Bend-Fort Rock Ranger District
Deschutes National Forest

OMSI CASCADE SCIENCE SCHOOL EXPANSION PROJECT

ENVIRONMENTAL ASSESSMENT

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CHAPTER 1. PROJECT DESCRIPTION

1.1 PLANNING AREA DESCRIPTION

The Oregon Museum of Science and Industry (OMSI) Cascade Science School (CSS) is located in the Deschutes National Forest (DNF), approximately 11 miles west of Bend, Oregon, at the western end of County Road 4601 (see Figure 1, Vicinity Map). The current permit area includes 10 acres, with current facilities being the historic Skyliner Lodge, rustic cabins, outhouses, and temporary structures consisting of 22 A-frame cabins and two yurts (see Figure 2, Existing Site Conditions). The legal description is Township 18 North, Range 10 East, section 10. Skyliners Lodge is located on the southern side of Tumalo Creek, approximately three miles from Tumalo Falls.

1.2 SCOPE AND NATURE OF PROPOSED PROJECT

The DNF is proposing to authorize a Master Development Plan for the long-term operation of the OMSI CSS campus at Skyliner Lodge. It is the policy of the Forest Service to require a long-range management plan be completed, which identifies expected activities related to the infrastructure and resource management within the permit boundary, prior to issuance of a long term Special Use permit.

CSS is currently being operated on an annual special use authorization under the authority of the Act of March 4, 1915 (Occupancy Permit). In order for CSS to continue existing levels of daily use, without impact to the environment or to historic structures, the facility must be updated. The Master Development Plan includes a new water delivery system, three restroom and shower buildings, and a storage and maintenance structure. A second permit would be issued for improvements off the current permit area, including a utility corridor to a new septic systems and an new set of fire suppression tanks. These improvements would allow CSS to expand its current teaching period to include late fall and winter, while maintaining its current daily maximum of 64 students plus a maximum of 20 teachers/ chaperones.

1.3 DECISION TO BE MADE

The Forest Supervisor will decide whether to authorize the issuance of a long term Special Use Permit for operation of OMSI CSS and to approve the construction of the improvements outlined under Alternatives 2 or 3, described below, and if so, under what terms and conditions.

1.4 FOREST MANAGEMENT AREA, PLAN DIRECTION, AND PARTNERSHIPS

Management activities in the CSS area are guided by the DNF Land and Resource Management Plan (Forest Plan), as amended by the Northwest Forest Plan (NWFP), and by policy and direction found in Forest Service Regulations which are implemented in the form of direction from line officers such as the Chief of the Forest Service, Regional Forester, Forest Supervisor, or District Ranger.

The Northwest Forest Plan establishes land allocations and overlays with overriding standards and guidelines to those of the DNF Plan. However, in some of the allocations the NWFP defers to standards and guidelines of the DNF Plan. A detailed description of the applicable Standards and Guidelines are included in Appendix A.

The CSS project area lies within an Administratively Withdrawn allocation under the Northwest Forest Plan. Administratively Withdrawn areas are identified in the current Forest Plan and include recreational and visual areas, back country, and other areas not scheduled for timber harvest. This means that, with the exception of Riparian Reserve Standards and Guidelines, the Northwest Forest Plan defers to the DNF Forest Plan's direction to those lands. Those portions of the project area adjacent to Tumalo Creek streams lie within a Riparian Reserve, which then provides additional direction on the goals and objectives for long-term management of the area.

The CSS site is located within the Tumalo and Forks subwatershed boundaries. The Forks subwatershed is a Tier Two watershed, contributing directly to the conservation of anadromous salmonids, bull trout, and resident fish species, and is, upstream of the project area, an important source of high quality water for the City of Bend.

The Skyliner Lodge area is within the Intensive Recreation Management Area of the DNF Plan. The goal of Intensive Recreation is:

> *To provide a wide variety of quality outdoor recreation opportunities within a Forest environment where the localized settings may be modified to accommodate large numbers of visitors.*

The DNF Plan addresses the historic nature of the Lodge under Standard and Guideline M11-13, which states:

> *Skyliner Lodge has the potential to serve as a hub for both summer and winter dispersed recreation. The Lodge may be developed for group use with limited overnight*

accommodations. Any development of the Lodge must consider its historic value and integrity. Water and sanitation facilities need to be developed before the Lodge can be effectively used. Other facilities could be developed on the site to supplement the Lodge.

The draft Strategic Business Plan for the National Forest of Central Oregon Ochoco and Deschutes, which reflects national direction of the Forest Service and the USDA Forest Service Strategic Plan (2000 Revision), stresses as one of its points the desire of the Forest Service and the Deschutes National Forest to improve the delivery of information, education, and interpretation. One important aspect of this delivery is through partnerships with outdoor and resource education providers, such as OMSI. OMSI uses this organization camp for educational purposes to reach numerous school age children and teach resource management and conservation fitting with Forest Service goals for education.

1.5 PROJECT SCOPING

Initial scoping of the proposal began with listing the proposal in the Spring 2000 (April-June) issue of the Central Oregon Interagency Schedule of Projects. The proposal has been listed in every subsequent issue. In addition, a letter describing the Proposed Action and requesting public comment was mailed to approximately 150 individuals, other agencies, and organizations on March 13, 2000. Forest Service specialists were consulted.

There are two opportunities for public comment on this proposal; the first was during the initial scoping process and at an informational meeting held by OMSI on February 24, 2000, and the second during the 30 day comment period once the EA is released.

The issues and concerns identified in the letters referred to three main topics:

- The potential impact of increased numbers of students on the area over the present time. Specific concerns related to this increase included traffic, fire danger, water quality, wildlife, recreation, quality of life and property value for existing homeowners in the Skyliner area.
- Cumulative effects of this project with other proposed and ongoing projects in the area.
- The compatibility of the temporary buildings and proposed new buildings with the historic nature and condition of the Lodge.

1.6 SUMMARY OF NON-AGENCY AND AGENCY COMMENTS ON THE PROJECT

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CHAPTER 2: PURPOSE AND NEED FOR PROJECT

2.1 DESIRED FUTURE CONDITIONS

Basic improvements are needed on the CSS site to make the organization camp a safe and comfortable experience for students over the long term. The desired future condition for the organization camp would be an all-season, self-supported, education facility with overnight accommodations that meet all Federal, State, and local codes and laws for the health and safety of the students. *(Note: the Desired Future Condition discussed below would be met through implementation of Alternative 3 as described in Section 3.4).*

Currently, OMSI operates CSS on a one-year special use authorization renewed annually. The Forest Service has been unwilling to issue a longer term authorization until a Management Plan was submitted and approved that would address all changes and improvements needed in the camp. The desired future condition would be to issue a long-term authorization (up to a 20-year term) for continued operation of the camp and investment in needed facilities.

Upon securing a 20-year Special Use Permit, OMSI will embark on capital improvements of approximately $1,500,000.00, for the completion of the temporary installation of the five clusters of portable A-frames, a storage/supply building (to replace two A-frames), and the construction of the restroom and shower structures. The new buildings will be winterized and will replace ten 1950's vintage student shelters and supplement the 2800-square-foot Skyliner Lodge, a historic structure. The desired future condition is a winterized facility that supports educational program for up to 64 students plus chaperones and CSS staff throughout the year.

The capital improvements would include all the infrastructure improvements needed on the site, including underground power and phone lines, a fire suppression gravity feed water supply from two new water tanks, a new waste water septic system, and restrooms/shower facilities.

The present water and wastewater systems consist of a well and water lines to the Lodge, outdoor hand

washing sinks at the outhouses, and a 1930s-era septic system for the Lodge. The desired future condition is a water system capable of supplying an adequate quantity and pressure for the restroom and shower facilities, cooking, and to operate the Lodge fire protection system. The gravity water system will provide water in case of an electrical failure. A new septic system that ties the Lodge and restroom facilities together and removes the wastewater to a new drainfield will provide added protection to the Tumalo watershed.

Currently, the camp has two outhouse facilities for students and staff. The desired future condition would be restroom facilities with handicap-accessible flush toilets, sinks, and showers. Flush toilets and sinks would be more sanitary and comfortable than the existing outhouses. Showers located at the camp would eliminate the need to transport students into Bend during longer class sessions. Two separate facilities are needed to serve the boys and girls sides of the camp.

At this time, CSS stores equipment for classes in the Lodge. The desired future condition includes a separate storage building to allow storage of educational and outdoor equipment in a location that reduces impacts to the Lodge.

Currently, when students arrive at CSS, gear is placed in an A-frame structure located near the entrance of camp. The future desired condition would be to replace this A-frame with a conveniently located and more architecturally compatible structure.

Continued use of the lodge by OMSI would allow CSS to reach more children to promote an interest in environmental subjects and care for nature and public lands. Being able to use the improved overnight facilities would allow the expansion of the use into the fall, winter, and spring seasons. Public use of the West Loop ski trail and the Tumalo Creek mountain bike trails continue to grow and is compatible with the expansion of the school programs.

Other desired conditions were identified during the scoping process (see Section 1.5) as well as follow-up discussions with DNF, the project engineer, and project architects. These include:

An additional restroom/shower facility to serve the staff housing.

- By 2010, the desired future conditions includes a new kitchen and dining hall facility to minimize long-term wear on the historic Skyliner Lodge, meet new health code requirements, and to replace the teaching space loss caused by the removal of two 30-foot diameter yurts. Part of the desired future condition is the removal of the two yurts, which are not architecturally appropriate to the historical style of Skyliner Lodge.
- An additional part of the desired future condition is that, by 2010, all eight of the original student cabins will be replaced with Oregon State Park style log cabins.
- The two original counselor cabins will be replaced with Oregon State Park style log cabins that will combine teacher or chaperone housing with state-required infirmary facilities. There would be one teacher/infirmary unit adjacent to the boys area and one adjacent to the girls area.

- Another part of the desired future condition is the removal of all A-frame cabins from the site, except for ten A-frame cabins that will remain in the staff area away from the Lodge, in a location where they will not pose an architectural conflict .

