

HH ARCHITECTURE



Orange County Environment and Agricultural Center Preliminary Study

Orange County Asset Management Services

HH Architecture
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Executive Summary

HH Architecture was commissioned by Orange County to conduct a preliminary study to assess options for renovation or replacement of the existing Orange County Environment and Agricultural Center (EAC). The EAC currently operates out of a repurposed retail building that was originally built as a Carr's Supermarket in 1960. Since its acquisition and conversion in the late 1980s, the facility has housed several County, State and Federal agencies with a focus on supporting the local agricultural community.

While the facility's location on the periphery of Hillsborough is desirable, the facility has never been efficient in its construction, operation, and space utilization for the services it delivers. The County has conducted a physical assessment and considered relocation of the EAC to an alternate site in past master plans and studies. The purpose of this preliminary study is to evaluate options for the EAC on its current site. At the conclusion of the study, the Board of County Commissioners will discuss the options and may make a decision as to which option to pursue.

Background

A 2013 study was commissioned to analyze a relocation to the Government Services Annex facility. However, the plan was ultimately rejected due to the lack of adequate vehicle access, and the conclusion that the customer base was satisfied with the Revere Road location and its ability to provide excellent services to the agricultural community. A follow-up physical assessment analysis of County facilities determined that the EAC facility was structurally sound; however, the report concluded that the facility is functionally obsolete and could benefit from a major renovation or replacement to better serve customers and employees.

Feedback and Analysis

This preliminary study continues where the physical assessment study left off, with the exploration of options to renovate or replace the EAC. Vision planning and stakeholder input sessions were conducted at the outset of the project, where the Design Team reviewed past building reports, performed existing facility and site analysis, and met extensively with County Commissioners, staff, and project stakeholders, including department employees and leadership.

During the staff and stakeholder input sessions, the overall project goals and County objectives were identified, and the department space needs were discussed. The core objectives of the project include increasing access to public services, improving the workflow and interior layout for better customer service, improving administrative workspaces, and demonstrating continued County leadership in sustainability and design. The new facilities will be designed to meet current energy code standards, and enhanced sustainability and energy-efficient design components will be considered as the project progresses and as the budget sustains them. Items discussed include geothermal systems, photovoltaic arrays, water reclamation systems, demonstration rain gardens, and electric vehicle charging stations.

The stakeholder input sessions identified a wide range of current issues as well as important considerations for the new design. Poor HVAC system performance, moisture intrusion, limited daylighting, and inadequate meeting and demonstration spaces were cited as key deficiencies with the current facilities. Extensive meeting and conferencing needs were identified for incorporation into the new facilities. Staff also cited a widespread need for private space to conduct client meetings, hold phone calls, and to secure files and equipment. Discussions of open office design considerations were led by the Design Team at these meetings. The overall trend in the public sector, including Federal, state, and municipal facilities, has continued to move in this direction to save on cost and real estate needs. Open office cost considerations are included in this report for further discussion.

Study Options

The results of these initial planning and input sessions formed the basis of the following three development options that are considered in this study, and these options represent distinct direction for the continuation of the design.

The opinion of probable cost for each option is based on 2017 cost data. Due to the recent and anticipated rise in construction material and labor costs, as well as the length of time before construction on this project begins, the Design Team recommends adding a 6% escalation factor to the EAC project budget.

Option 1: Major Renovation

\$3,475,297 (\$3,415,458 with open office layout)

The existing building shell remains in place with a major 'gut' renovation to improve layout, customer service, and workflow. The exterior envelope receives energy retrofit upgrades, including continuous wall insulation as well as roof insulation. It is anticipated that no major site work changes will be required. Parking and demonstration areas would be repaired and improved.

Option 2A: New Pre-engineered Construction

\$3,950,513 (\$3,903,420 with open office layout)

This option entails a complete deconstruction and replacement of the existing building. A newly constructed smaller building will be built to house current and projected services. The construction type proposes a combination pre-engineered structure and metal panel roofing with conventional wall cladding and interior fit out. Significant reconstruction of all non-conforming site conditions will be required.

Option 2B: New Conventional Construction

\$4,363,442 (\$4,316,350 with open office layout)

This option also includes a complete deconstruction and replacement of the existing building. A new building with a similarly sized footprint to Option 2A would be provided to house current and projected services. This option represents a conventional construction approach for a single-story steel frame building. Reconstruction of non-conforming site conditions will be required, similar to Option 2A.

