3.2 Capital Projects

Summarized below are the needed facility and infrastructure projects for the next five and ten year periods followed by a description/justification for each project. Total project budgets include design fees, construction costs, and equipment purchase in 2012 dollars.

TABLE 3.1 Capital Project Budgets*

(P)-Planning; (C)-Construction; (E)-Equipment; (AP)-Land Acquisition;

Project	5 Year Program	Post 5 Year Program	Total Project Budget
Building Addition		$3,243,000 (P) $25,682,000 (C) $3,000,000 (E)	$31,925,000
Field Laboratories		$500,000 (A) $407,000 (P) $3,476,000 (C) $550,000 (E)	$4,933,000
Total:			$36,858,000

* Information for Table 3.1 was obtained from UMCES Capital Budget Information System (C.B.I.S 2012).

1. Building Addition

Land acquisition is not necessary for the addition to the existing main building. The preferred solution is the construction of a 16,390 NASF, two-story addition to the current facility. Given the current dissatisfactory condition of the greenhouse, its replacement on top of the addition would be the most efficient solution. This would provide the necessary research, educational, lecture, and outreach areas to support ever-increasing activities at the lab. The new addition should complement the existing facility's design and construction materials.

The construction of a gabled all steel rectangular pavilion approximately 16' x 24' installed on new concrete pad with reliable power and lighting would also facilitate instructional, outreach workshop and group projects and graduate student activities as an outdoor, protected classroom.

As Frostburg is an old mining town, the ground beneath the addition will need to be tested and grouted to support the facility prior to construction. This results in higher building costs for site preparation.

Suggested program for the addition to include:

1. Molecular Ecology/Genomics Facility
    - State-of-the-art molecular genetics lab
    - Shared centralized “core” lab space used by multiple PIs, students, postdocs, etc. designed to facilitate interaction and foster collaboration among users.
    - Separate clean room space dedicated to working with DNA from paleo-sediment cores and other environmentally degraded samples
2. Field Staging/Prep – improving the interface between the field and the lab
    - Sample processing labs
    - Field Equipment Storage
    - Improved vehicle loading/unloading access
    - Field Equipment Construction/Maintenance Areas
3. Computing
    - High Performance Computing Facility
4. Meeting and Gathering Space
    - Additional IVN and/or classroom space
    - Meeting area(s) for small group discussion
    - Kitchen/faculty break room
    - Showers/locker rooms

5. Environmental Education/Outreach Facilities
    - Multipurpose classroom(s) suitable to environmental education and workshops
    - One or more educational labs
    - Outdoor classroom/pavilion
6. Additional office space for faculty, students, RA's, and post-docs
7. Research greenhouse facility for multiple researchers