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CHAPTER 3. ALTERNATIVES CONSIDERED

Alternatives were derived in response to the Purpose and Need, Desired Future Condition, and the issues identified during the project scoping, and follow-up discussions with DNF, the project engineer, and the project architect.

One alternative was considered but not developed. Three alternatives were formulated and studied in detail.

3.1 ALTERNATIVES CONSIDERED & ELIMINATED FROM FURTHER CONSIDERATION

The discontinuation of the existing permit and removal of temporary facilities was considered and eliminated from further consideration for several reasons. Implementing this alternative would result in the closure of CSS, and the loss of CSS's natural science and resource education programs. Closure of CSS would require DNF to find another user for the lodge or leave vacant. In addition, a permanent facility such as CSS has been beneficial to the preservation of historic Skyliner Lodge. Prior to CSS, the Lodge had been unprotected and subject to impacts from weather, aging, and vandalism. OMSI has invested in upgrading and protecting the Lodge, an activity that DNF has not had sufficient resources to accomplish. Since DNF has had a satisfactory relationship with OMSI, changing users would not serve the purposes of DNF.

3.2 ALTERNATIVE 1: NO ACTION

Alternative 1, the No Action Alternative, would consist of continuing with one-year authorizations. The facility would be retained in its current condition, and no changes to existing yurts, A-frames, water and septic systems, or electrical systems would occur (see Figure 2: Existing Site Conditions). Programs would continue to focus on spring and summer, with fall and winter programs limited due to inadequate facilities. Use of Skyliner Lodge as a dining hall would continue.

Under the No Action alternative, DNF would continue to manage the site under current direction afforded by the Forest Plan. No reduction of risk of wildfire hazard, building improvements, projects to protect water quality, or removal of historically inappropriate structures would occur. The No Action Alternative will provide a baseline from which to compare the other alternatives and their effects.

3.3 ALTERNATIVE 2

Alternative 2 would consist of issuing a long-term special use authorization based on the Master Plan, as described below. This was the Alternative that was described during the Scoping Process.

The number of students served on any day would remain similar to existing conditions (a maximum of 64 students, 10 teachers/chaperones, and 10 staff per day) but the teaching season would be able to be extended into the fall, winter, and spring seasons because of improved facilities.

Cascade Science School plans to continue to conduct programming for up to 64 students at a time (plus a maximum of 20 chaperones, teachers, and other staff), while taking advantage of the winterized cabins to provide comfortable, safe housing over a broader operating season. Figure 3 and Figure 4 illustrate the CSS Master Plan under Alternative 2.

The Master Plan describes a number of actions that are needed at the Skyliners' facility. These are summarized below.

All new structures will compliment the 1930's architectural style of Skyliner Lodge. The 1930's C.C.C. camps often had a log lodge as a central building and single-story, board and batten frame or log construction dining halls and dormitories. In addition to architectural style, safety, energy efficiency, longevity, and low maintenance are high priorities for the buildings. High insulation values and metal roofing with 3+ foot overhangs for fire protection and snow shedding will be included. Water systems that can be easily drained for temporary winterization are planned. All buildings will be designed to meet modern handicapped accessibility standards. Water conserving fixtures are planned where appropriate to conserve water.

Skyliner Lodge will continue to serve as the primary education building with a meeting area, natural history room, and library. It will continue to be the architectural and operational center of the science school. Given the historic nature of the Lodge and its placement on the National Historic Register, the building will continue to be maintained without architectural change or modification.

The A-frame student cabins will be improved to include connecting deck-style porches and electricity.

Two separate rest rooms and shower facilities will be built (Figure 5 and Figure 6), one near each of the two sets of student cabins. Each of the restroom/shower facilities will be winterized, with two sides each having two showers, two toilets, and three sinks. The restroom/shower facility on the south side of camp would also have one urinal on each of its two sides.

A new storage and supply building will be constructed, as shown in Figure 7.

To provide for adequate water supply and pressure even in the event of power failure, a gravity feed water supply is planned. This will consist of two above-ground epoxy steel water storage tanks placed high enough above the Lodge to provide a minimum of 45 psi of water pressure throughout camp, and large enough to run the building's internal and external sprinklers for an extended period of time. The tanks will also provide water to external fire hydrants on the site.

A new septic system for the science school will be located away from the Lodge and creek on DNF lands south and east of the Lodge. The system will be placed through a recent timber harvest area, where the small trees currently need thinning, to achieve minimal disruption of the forest. The septic drain field will be protected with placement of large boulders and signs.

3.4 ALTERNATIVE 3: PROPOSED ACTION

Alternative 3 was developed in response to issues raised during public and agency scoping, and would consist of the Master Plan described in Alternative 2 (see Figure 3 and Figure 4) along with the following additions:

- Construction of a staff restroom and shower facility, with a kitchenette, will be located adjacent to the staff housing area. This staff commons building will have an open living room area with a small kitchenette (sink, range, refrigerator, and microwave), and will be connected to an uni-sex restroom with 4 sinks, two showers, two toilets, and one urinal. The showers, toilets, and urinal will each be set in individual doored stalls, with each having own light, fan, and full-length door to insure privacy. The shower stalls will have a small changing area, prior to stepping into the shower proper. The footprint of the staff commons building will be around 24'x32', including a six-foot wide covered entrance porch.
- Two small cabins will be constructed to accommodate a teacher or chaperone. Each of these cabins will include an infirmary with a sink, toilet, shower, and a washer and dryer. One cabin will be built near the boys area and another near the girls area.
- Construction of a new kitchen and dining hall facility (Figure 8 and Figure 9) to minimize long-term wear and tear on the historic Skyliners Lodge, to meet all current health codes, and to free up teaching space in the Lodge to allow for removal of the two 30' diameter yurts. The camp's office operations will be moved to the new dining hall.
- Construction of eight student cabins, to replace the eight original student cabins (and to replace the 12 current student A-frame cabins).

3.4.1 Proposed Schedule of Improvements under Alternative 3

Phase 1:

- Completion of the temporary wiring of the A-frame cabin clusters.
- Installation of the new septic system.
- Installation of the gravity feed fire protection water supply system in the form of two epoxy steel above ground water tanks.
- Construction of the first restroom/shower building.
- Construction of the storage and supply building.
- Underground placement of current power line into site.
- Removal of the four A-frame cabins located closest to the Lodge and turn around circle.
- Construction of the first teacher/chaperone and infirmary building.
- Construction of staff restroom/shower/kitchenette building.

Phase 2:

- Construction of the second restroom/shower building.
- Removal of the two outhouses.
- Construction of the second teacher/chaperone and infirmary building.

Phase 3:

- Construction of the new kitchen and dining hall building.
- Removal of the two 30' diameter yurts.

Phase 4:

- Construction of eight new student cabins, to replace the eight A-frame cabins.
- Removal of the twelve student A-frame cabins (with five being relocated to the staff cabin area), and all remaining original student cabin.

Ideally, the first two building phases of the facility improvements will be completed in the first season in order to quickly implement an extended season of operation for the site. However, plans are in place to phase-in expanded operation of the facility over two or more years as different buildings are completed. Phases 3 and 4 of the construction program will be completed before December 31, 2009.

During the capital improvement effort, all engineering and architectural plans for the projects will be completed and submitted to the DNF for approval. Subsequent to DNF approval, all plans will be submitted to the state and county regulatory and permitting agencies with authority over the project. Prior to ground breaking on an improvement project, all permits for the project will be provided to the DNF for final approval.

All phases of the project would include ongoing routine maintenance, shrub and dead fuel removal for fire prevention, revegetation of disturbed areas, as well as noxious weed control, as described in Chapter 3 (Existing Conditions and Environmental Results).

3.5 MITIGATION MEASURES COMMON TO ALTERNATIVES 2 AND 3

The following mitigation measures would be implemented:

1. Accidental transport of weed seed will be limited through requiring clean equipment, including contract and permit clauses to prevent the introduction or spread of noxious weeds by contractors and permit holders. Prior to entry into areas that are subject to the cleaning provision, Forest Service and other vehicles will be properly cleaned according to the Equipment Cleaning Clause approved by the Regional Forester for use in contracts.
2. Spread of existing populations will be avoided through pre-treat of weed populations in the construction are to reduce populations before construction begins. Herbicide treatment may be appropriate, and is covered by the DNF Weed Environmental Assessment.
3. New infestations during construction and maintenance will be prevented by minimizing ground disturbance and clearing limit widths, using weed free gravel and other materials, avoiding the staging of equipment in weed infested areas, and mowing areas with clean equipment.
4. Early detection and control of weeds will be accomplished by monitoring areas disturbed by activities associated with the ground work, such as the septic field, documenting and mapping any newly discovered sites, and manually removing any new weeds immediately.
5. Shade will be maintained to suppress weeds by minimizing the removal of trees and other vegetation especially on southern aspects.
6. Desirable vegetation will be re-established on bare ground to minimize weed establishment or spread through revegetation of bare soil; monitor seeding for effectiveness and reseeding if necessary.
7. CSS staff will be trained to recognize noxious weeds and manually remove new invaders.

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CHAPTER 4. AFFECTED ENVIRONMENT

4.1 NATURAL SETTING

4.1.1 Wildlife and Fish Species

4.1.1.1 *Forest Service Management Indicator Species*

The DNF wildlife biologist visited the project site on August 7, 2000 to obtain a site description and note any wildlife usage in the area. There is evidence of use in the area by several wildlife species including deer, ground squirrels, owls, and passerine birds. The project area does not provide critical habitat for any wildlife species, as there is existing development and human activity. The wildlife biologist's report is included in its entirety as Appendix B of this EA.

4.1.1.2 *Proposed, Endangered, Threatened, Sensitive (PETS), & Candidate Species*

A biological evaluation was conducted by DNF for proposed endangered, threatened, and sensitive (PETS) wildlife species potentially occurring on or near the project. Candidate species were included in the biological evaluation. The evaluation is included in its entirety as Appendix C of this EA. The following is summarized from the evaluation.