Site Considerations

All three options consider retaining the facility on the current site. While the overall location proximate to Hillsborough and to roads and highways that accommodate large vehicles are beneficial for facility operations, there are other significant constraints for redevelopment of this parcel. Locations for the new building, as well as new site access driveways are limited. The irregular shape of the parcel concentrates development in a small area, leaving limited space for demonstration areas and for the turnaround of trucks and trailers. In addition, a significant portion of the budget would be allocated for utility upgrades and extensive landscape buffers due to limited available services and the surrounding residential zoning districts.

Alternative sites for new construction were discussed at the Commissioner and stakeholder input sessions. There were opinions of County Commissioners that the current site may be put to higher and better use through more neighborhood-focused development, including affordable housing or a recreation facility, and that the County could consider a larger, more rural site with additional space for large vehicle access and parking, and lower site development costs for the EAC. It is important that any alternative site remain peripheral to Hillsborough. Staff members were supportive of an alternative site as this would make new construction more feasible and would allow more of the project budget to be allocated to the building costs instead of the site costs.

Existing Building Assessment

The original 20,692 square foot structure was built in 1960 and operated as a Carr's Supermarket up until the mid-1980s. In the late 1980s, the building was converted into an office facility to house several government agencies with a focus on agricultural services. Due in part to its original construction, the facility has never been efficient in its interior layout, utilization of space, functionality, and energy efficiency.

The current building layout is limiting in terms of its access and circulation. Multiple entrances from the parking area do not connect to a common path of circulation at the interior. Currently, customers visiting the Soil and Water and FSA suites must exit and reenter the building to access the remaining suites. The corridor that serves the majority of the building is extensive and wayfinding signage is limited to assist visitors in locating departments. The largest meeting space is remotely located and is far from the main entrance.

The current department suites are inefficient in their use of floor space and feature redundant programming that could be better allocated within a new layout. The Soil and Water suite is undersized for the staff count and services the department provides. Other undersized spaces include the EAC Conference Room, Custodial Storage, and Food Lab. A large portion of the existing building is dedicated to shared County storage. Stored materials will be relocated so the departments can better utilize the interior space.

The building shell is composed of uninsulated load bearing masonry walls, long span structural steel trusses, and wood framed rafters. There are limited openings in the exterior walls, which may indicate unreinforced masonry and would require bracing to add additional openings. The roof currently leaks in several areas, including along the back exterior wall. The roof structure is undersized for accommodating additional loads (i.e. HVAC). Due to the age of construction, there is a possibility for hazardous materials in the building. Exterior and interior finishes of the building are deteriorating from age or mold.

Space Needs

The following is a detailed summary of the needs and requests for the Orange County Environment and Agricultural Center (EAC) and department suites. All four existing suites, NC Cooperative Extension, DEAPR Soil and Water Conservation District, USDA Farm Service Agency (FSA), and DEAPR Natural and Cultural Resources, Support Services, with the addition of USDA Forestry Services, will be included in the program.

Main Lobby

Employees and guests will arrive to the new facility through a single main entrance into a shared building lobby. A digital kiosk or staffed reception desk directs visitors to the five department suites or meeting spaces. The lobby will include a waiting area with seating for guests.

Circulation

All departments are located off of a simplified main corridor to assist guests with wayfinding.

Department Suites

FSA, Forest Services, and DEAPR Soil and Water Conservation District provide services to an overlapping customer base, and could better serve their customer's needs if they were located adjacently. In addition, DEAPR Natural and Cultural Resources, Support Services works closely with staff from the DEAPR Soil and Water Conservation District. A priority will be assigned to co-locating these divisions within the new facilities. The Cooperative Extension will need an easily accessible, prominent location within the facility for the department's high volume of walk-in guests. Workstations and private offices will be allocated uniform square footages across all suites, and all private offices will be lockable. The allocated square footages in the Owner-provided program outline are as follows:

- General Office: 120 - 150 SF
- Supervisor: 150 - 200 SF
- Director: 250 - 300 SF

"Hot," "Warm," and "Cold" Storage

Orange County is currently in the process of developing an official storage policy. These efforts are aimed at reducing and consolidating the amount of storage within office spaces through the use of a graduated temperature classification system:

- "Hot" – arms-length storage for daily-use items
- "Warm" – paper records storage for infrequently needed documents
- "Cold" – long term off-site storage (archives) where items are only access for audit purposes; located off-site

"Warm" paper record storage for EAC occupants will be relocated to the "car wash" facility. Orange County will evaluate renovation of the existing facility under a separate contract for climate control upgrades.