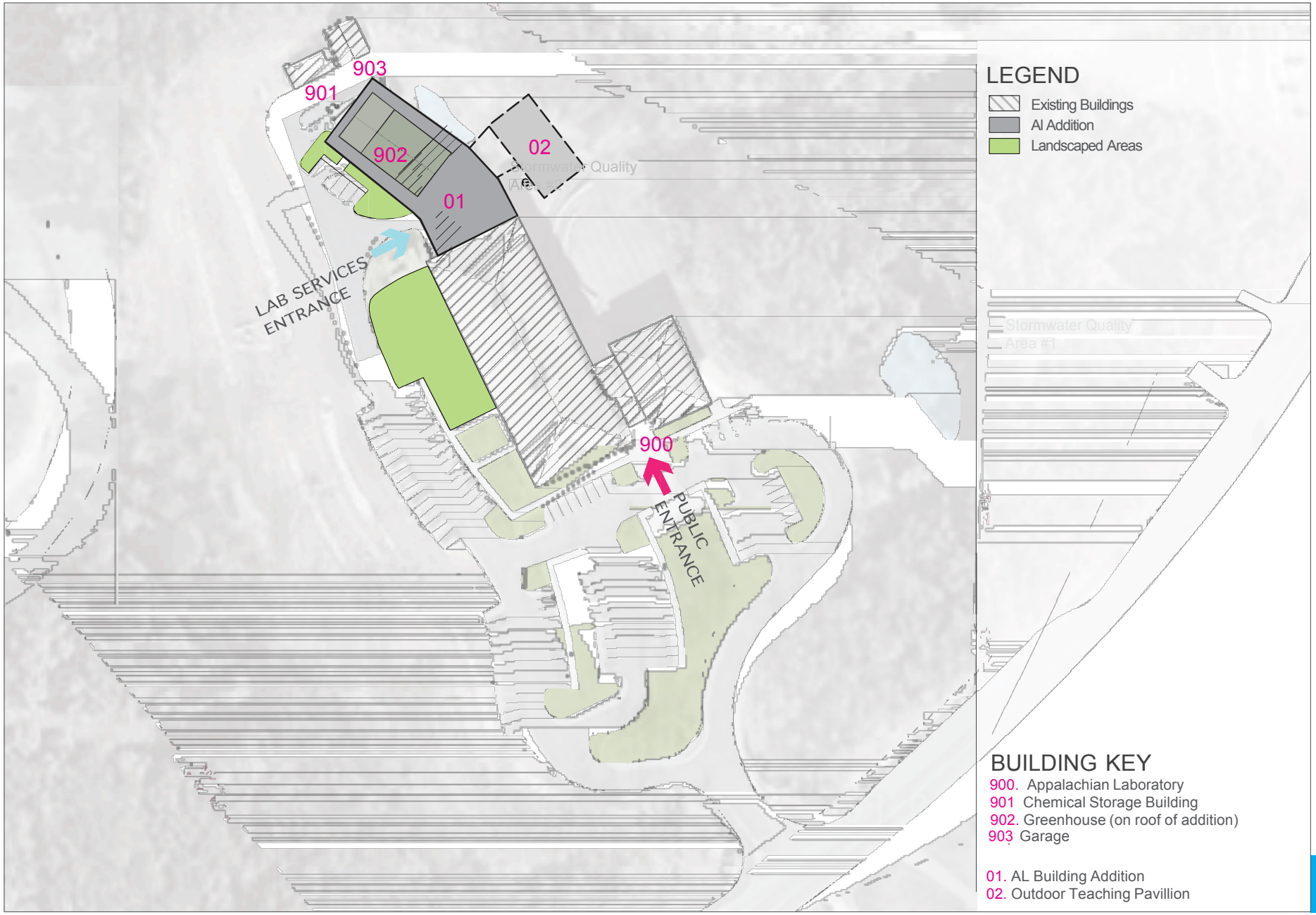
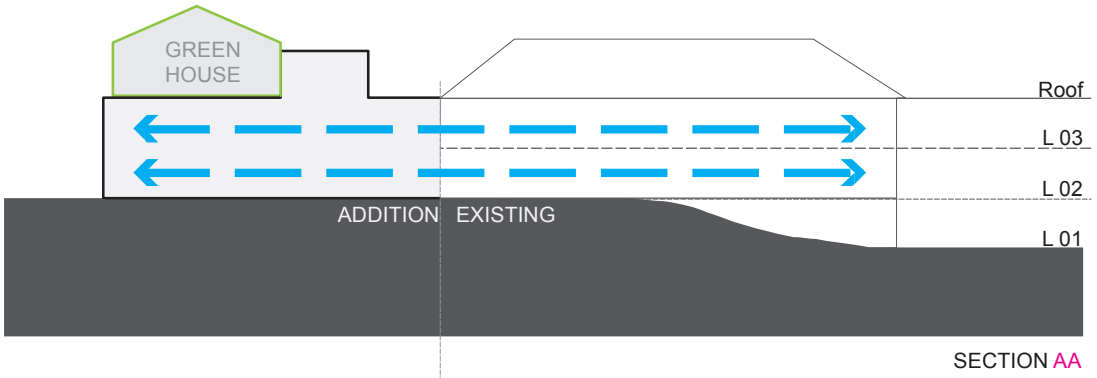
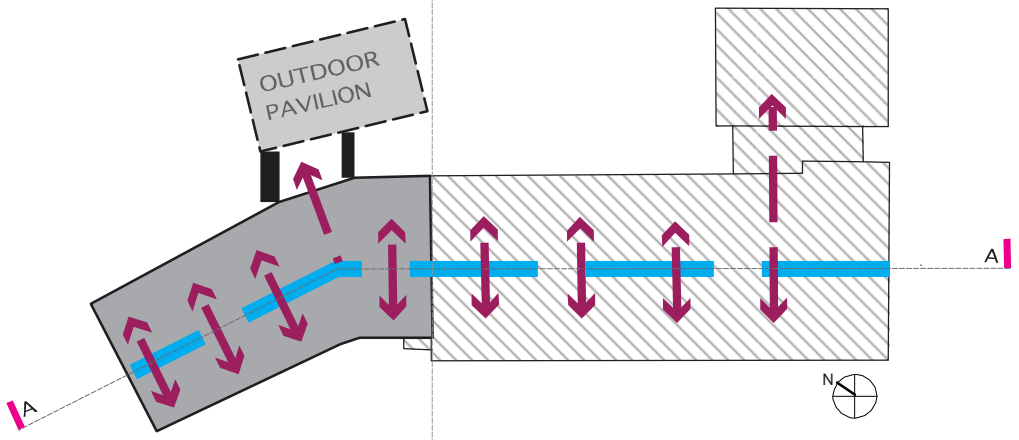