A field review occurred at the project on August 7, 2000. The only PETS species for which suitable habitat exists adjacent to the project area is the Canada lynx (*Felis lynx Canadensis*). No suitable habitat exists for any other listed species within the proposed project area.

The Canada lynx is a federally listed Threatened species. Lynx occupy boreal forest habitats. Their range is primarily in the northern states and Canada, but extends southward into the Cascades; they are considered a rare resident in Oregon. Lynx distribution and abundance of is largely tied to that of the snowshoe hare. The dense, shrubby habitat of these hares is a primary habitat component of the lynx, as is the mature, coniferous forest lynx require for travel, denning, and thermal cover.

The project area is within the Forest Service Tumalo Lynx Analysis Unit (LAU). An LAU is an area determined to contain the characteristics necessary for the Canada lynx to complete its life cycle, such as denning and foraging habitat. The Forest Service has certain design criteria, established by the 2000 Joint Aquatic and Terrestrial Programmatic Biological Assessment Project for the Canadian lynx, that projects within an LAU must meet.

The Skyliner Lodge and surrounding area has been in use since the 1930s. The habitat surrounding the Lodge and other structures does not provide foraging or denning habitat, but does provide travel habitat. Lynx have not been sighted in the area in the past, but are suspected to occur within the Tumalo LAU, perhaps within the Tumalo Watershed.

4.1.1.3 *Fisheries*

Tumalo Creek provides spawning gravel for wild reproducing rainbow trout which could be classified as native redband trout. The Forest Plan states that "emphasis will be on habitat improvement and will maintain or improve fish habitat" (M11-29).

4.1.2 Vegetation

4.1.2.1 *Threatened, Endangered, & Sensitive Plants*

A biological evaluation was conducted by DNF for threatened, endangered, and sensitive (TES) and Survey and Manage (S&M) plants potentially occurring on or near the project. It is included in its entirety as Appendix D of this EA. The following is summarized from the evaluation. DNF botanists surveyed the project area on September 18, 2000 and compiled a species list.

The nearest known populations of TES plants are populations of the green-tinged paintbrush (*Castilleja chlorotica*) three miles east of the project area, and Newberry's gentian (*Gentiana newberryi*), one mile west of the project area. No TES plant species were located in the survey. No high probability potential habitat for TES species was found in the project area.

4.1.2.2 *Survey and Manage Plants and Fungi*

There is a population of a S&M species, the forest brownwort (*Tritomaria exsectiformis*) in the wetland outside the southwest project boundary. There is a high probability that habitat for the liverwort (*Ptilidium californicum*), associated with large old growth stands of white fir, occurs in the area.

Fall fungi surveys were done to FS protocols. No rare species were found. The requirement for spring surveys was removed on January 10, 2001 by the Record of Decision for the Supplemental Northwest Forest Plan Environmental Impact Study.

4.1.2.3 *Noxious Weeds and Exotic Plants*

Noxious weeds are typically introduced by livestock, contaminated fill dirt, or on tires. Recently disturbed areas are particularly vulnerable to weed invasion. There are noxious weeds (spotted knapweed) within the project area from Skyliner road, across Tumalo Bridge, up Road 4603 and at the bridge at Tumalo Falls Day Use Area. Forest Service Manual (FSM) direction requires that Noxious Weed Risk Assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, FS policy requires that decision documents must identify noxious weed control measures that will be undertaken during project implementation (FSM 2081.03, 29 November 1995).

Aggressive non-native plants, or noxious weeds, can invade and displace native plant communities causing long-lasting management problems. Noxious weeds can displace native vegetation, increase fire hazards, reduce the quality of recreational experiences, poison livestock, and replace wildlife forage. By simplifying complex plant communities, weeds reduce biological diversity and threaten sensitive habitats. Potential and known weeds for the DNF are listed in Appendix D.

4.1.3 Wetlands

There is an area of identified wetlands located to the southwest of the project area. The wetland was delineated and surveyed in October 1999 and determined to be outside of the permit boundary.

4.1.4 Riparian Resources

The narrow riparian zones along Tumalo Creek and a small side drainage contain numerous alder trees, as well as willow species, some aspen, and grasses and reeds. Ground cover throughout the burn-area, as well as within some open spaces at CSS is dominated by manzanita, snowbush, and some currants. Riparian habitat in the CSS area is protected by education, student supervision, and fencing. Students participate in revegetation projects in some riparian areas.

4.1.5 Forest Resources

CSS is situated in a mixed conifer forest at an elevation of 4,750 feet. Situated at the confluence of an unnamed side drainage (which drains Tumalo Lake) and Tumalo Creek, the natural vegetation of the area is dominated by ponderosa and lodgepole pines, white fir, and Engleman spruce. To the north and west of the site the landscape is marked by young forest of ponderosa and lodgepole pine seedlings planted in 1980-81 following the Bridge Creek Burn of 1979, which replaced the entire forest stand. There are some trees that meet the classification of late and old structure.

4.1.6 Hydrology/Water Quality

Tumalo Creek is a source of high quality water. The average summer temperatures rarely exceed 60 F.

During the winter extensive icing occurs within the channel. Turbidity is usually relatively low but seasonally increases in the spring during the snow melt and at times of snow on rain or heavy thunderstorm events. Streambanks and unstable hillslopes along Tumalo Creek and a tributary stream Bridge Creek contribute sediment at these times. Bridge Creek, upstream of the project area, is a source of drinking water for the city of Bend and is among the purest for a surface water system in the United States. There are several private residences downstream of the project area with domestic use water permits on Tumalo Creek. The permits generally are 2.5 gallons/minute or less.

4.1.7 Air Quality

Air quality is currently good in the project area. Bend, Oregon is currently in attainment for State of Oregon air quality standards. The dry season often results in dusty conditions on roads and trails. In the winter, local inversion layers sometimes allow the concentration of wood stove smoke, affecting air quality.

4.1.8 Noise

The project area is generally quiet, with traffic noise typically being the only human-caused disturbance. Most noticeable would be large vehicles such as lumber trucks, buses serving CSS and local schools, and winter snow plows. Currently, Bend school buses make two round trips on Skyliners Road per day during the school year, or 360 round trips per year. CSS buses currently make approximately 80 round trips on Skyliners Road annually. When operating at capacity, CSS expects to approximately triple the number of round trips on an annual basis, for a total of around 240 round trips annually.

4.2 CULTURAL SETTING

4.2.1 Archeological and Historical

Skyliner Lodge was constructed in 1935 and 1936 for the Skyliners ski club of Bend. The Lodge was built by crews funded by the Works Progress Administration. Local logs and rocks were used in the construction and many items in the Lodge were handcrafted, including hardware and furnishings.

The Skyliner ski club used the Lodge as the center of winter sports including downhill skiing and jumping, cross-country skiing, and ice skating until the mid-1950's when ski lift equipment was lost to a fire. The club was then instrumental in the establishment of the Mt. Bachelor ski area. Since that time the Lodge has been used by various groups, including the Oregon State Grange, the Deschutes County Extension Service, Pacific Crest Outward Bound, and most recently, the Oregon Museum of Science and Industry.

On June 13, 1978, the Lodge was accepted to the National Register of Historic Places because of the significance that the Lodge and ski hill contributed to the history of Central Oregon. The Forest Service has the responsibility to manage the Lodge with the goal of preserving the historic nature and

appearance of the structure.

4.2.2 Visual

The Skyliner Lodge area is not within any FS Scenic Views management allocation although it is an important aspect of management activities. The area surrounding the Lodge has clearly been altered by human presence, and the surrounding area is a relatively young forest. There are several dirt roads and trails in the area.

4.2.3 Socio-economics

During peak times of programming (i.e. summer) Cascade Science School employs up to five full-time persons on its instructional staff, an additional two persons for kitchen/grounds needs, and up to eight counselors for camper supervision. During spring and fall, employment numbers are at roughly half of the summer figures. Winter programs at present are intermittent, with one to three staff part-time persons typically covering all staffing needs. At present there is only one year-round full time position -the site/ program coordinator.

Private residences line Skyliner Road east of CSS. The owners of these residences, which are located adjacent to both the road and the DNF, are sensitive to potential traffic and wildfire increases in the area, especially as the recreational use of the area has increased along with Bend's population. The homes are desirable because of their location near the City but next to forest. According to County tax assessors files, the property and improvement values range from well below Bend's average home price to considerably above.

4.2.4 Recreation

Skyliner Lodge, which is on the National Register of Historic Structures, was built in 1936 as the center of winter sport activities in the Tumalo drainage and used by the Skyliners Club. These activities included downhill skiing and jumping, Nordic skiing, and ice-skating. In the late 1950's, downhill skiing was moved to the newly constructed Mt. Bachelor Ski Area and use in the Tumalo Creek area diminished. For many years following this move, various groups, such as the Oregon State Grange and Pacific Crest Outward Bound, used the lodge as a center for summer activities, but often the lodge was unused. In 1993, OMSI was granted a Special Use permit to operate a school for outdoor education and use of the lodge and has been operating the facility as an organization camp since that time.

The surrounding area includes many other recreation facilities, including a trailhead just east of the permit area, mountain biking, hiking, and cross country ski trails, and the Tumalo Falls trailhead and associated trails and falls overlook. Several trailheads located on the Cascade Lakes Highway contribute trail users to this system of trails, especially mountain biking and cross country skiing. Other recreational activities in the drainage include snow shoeing, minor horse use, and a small amount of snowmobile use. Overall, it is estimated that recreation use is increasing by 10 to 20% per year.

An older, existing trail, known as the Loop Trail, parallels the entrance road into the lodge and heads west into the Bridge Creek burn area. Another recently constructed trail runs on the south side of the permit area. This trail was constructed to move use out of the center of the permit area to reduce impacts with the outdoor school children and activities on the permit area. The Loop Trail continues to receive some use, especially during winter, as a cross country ski trail.