NC Cooperative Extension

Staff Work Spaces

The Cooperative Extensions requires working space for 12 employees and 2 volunteers.

- (1) County Extension Director
- (1) Administrative Assistant
- (1) 4H Youth Development

- (1) 4H Program Associate
- (1) EFNEP Assistant
- (1) EFNEP Agent
- (3) Area Spec. Agriculture Agents
- (1) Area Spec. Nursery & Greenhouse Agent
- (1) Agriculture Assistant
- (1) Agriculture Agent
- (2) Master Gardener Volunteers, located in Plant Specimens Lab

The Plant Specimens Lab will be staffed by the master gardener volunteers for two hours each day. The lab should be located near the suite entry so that the volunteer can operate as receptionists for walk-in guests.

Food Lab

The Food Lab is an integral multi-use component in the operations of the EAC. The current room is used as a demonstration kitchen, multi-purpose room, training area, and community meeting room. The new space would need to fulfill similar functions. The current meeting capacity in the Food Lab is about 60 occupants. The ideal meeting space should house 100 people. For meetings with over 100 occupants, the nearby Whitted Building will be implemented. A demonstration kitchen will be designated as a warming kitchen (no grease traps or commercial hoods to be included), and the adjacent viewing area should have the capacity for a 25 - 30 person audience. The kitchen should be adjacent to the large auditorium but could be closed off to allow for program food preparation during meetings. It should have a large roll up window for serving and for food preparation demonstrations.

Meeting Spaces

There is also a need for an internal small group meeting space, typically used for webinars, small conferences, etc. Larger office-wide meetings can be held in the Food Lab, or in a shared meeting space with other departments in the building.

Plant Specimens Lab

An area for sample processing and intake (dirt, plants, and insects) is to be provided. This area should be located near the suite entry/receiving area and can double as the Master Gardener's workspace. Walk-in visitors come here to seek direct audience with the Master Gardener with questions on horticulture, agriculture, etc. The biological sample room should include a bench, refrigerator, microscope, sinks with dirt traps, and soils analysis equipment.

Storage Needs

Equipment currently located in the car wash facility includes paper products for agency events (plates, napkins, etc.) and materials for 4H functions. The department has a need for this type of on-site storage for department operations (can be unconditioned). In the existing suite, square footage in Rooms E105 and E106 would be sufficient for daily-use storage needs in the new facility.

DEAPR - Soil and Water Conservation District

Staff Work Spaces

The Soil and Water suite will contain seven employees. Four employees are part of DEAPR and are full-time staff. Two employees are part of the USDA, with one full time and one part time position. One station will need to be provided for a future seasonal intern.

- (1) Resource Conservation Coordinator
- (2) Soil Conservation Coordinators
- (1) Resource Program Support Coordinator

- (1) NRCS District Conservationist
- (1) USDA Soil Technician (part time)
- (1) Seasonal Intern (future)

Staff are in and out of the office daily, with time split between the desk and the field. Full time staff will need private offices, however part time or seasonal staff would be able to share an office or an open work area. A priority will be placed on collocating the two divisions of DEAPR within the EAC, and the Resource Program Support Coordinator shall be located proximate to the Special Projects Coordinator in DEAPR Natural and Cultural Resources, Support Services. Walk-in customers vary by season, but usually average about six per day. A receiving counter adjacent to the suite entrance has been requested for receiving customers.

Meeting Spaces

Large meetings are currently held in the Food Lab. Due to its centralized location, the Orange County office occasionally hosts large regional training sessions with multiple districts. Meeting space for these training sessions will need to support between 50 – 60 attendees. Evening board meetings with 10 - 15 attendees occur monthly within the EAC conference room. A card security system and door chime for the main entrance is preferred to support evening meetings. Spaces for smaller inter-staff meetings are also needed, but anything larger could be held in shared building meeting spaces (as they currently are).

