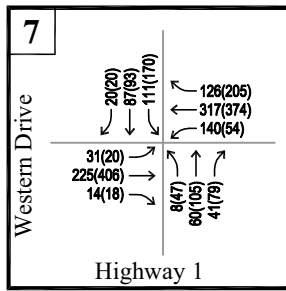
2010 WITHOUT FSH PROJECT INTERSECTION VOLUMES

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FIGURE 3-5



LEGEND

X STUDY AREA INTERSECTIONS

XX(YY) AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

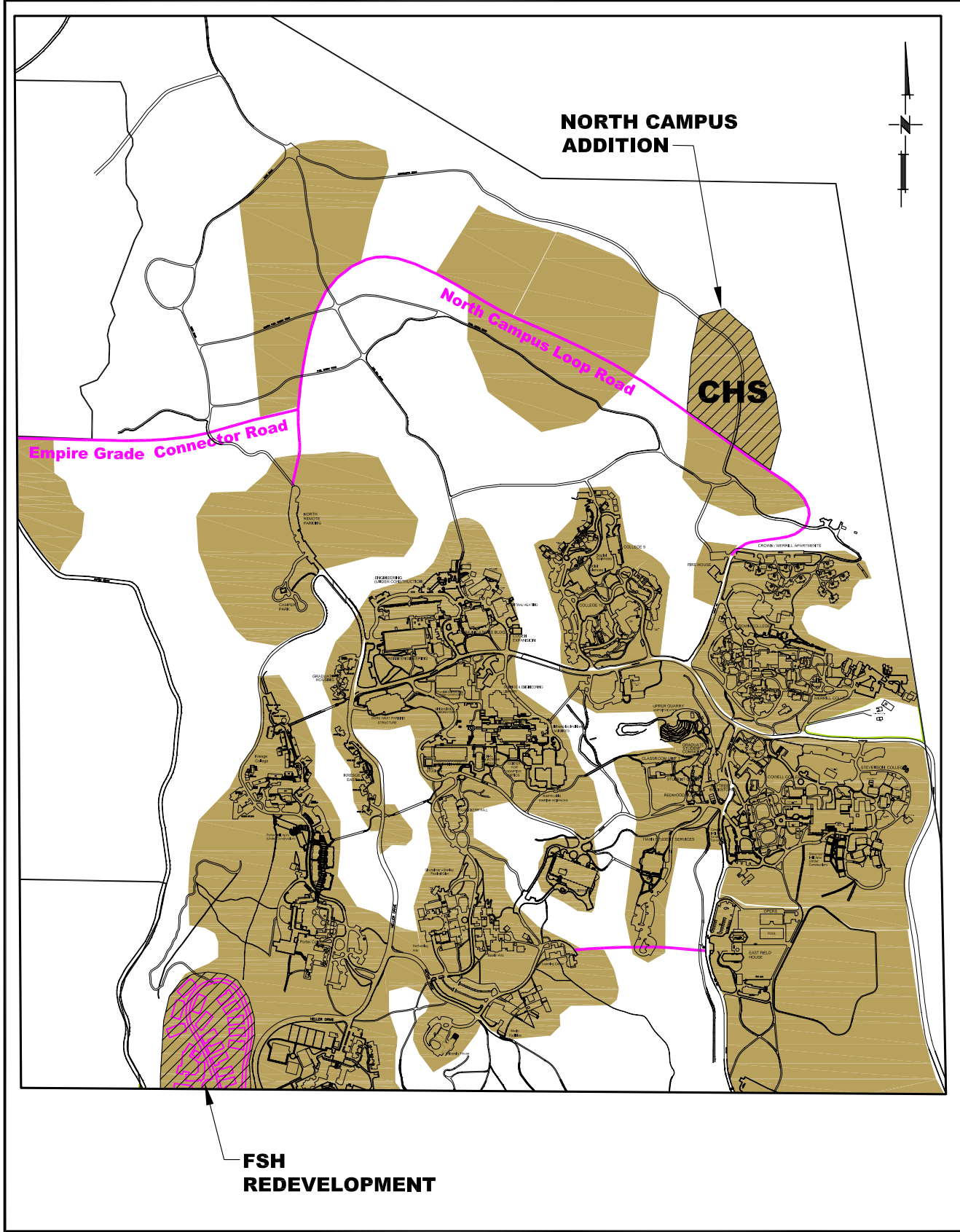
2010 WITH FSH PROJECT INTERSECTION VOLUMES

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FIGURE 3-6



Legend:

- Area proposed for development
- Existing development
- New Roads

NORTH CAMPUS ADDITION ALTERNATIVE

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FIGURE 3-7