As the intent of having an outdoor school located at Skyliner Lodge is to teach school-age children environmental-related subjects, another connected use is guided trips by OMSI in the Tumalo drainage and other areas of the DNF, as part of the education process. A large percentage of class time is spent either in the lodge or yurts or in the surrounding area, however, other uses include hiking, caving, and canoeing at various locations on the Forest. This guided use is measured by user days. A user day is a day or any part of a day that one person has use on National Forest land. The school currently has a separate Special Use permit for this guiding and the permit allows for 3,138 user days. The majority of the use occurs during the period from late spring to early fall.

CSS currently conducts classes that use the existing permit area for field trips and natural history study, with a maximum of 64 students per day. Off the campus in non-wilderness areas, instructional groups typically consist of 10-15 students and two to three instructors/chaperones/counselors. In wilderness areas, hiking groups do not exceed 12 persons: ten students, one instructor, and one college counselor.

4.2.5 Wildfire Hazard

Routine maintenance to reduce wildfire hazard has been conducted by CSS staff since 1993, coordinated with DNF. This maintenance includes the collection and removal of dead-fall timber to reduce the fire fuel-loads.

The south side of camp, in the area of the boys and staff cabins, is a denser forest tract. In the summer of 2000, in accordance with the Special Use permit, CSS staff collected large quantities of downed timber to be converted to wood chips for dust control on-site. The goal is to establish a fuel reduction program, integrated with other resource needs such as wildlife and scenery, jointly with the City of Bend Fire Department and DNF that can be monitored and maintained annually. CSS has also installed an emergency fire sprinkling system in the historic Skyliner Lodge.

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CHAPTER 5: ENVIRONMENTAL CONSEQUENCES

5.1 NATURAL SETTING

5.1.1 Wildlife and Fish Species

5.1.1.1 *Forest Service Management Indicator Species*

Alternative 1 would have no impact on any wildlife species or wildlife habitat. Upon implementation of alternatives 2 or 3, construction proposed by the CSS Master Plan would cause short-term noise disturbance and wildlife currently using the area may avoid it during those periods. Effects would be minimal because the project is of limited scope and would occur entirely within a previously used area. There would be no adverse effects to any wildlife species or their habitat.

No direct, indirect, or cumulative adverse effects were identified.

5.1.1.2 *Proposed, Endangered, Threatened, Sensitive (Pets), & Candidate Species*

The DNF wildlife biologist determined that The OMSI Science School Master Development Plan Project is consistent with the 2000 Joint Aquatic and Terrestrial Programmatic BA Project Design Criteria for the Canadian lynx. Neither Alternative 2 or 3 would affect existing habitat quality for lynx within the project area or affect the potential of the area to provide future lynx habitat.

No direct, indirect, or cumulative adverse effects were identified.

5.1.1.3 *Fisheries*

Implementation of the CSS Master Plan would mean that the existing septic system would be replaced. Although there are no existing water quality problems, the existing waste disposal system (pit toilets), poses more potential long-term risk to water quality, and therefore fish habitat, than a modern septic

system.

No direct, indirect, or cumulative adverse effects from Alternatives 2 or 3 were identified.

5.1.2 Vegetation

5.1.2.1 *Threatened, Endangered, & Sensitive Plants*

If noxious weeds become established in the project area as a result of ground disturbance, they could lead to a cumulative loss of potential habitat for the green-tinged paintbrush or Newberry's gentian in the watershed. Alternative 3 would pose a slightly greater risk of weed introduction and enhancement due to the greater area of ground disturbance for the dining hall. A continuation of CSS's current weed mitigation efforts (see Section 5.1.2.3) will reduce this risk.

There are no expected direct or indirect effects to TES plants or their habitats from implementation of this project.

If weed mitigation is followed, there are no expected cumulative impacts to TES plants or their potential habitat (see Weed Mitigation, Section 5.1.2.3).

5.1.2.2 *Survey and Manage Plants & Fungi*

There are no expected effects to potential habitat for the liverwort (Ptilidium californicum), a Survey and Manage plant species, because it is generally associated with large old growth white fir, which is not present within the project boundaries and occurs only on the outer fringes of the project area.

5.1.2.3 *Noxious Weeds And Exotic Plants*

Under any of the alternatives, noxious weed control would continue within the CSS area.

Alternatives 2 and 3 include the disturbance of ground for installation of the water and septic systems, as well as foundations for new buildings. Any disturbed areas would be closely monitored for the appearance of noxious weeds, which would be promptly removed. Revegetation with native plant materials would be implemented where appropriate.

5.1.3 Wetlands

None of the alternatives would affect wetland. No wetlands are located within the permit boundaries, and the proposed activities in Alternatives 1, 2, and 3 are compliant with the orders and USDA Departmental Regulation 9500-3. No direct, indirect, or cumulative effects from any of the Alternatives were identified.

5.1.4 Riparian Resources

Under any of the alternatives, the riparian vegetation that exists outside the permit area along Tumalo Creek, side drainage, and wet area, would continue to be protected. No direct, indirect, or cumulative effects from any of the Alternatives were identified.

5.1.5 Forest Resources

Alternatives 2 and would result in the removal of approximately 1.15 acres of small, second growth timber for the septic drain field and installation of the new water line. Alternative 2 would include the installation of an improved water delivery system, which could potentially decrease wildfire risks.

Alternative 3 would have similar impacts to Alternative 2, with the additional removal of 5,000 square feet of second growth forest for the construction of the dining hall/classroom building.

No adverse direct, indirect, or cumulative effects from any of the Alternatives were identified.

5.1.6 Aquatic Conservation Strategy

The Aquatic Conservation Strategy (ACS) section will discuss how each alternative either meets or does not meet the intent of the Northwest Forest Plan Aquatic Conservation Strategy Objectives.

ACS Objective 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted (USDA, Forest Service, Northwest Forest Plan, 1995).

Alternative 1

The No Action Alternative meets the intent of objective 1, yet poses a threat to the distribution, diversity and complexity of watershed and landscape-scale features. The 1930s-era septic system, which drains to an unknown location, along with the pit toilets, represent the potential for a water quality crisis. Combined, the present waste water system endangers the aquatic systems to which species, populations, and communities are uniquely adapted.

Alternatives 2 and 3

The OMSI Expansion Project will have no measurable adverse effects to the system at the watershed scale. On a watershed and landscape scale, both alternatives are consistent with the ACS Objective 1.

ACS Objective 2: Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands,

upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Alternatives 1, 2, and 3

All three alternatives will maintain the current connectivity within and between watersheds. No species would be obstructed from critical habitat by changes in connectivity. All three alternatives meet the intent of ACS Objective 2.

ACS Objective 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Alternative 1, 2, and 3

All three alternatives will maintain the physical integrity of the aquatic system, meeting the intent of ACS Objective 3. No measurable adverse affects are foreseen from the expansion project.

ACS Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Alternative 1

The No Action Alternative meets Objective 4, yet has potential to have adverse affects on water quality over time. The sub-standard septic system drains to an unknown location and is over 60 years old. Other alternatives would reduce the possibility for a water quality crisis.

Alternatives 2 and 3

Alternatives 2 and 3 will minimize the possibility of water quality crisis by replacing the old septic system with a DEQ approved design that incorporates a known drain field location. Alternatives 2 and 3 will meet the intent of ACS Objective 4.

ACS Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Alternatives 1, 2, and 3

All three alternatives will have no measurable impacts on the sediment regime under which aquatic ecosystems evolved. The action alternatives implement the re-establishment of desirable vegetation on bare ground to maintain the current sediment regime.

ACS Objective 6: Maintain and restore in-stream flows sufficient to create and restore riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration and spatial distribution of peak, high, and low flows must be protected.

Alternatives 1, 2, and 3

Alternatives 1, 2, and 3 will have no measurable adverse effects on in-stream flows. All three alternatives meet the intent of ACS Objective 6.

ACS Objective 7: Maintain and restore timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands.

Alternatives 1, 2, and 3

The alternatives will have no measurable adverse effects on the timing, variability, and duration of flood plain inundation and water table elevation in meadows and wetlands. All alternatives meet ACS Objective 7.

ACS Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.

Alternatives 1, 2, and 3

The alternatives will maintain species composition and structural diversity of plant communities. The intent of ACS Objective 8 will be met.

ACS Objective 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Alternatives 1, 2, and 3

Alternatives 1, 2, and 3 will have no measurable adverse effects on habitat for native plants, invertebrates, and vertebrate riparian-dependent species. For alternatives 2 and 3, mitigation measures will re-establish desirable vegetation and control against weed infestations. The alternatives will meet the intent of ACS Objective 9.

5.1.7 Air Quality

Construction or operation of the proposed CSS Master Plan is not expected to adversely affect air quality. Some dust associated with construction activities would be considered short-term. Slash and cleared vegetation would either be chipped and utilized on site, or removed to another site where it would be disposed under air quality guidelines implemented by the State of Oregon.

No indirect, or cumulative effects from any of the Alternatives were identified.

5.1.8 Noise

There will be some short-term noise impacts from construction of either Alternative 2 or 3. This will be additional to temporary construction noise in the area from planned DNF projects to improve the Tumalo Falls parking, bridge, and access road, but will occur in short time periods over the next 10 years.

Long-term, year-round operation of CSS under Alternatives 2 or 3 would result in an increase in bus traffic to Skyliner Lodge compared to the current amount but the increase would be spread over the year. No increase in daily bus traffic would occur from either Alternative 2 or 3. Some traffic, such as trips into Bend for showers would be eliminated. Overall the traffic would have a minor contribution to overall background noise along Skyliner Road.

No indirect effects from any of the Alternatives were identified.

5.1.9 Land Use

There are no lands within the project area that are classified as prime timber, farm or rangelands. Proposed activities in Alternatives 2 and 3 would not change areas classified as prime forestland. There would be no direct, indirect, or cumulative adverse effect to these resources and thus are in compliance with the Farmland Protection Act and Departmental Regulation 9500-3, 'Land Use Policy'.

5.2 CULTURAL SETTING

5.2.1 Archeological and Historical

Under any of the three alternatives, any work on the historic Skyliner Lodge will be coordinated with DNF archeologists and will be compatible with the historic nature of the Lodge.