Work Spaces

A small meeting room with file storage, a printer/copier station, and a lay-down table for large maps and drawings would be sufficient for department needs. Soil and Water have access to large format plotters located in the DEAPR Natural and Cultural Resources, Support Services office suite. A shared break area is acceptable; a refrigerator and coffee station would need to be provided in the suite.

Storage Needs

The department needs daily access to survey equipment inside the suite. Map storage, as well as a library space for historic books, manuals, and equipment is needed. These areas can included in the small meeting room. A separate lockable storage room is also needed for customer records and financial information. The department currently uses the car wash facility for boxed storage.

USDA Farm Service Agency (FSA)

Staff Work Spaces

The staff currently consists of six employees, but there is potential for further staff growth. All faculty are Federal employees, with both FSA and FHA agents represented.

- (1) District Director
- (1) County Executive Director
- (1) Loan Analyst
- (1) Key Program Technician
- (1) Program Technician
- (1) FHA agent is in the department, representing Rural Development

Each staff member requires a 150 SF minimum private office including acoustic privacy. One 8x6 cubicle space for a trainee needs to be provided.

The department sees up to thirty farmers a day, there needs to be a reception counter (160 SF) for receiving the walk-ins. It would also be beneficial to have the FSA, Soil and Water, and Forest Services adjacent to each other in the building.

Meeting Spaces

A small meeting space that can accompany six to seven people bi-weekly and 12 - 15 people monthly is needed. The department also requests a training space that can hold fifty people.

Work Spaces

A space for file storage, two printers/copier stations, and a large lay-down table is also requested by the department. 170 SF of four-drawer file cabinets and 60 SF lateral file storage is needed. Additionally, a Federal mail station will be included in this area.

"Hot" Storage

Primary "hot" storage needs for the FSA include paper records, legal documents, client contracts, and other misc. document storage, including sensitive personal information. By the standards of the Federal Privacy Act, all department records must be stored within the department suite and cannot be removed or destroyed without prior authorization. The agency requests storage within the suite that is equivalent to what is currently present in existing facilities and will not need "warm" or "cold" record storage provided on site or elsewhere by the County.

USDA Forestry Services

Staff Work Spaces

The Forestry Services suite needs to provide two office spaces.

- (1) County Ranger
- (1) Assistant Ranger

The assistant does not need a private office. The County Ranger needs a place for secure files in the private office as well as a side meeting table with four chairs.

Meeting Needs

Only meeting space needed is the table located in the County Ranger's office.

Storage Needs

The staff asked for four filing cabinets and 800 SF of open storage.

DEAPR - Natural and Cultural Resources, Support Services

Staff Work Spaces

There are ten staff members currently working within the suite and there are three possible incoming employees and one volunteer.

- (1) DEAPR Director
- (1) Land Conservation Manager
- (1) Water Resources Coordinator
- (1) Cultural Resources Coordinator
- (1) Landscape Architect
- (1) Community Center Coordinator
- (1) Special Projects Coordinator
- (1) Communications Manager
- (1) Business Officer

- (1) Seasonal Intern
- (1) Land Conservationist Specialist (future)
- (1) Air Quality Specialist (future)
- (1) GIS / Resource Mapper (future)
- (1) Volunteer Site Steward

The Land Resources Conservation Manager maintains a significant number of records within his or her private office, as well as the resource library. Their office should be located adjacent to the resource library. The DEAPR Director maintains a number of confidential and personnel files within his or her private office and may require a special considerations for hardware keying. The Communications Manager should be located adjacent to the Director for direct support. The Community Center Coordinator currently floats between multiple office locations and can maintain a smaller working footprint within the EAC as needed. The Resource Program Support Coordinator from Soil and Water and the Special Projects Coordinator will need to be located proximate to one another. The Landscape Architect should be proximate to the plotter area. Lastly, an open workstation may be provided for the volunteer's work area.

Meeting Spaces

Significant meeting needs are associated with DEAPR, and the current conference spaces are undersized to meet those needs. A range of meeting sizes were identified during the staff interviews, and the following meeting spaces are required to support department functions:

- (1) Small workroom capable of supporting informal inter-staff meetings of 6-10 attendees.
- (1) Large formal conference room capable of supporting regular monthly board meetings of 25–30 attendees.
- (1) Large training room capable of supporting training seminars of 100 occupants in rows of seating, or 50-60 people in tables and chairs.