Illustration 3.1
AL Building Addition



SECTION AA



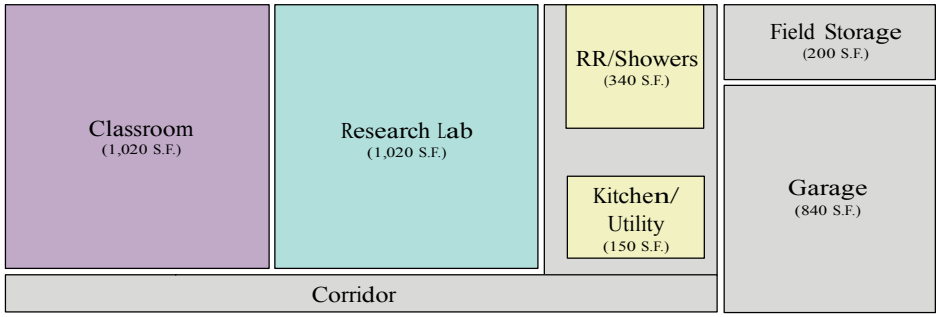
LEGEND

- Existing Buildings
- Al Addition
- Primary Circulation
- Secondary Circulation

Illustration 3.2
AL Building Addition - Circulation Diagrams

0 100' 200' NORTH

2. Western MD Field Research Station



< 3,500 NSF building to accommodate:

- Monitoring equipment
- Laboratory facilities
- Equipment storage
- Field prep and staging areas
- Educational/classroom space
- Kitchen, showers, locker rooms

Illustration 3.3 - Example Field Research Station Plan Diagram

Intensive experimental research on the effects of land disturbances, land use conversions, climate change and other activities on terrestrial and freshwater ecosystems is usually conducted within small, protected (i.e. secure), instrumented watersheds where both short-term and long-term ecosystem studies can be conducted. Currently, Appalachian Lab research in this area is hampered by the lack of an available watershed research station in western Maryland. The construction of a watershed research station on Maryland State Forest land would be used to support such research activities.

The scope of this project includes a facility approximately 3,500 NSF. The construction should be a durable, secure facility with reliable power and utilities. Internal partitions in lieu of permanent walls will allow for changes as research needs change. The facility should be built to also allow for future expansion as the research needs increase. The field station should include a permanent stream discharge gauging and water sampling station constructed on nearby watershed, experimental stream channels designed to simulate characteristics of real stream channels, and a meteorological station.

Construction of these facilities will further UMCES Appalachian Laboratory's sustainability efforts and support AL's commitment to reducing carbon emissions by clustering field research activities. The field stations will minimize the commute time by research staff, faculty and students by providing on-site resources that currently require travel back and forth from the lab to the field.

The station will allow for collection and analysis of data as well as provide an on-site facility for personnel that will be housed there. Additionally, depending on the selection and availability of the site location, the construction will incorporate compatible materials and equipment that will minimize the station's climate impact. AL will seek to make the new buildings, structures and additions as carbon and energy neutral as possible by providing renewable energy systems as an integral part of the design and relying upon as few utilities and outside services as possible. Some possible systems to help achieve this include composting toilets, cisterns to collect rainwater for laundry and cleaning, and renewable energy systems; such as photovoltaic panels, solar hot water panels and small scale wind power.