Under Alternatives 1 and 2, Skyliner Lodge would continue to be used as a dining hall, with the associated potential for long-term wear on the structure. Under Alternative 3, a new dining room would remove that use from the Lodge and remove the potential for that impact.

Under Alternatives 1 and 2, the two yurts and A-frame cabins would remain. These structures are not architecturally or aesthetically compatible with the Lodge. Alternative 3 would replace the A-frame cabins with structures that are more compatible with the architecture of the lodge.

No cumulative effects from any of the Alternatives were identified.

5.2.2 Visual

Visual impacts from the proposed project will consist of a new dining hall, student and staff cabins, a new septic system, and two new above-ground water tanks. The water tanks will not be visible from Skyliner Road. The tanks will be 24 feet tall and will be painted dark green. The paint is non-reflective and will blend into the background trees. Construction access will be along existing roads, which will be rehabilitated by replacement of organic materials following installation of the tanks to prevent erosion. Small check dams may be installed, if necessary.

5.2.3 Socio-economics

Under Alternatives 2 or 3, year-round programs would result in the creation of several additional staffing jobs. Alternative 1 would not result in any additional jobs.

General property values of private residences along Skyliner Road would not be adversely impacted by either Alternative 2 or 3, since the amount of daily traffic would not increase substantially from the present less than one daily bus trips and vehicles driven by non-resident staff. During the winter months, when Skyliner Road is typically quieter than during the summer, these bus trips may be more obvious to local residents. Other impacts to property values, such as possible increases in wildfire hazard, would be decreased by the improved fire suppression water delivery system.

No indirect, or cumulative effects from any of the Alternatives were identified.

5.2.4 Recreation

The no action alternative would not make any changes to the existing condition of the lodge or permit area. There are two limiting factors on growth of the recreational use associated with the school. These are the condition of the overnight facilities and the restroom conditions. Although the 1960's vintage sleeping quarters have been replaced with insulated A-frame cabins, which would be used in the colder months, the restroom facilities continue to be outhouses, which are unacceptable for use by school-age children during these months. No increase in use is expected in these programs so effects associated with OMSI's use would not change. Public use is expected to increase on the trails, trailheads, and Tumalo Falls area due to the growth of Bend and increasing visitor use.

Alternative 2 would allow OMSI to construct restroom/shower facilities to replace the existing

outhouses and complete the installation of the A-frame cabins with electric wiring for lights and heat. This would allow OMSI to conduct overnight programs into the fall though early spring seasons. The total number of students using the lodge and the surrounding Forest will increase over time as the program is built up, however, the actual numbers at any one time will not increase. The amount of overnight accommodations will not increase so use numbers will not change during the summer months. The public use during the late fall to early spring season is lower than during the summer months, with the largest numbers involved with cross country skiing and snow-shoeing as snow conditions allow. OMSI's guided use would contribute some additional user numbers to this public use, mainly during the week days as these programs are associated with schools and are expected to be generally Monday through Friday. The actually numbers and locations of these impacts are unknown at this time because OMSI has very limited use during the fall to early spring seasons at this time. Any new locations that are proposed for guided use would have to be evaluated when they are proposed in annual operating plans. Wilderness use numbers are already established and will not be increased. High use areas will generally be discouraged. Increased use of the Tumalo creek area is expected as this area is readily accessible from the lodge and has many resources that lend themselves to the subjects taught by OMSI.

Public use of the Tumalo creek area during these seasons is expected to continue to increase over time, but the limiting factor is the snow conditions and available parking. Public encounters with school classes have the potential for increasing with this alternative within this time period as compared with the current condition.

There is little expected difference in impacts to recreation between Alternatives 2 and 3. The only change would be that users on the trail through the camp would pass by the new dining hall. The access road for trucks to deliver food supplies to the kitchen would cross this trail and would be plowed of snow possibly leaving a berm that will have to be negotiated.

5.2.5 Wildfire Hazard

There would be no increase in daily numbers of students with any of the alternatives. Under Alternative 2 or 3, the school's season would be extended to year-round. Students would be present during the winter months; however, this is the period of lowest fire danger. Since 1993, student numbers during the summer months has been increasing to their present level, while at the same time the fuel loading on the permit area has been reduced. There have been no instances of student-caused fires during the entire time of occupancy and use of the lodge.

Implementation of the CSS Master Plan in either Alternative 2 or 3 would reduce overall fire hazard in the area because of the improved water delivery system.

Under any alternative, CSS will continue to coordinate with DNF on their fuels reduction program.

No indirect effects from any of the Alternatives were identified.

5.2.6 Land Use

There are no lands within the project area that are classified as prime timber, farm or rangelands. Proposed activities in Alternatives 2 and 3 would not change areas classified as prime forestland. There would be no direct, indirect, or cumulative adverse effect to these resources and thus the project would be in compliance with the Farmland Protection Act and Departmental Regulation 9500-3, "Land Use Policy'.

5.3 CIVIL RIGHTS AND ENVIRONMENTAL JUSTICE

Civil Rights legislation and Executive Order 12898 (Environmental Justice) directs an analysis of the proposed alternatives as they relate to specific subsets of the American population, including ethnic minorities, disabled people, and low-income groups. The analysis is to determine whether adverse civil rights impacts are anticipated on an underrepresented population, and also whether disproportionate impacts associated with the alternatives are anticipated.

Implementation of the CSS Master Plan as configured by either Alternative 2 or 3 would not have a disproportionately adverse affect on individuals in any subset of the general population. Expansion of the CSS facilities may have a beneficial effect on children in low-income groups, because the OMSI program would be available to more students, many of whom are from low-income or minority neighborhoods in Oregon. OMSI Science Camps currently conduct many science and natural resource management career programs for diverse student groups, including American Indian, Native Alaskan, Hispanic, African-American, Oregon State Hospitals Adolescent Program, and numerous mixed race low income public schools. For these reasons, Alternatives 2 and 3 would not pose disproportionately high or adverse effects to minority communities or to low income groups.

5.4 IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS

There are no irreversible or irretrievable commitments of resources identified for any of the three alternatives.

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CHAPTER 6. COORDINATION AND CONSULTATION

6.1 LIST OF PREPARERS

Deschutes National Forest

- Shelley Borchert, Wildlife Biologist
- Paul Claeyssens, Archeologist
- Randy Gould, Hydrologist
- Marv Lang, Recreation Planner
- Robin Lee, Landscape Architect
- James C. Lowrie, Supervisory Wildlife Biologist
- Maret Pajutee, Ecologist/Botanist
- Robert Tanner, Hydrologist
- Rick Wesseler, Special Use Administrator

David Evans and Associates, Inc.

- Don Kliewer, PE, project engineer
- Karen Swirsky, AICP, author
- John Thompson, EIT, project technician
- Jim Henry, AIA, project architect

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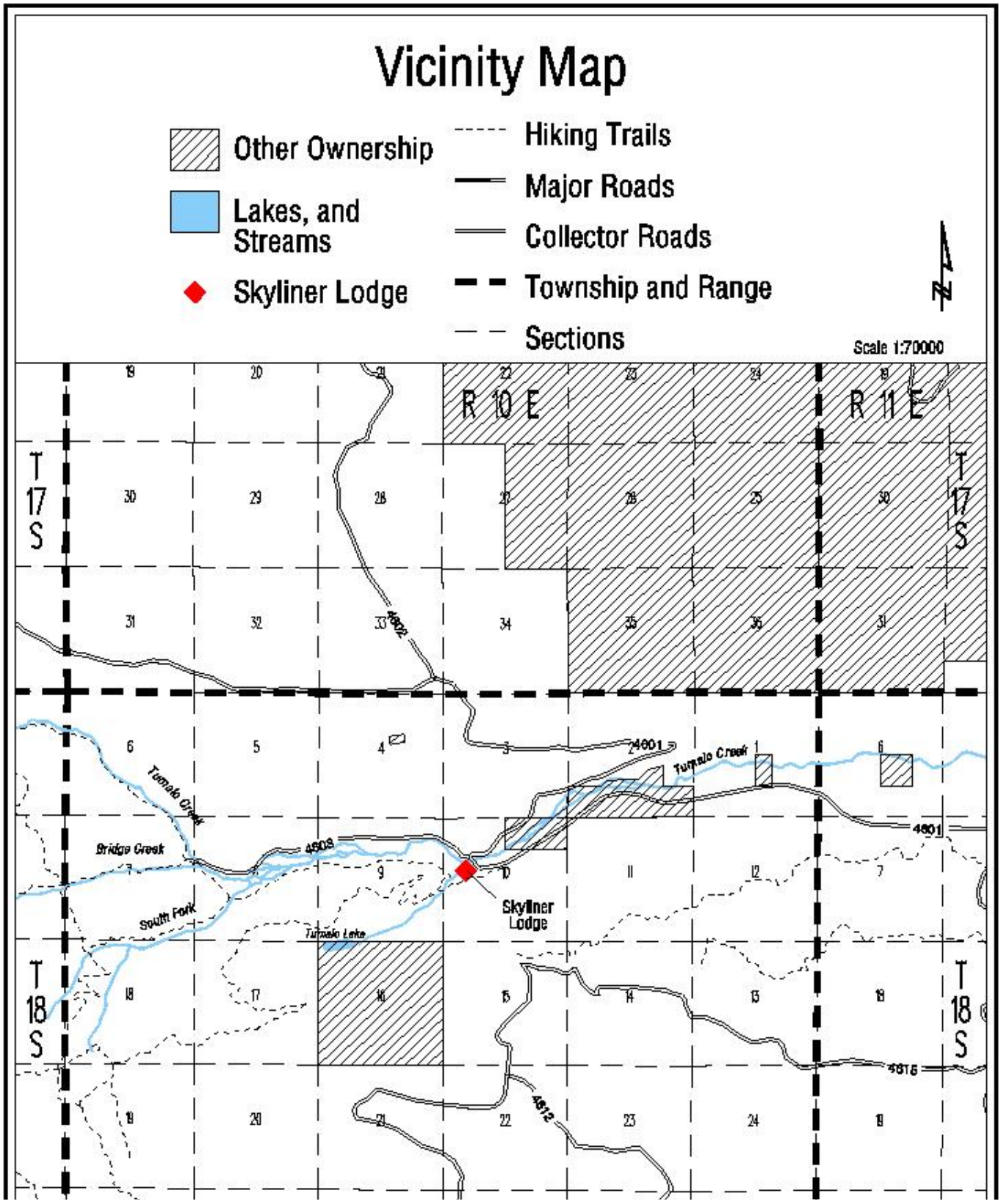

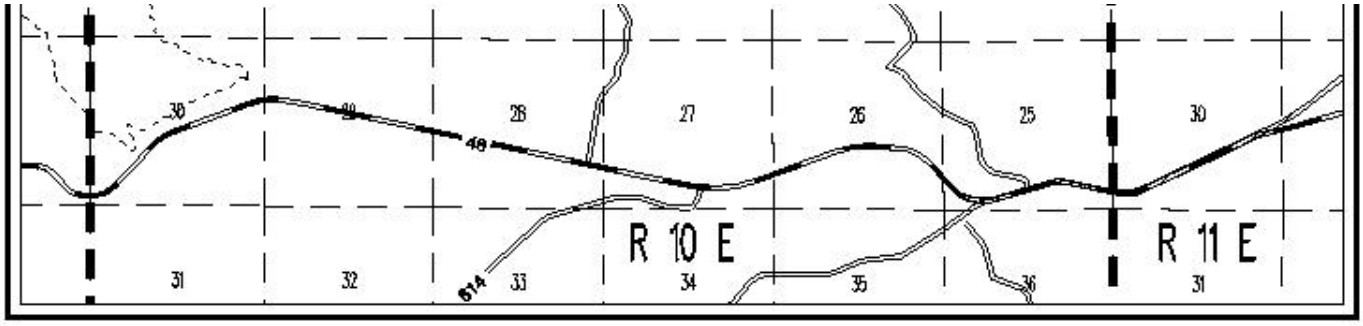

Figure 1 Vicinity Map

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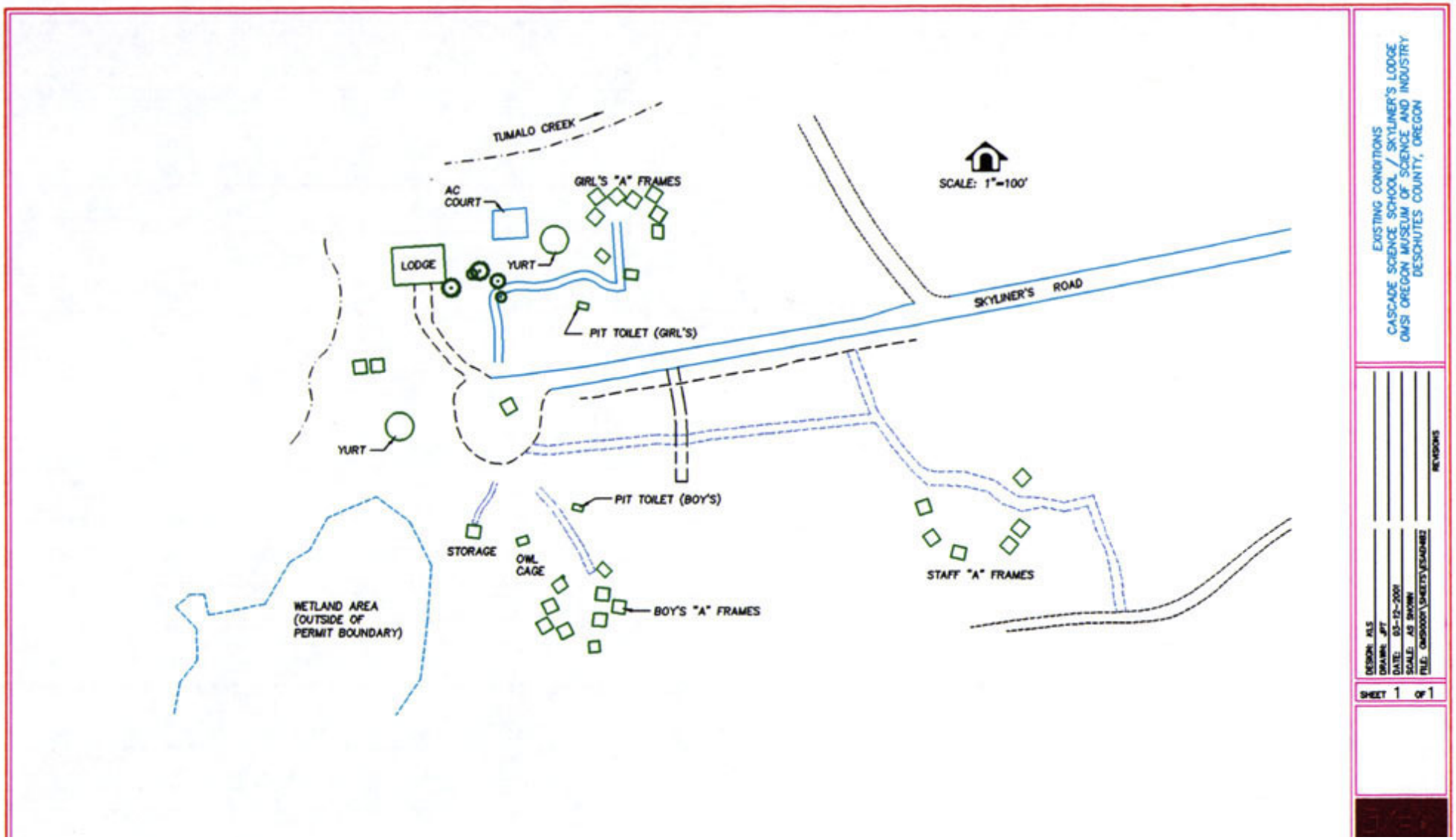

Figure 2 Existing Site Conditions

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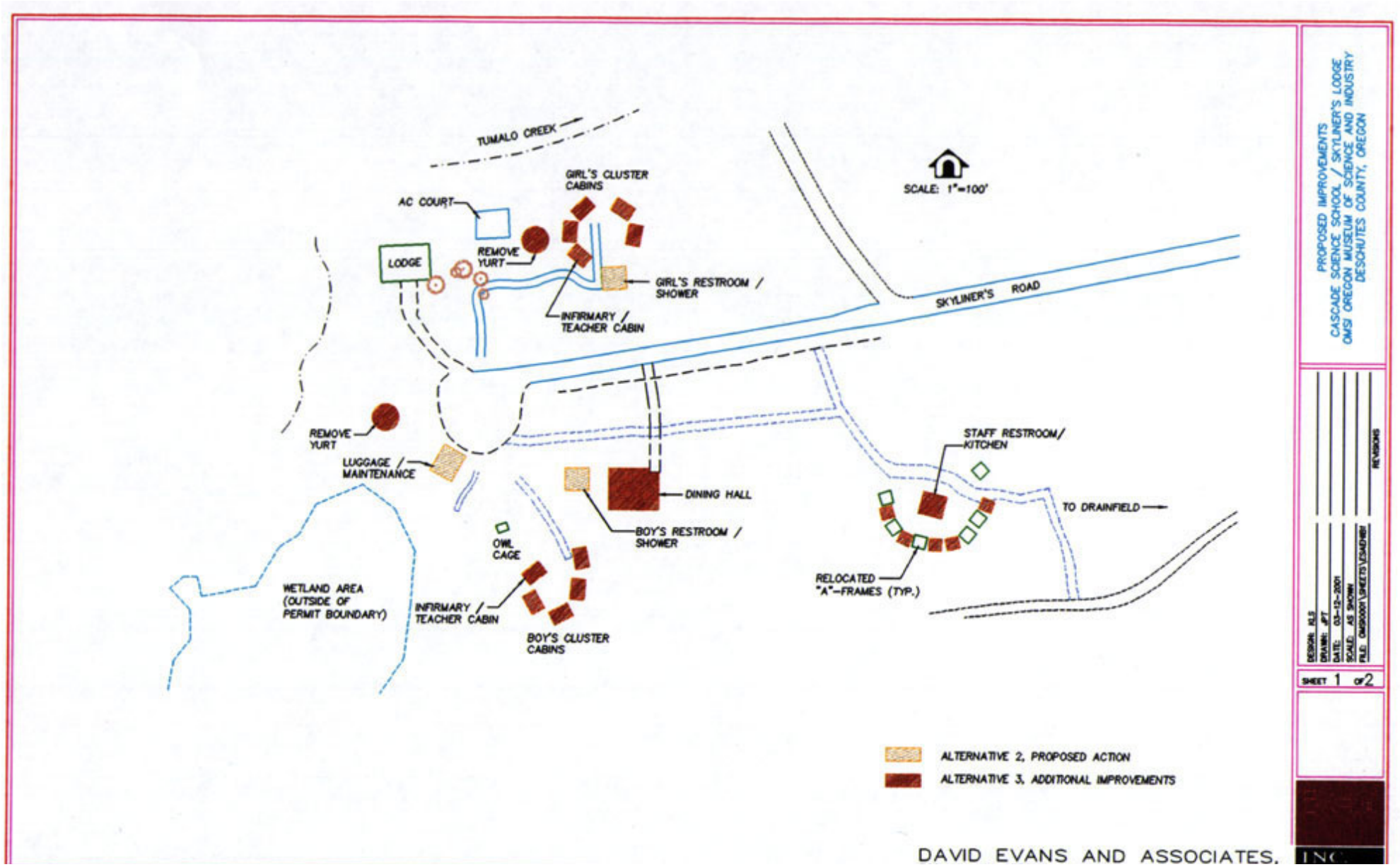

Figure 3 Alternative 2 and 3, Buildings

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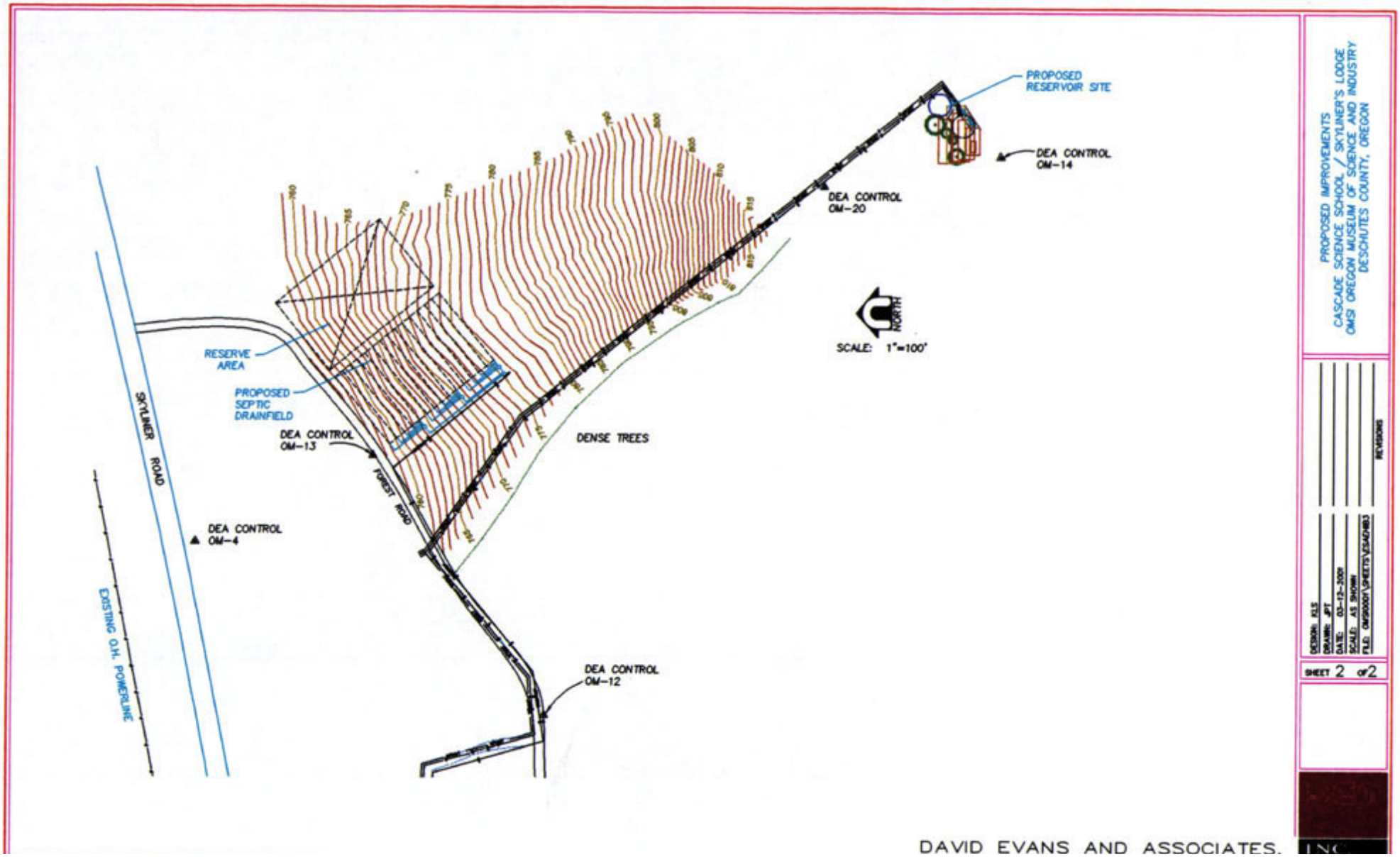

Figure 4 Alternative 2 and 3, Septic and Water System

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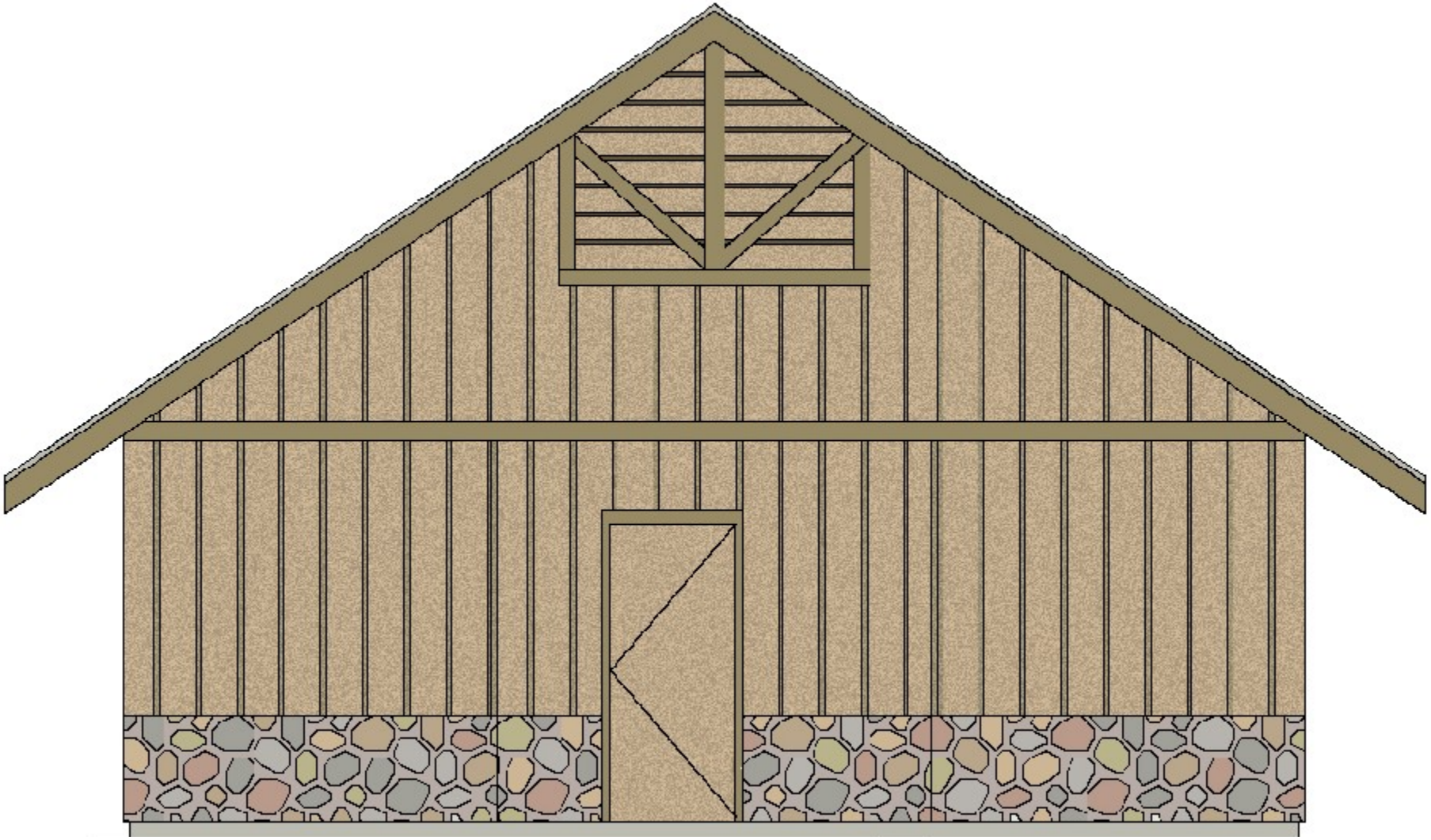

Figure 5 Restroom Elevation

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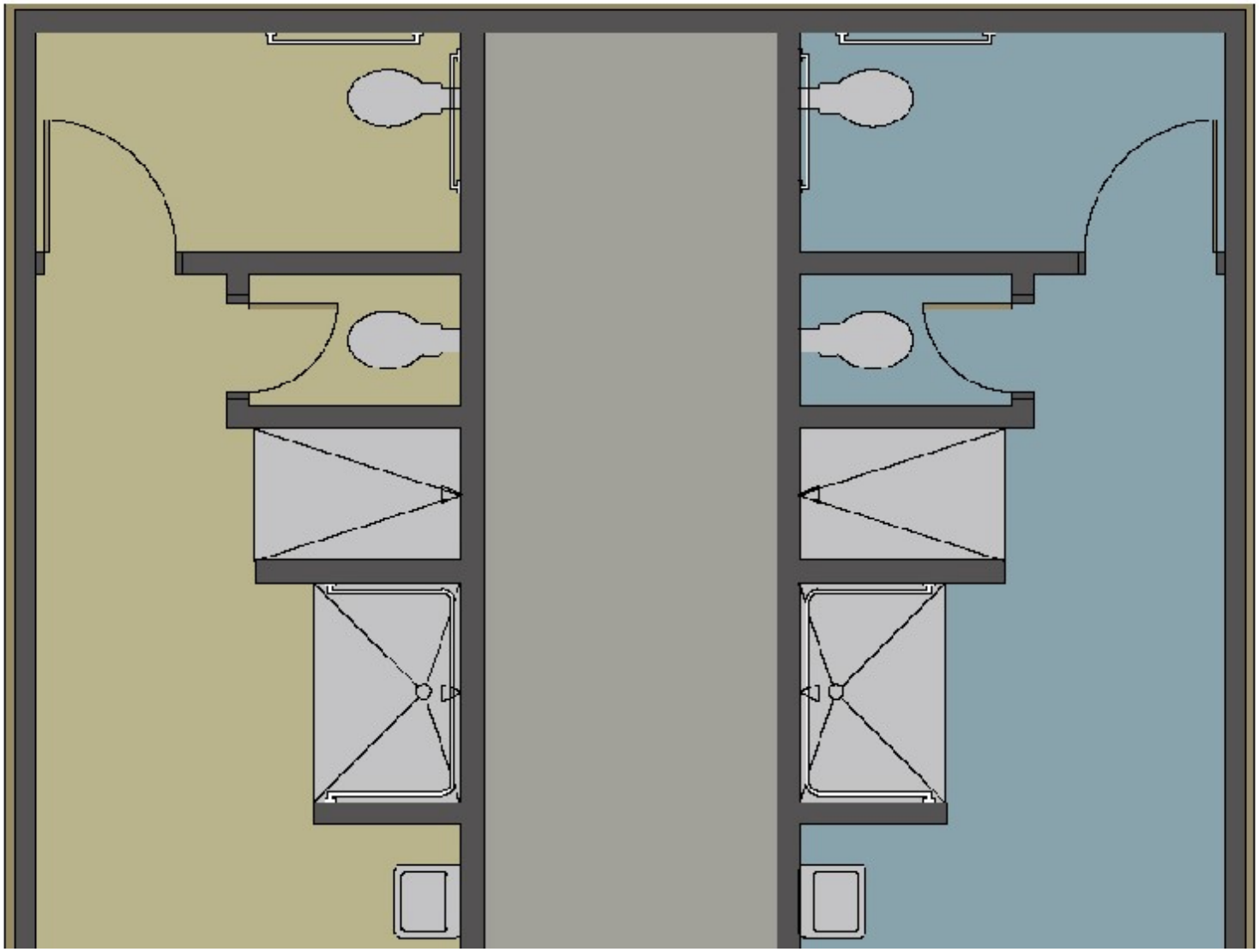

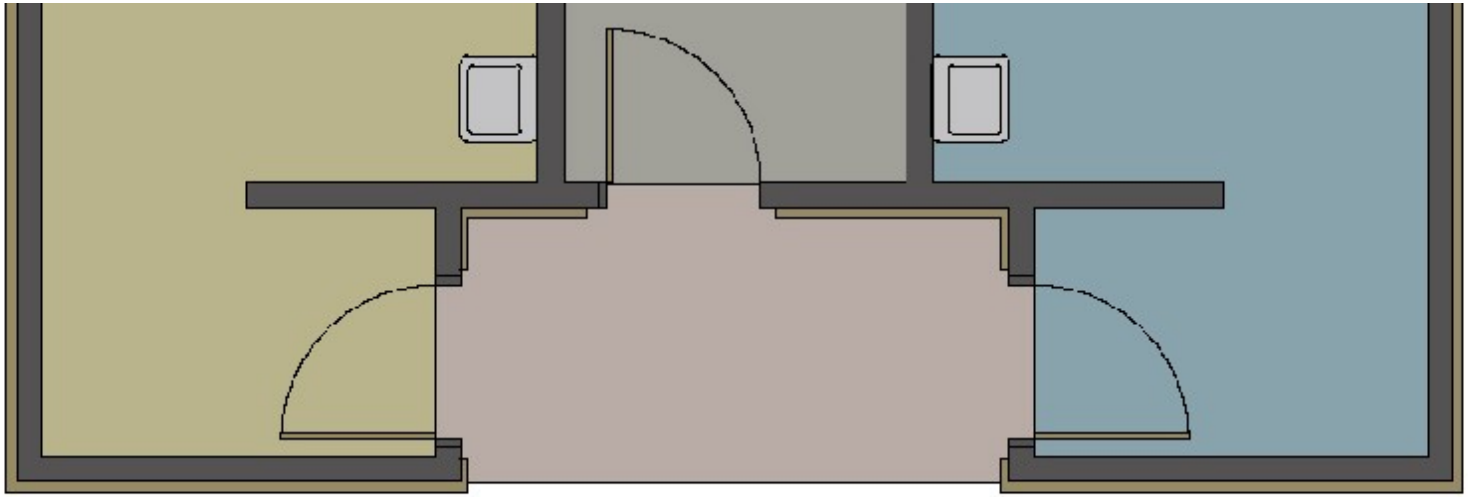

Figure 6 Restroom Floor Plan

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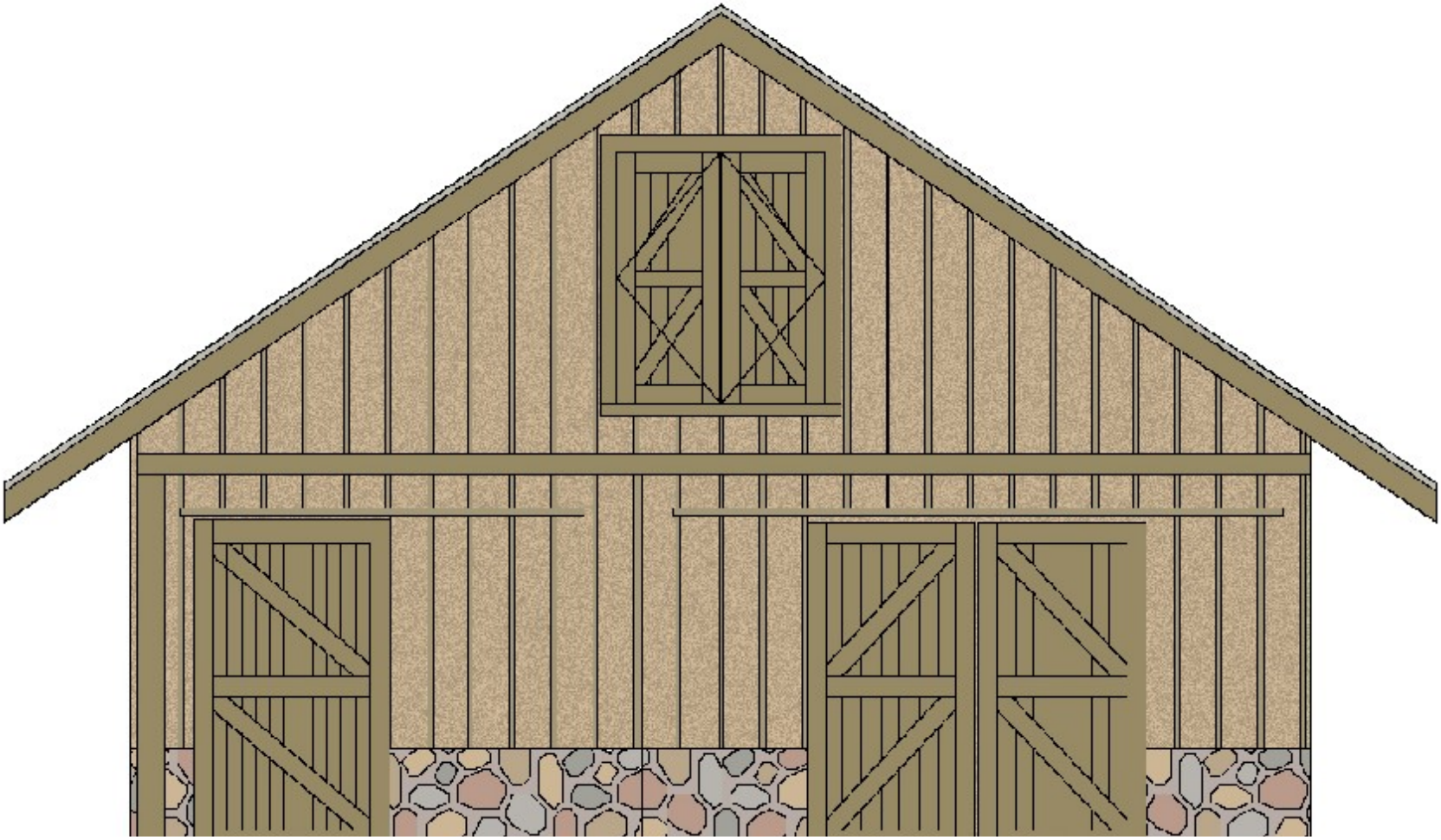

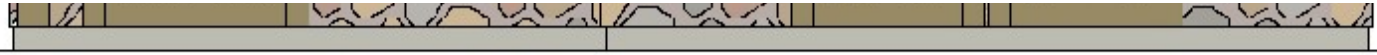

Figure 7 Supply and Storage Building

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Figure 8 Dining Room Elevation

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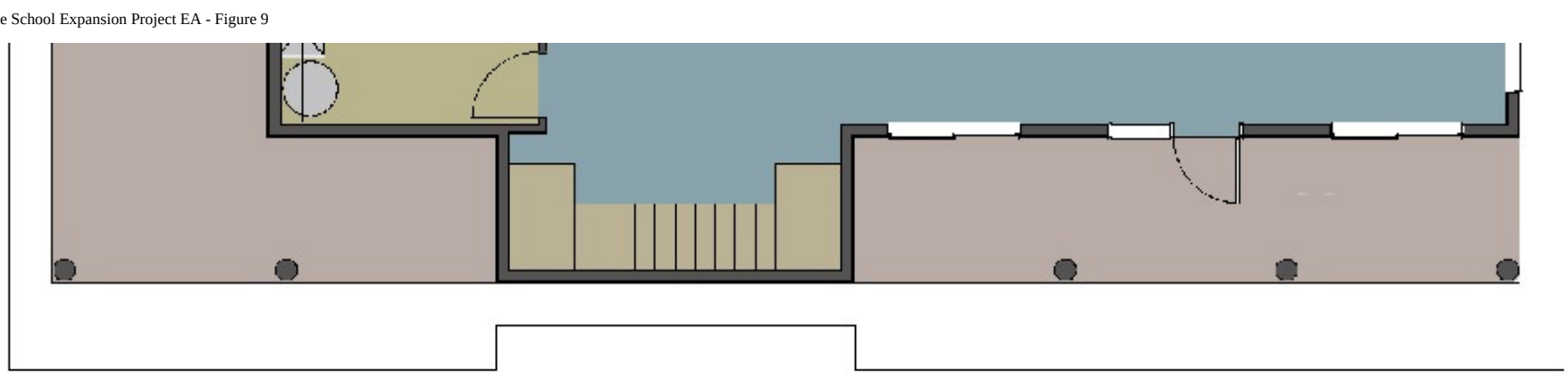

Figure 9 Dining Room Floor Plan

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