DEAPR needs to be adjacent to the Soil and Water District staff, and may potentially share an adjoining meeting room. Some staff requested to have several small meeting spaces.

Work Spaces

A small conference room could serve as a workspace. There needs to be a large lay-down table for maps and drawings, suitable tele-conferencing and distance learning type uses, as well as wall space for whiteboards and maps. Small inter-staff meetings could take place in here.

DEAPR houses two large-format plotters and two printer/copiers. A reference library is also needed, and should be located near the Resources Conservation Manager office.

Storage Needs

The department is currently using the small POD unit outside in the rear of the building for equipment storage. The suite has a wide variety of stored materials, including file cabinets, map/flat file storage, and miscellaneous equipment.

Service Spaces

IT/Data Room

A centrally located server room will be provided to house all County server equipment, as well as all low voltage equipment for the entire facility. The County IT and Data Room shall include adequate floor space for servers dedicated to County departments and the NC Cooperative Extension. The County room will include low voltage systems, a fire alarm system, building security, and telephone/data boxes.

Custodial Room

Custodial service will need a minimum 8'x10' dedicated closet with a mop basin, storage for cleaning supplies and clear floor spaces for (2) floor scrubbers.

Restrooms

Two centrally located gang restrooms (Men's and Women's) will serve as the primary restroom facilities. A single-occupant family restroom and a (separate) mother's lounge will also be provided.

Break Room

A shared break room will be provided with seating for 12-16 staff members. Programming will include a food preparation area, a double sink, a coffee bar, a microwave station, and floor space for two standard refrigerator/freezers and waste/recycle receptacles.

Outdoor Spaces

An open-air veranda or similar semi-covered outdoor programming would be provided to house an outdoor demonstration kitchen, a farmer's market, a demonstration compost facility, or a general County meeting place. The veranda would also provide a common outdoor break area adjacent to the interior break room.

Other outdoor spaces requested are a demonstration garden for the Master Gardener and a 20' paddock expansion located at the rear of the building. The paddock will serve as an animal husbandry exhibit that could also double as a County Animal Services outdoor staging or overflow area.

Parking Area

Final parking quantities are contingent upon the overall building occupancy. However, it is not anticipated that existing lot will require expansion for the renovation options. Ease of vehicle access is one of the primary facility concerns for the agricultural community. Priority consideration will be given to access and circulation of large vehicles and trailers throughout the parking area, and parking for trailers and larger vehicles will be included. Safe access to Revere Road will also be addressed, and the existing southeast access drive may be converted to a one-way ingress drive.

Architectural Narrative

Option 1 – Major Renovation

The major renovation option proposes the existing building shell remain in place with a complete interior deconstruction and a new interior layout. The new layout will enhance customer and employee experience through improved building circulation, new office suites, and improved conference and meeting spaces.

Fire Protection

The work area for the major renovation exceeds 50% of the building area and is considered a Level 3 alteration per the NC Existing Building Code (505.1). The existing building is a type VB construction with areas of unprotected wood framing in the roof assembly. Fire protection upgrades are required for the renovation based on the construction type, intended occupancy, and overall building square footage. An NFPA automatic fire sprinkler system has been included to meet these life safety requirements.

Exterior Envelope

The exterior envelope is required to undergo an energy retrofit as part of the Level 3 alterations (908.1). A new continuous wall insulation will be retrofit over the partially insulated existing CMU walls to meet the code requirements. An exterior insulated finish system (EIFS) cladding will be installed over the continuous insulation as a cost-effective solution. Special cladding considerations will be made to maintain the quality of the building façade, as well as east elevation, where there are areas of high visibility. All cladding systems will include a new weather barrier system.

Exterior envelope improvements also include the full replacement of the exterior doors and windows with energy efficient upgrades. All joints, penetrations, and flashings around openings will be replaced.

Roofing

To address the long-standing history with roof leaks, the existing standing seam metal roof will be replaced with a new PVC membrane roof system. Replacement metal panel roofing will be provided along the existing mansard roofs to maintain the aesthetic quality of these features. New fiberglass batt insulation will be installed in the attic area at the underside of the rafters as part of this work.

Interiors

The building interior will undergo a major gut and renovation to provide an improved layout, to better support customer service, and to improve workflow. 15,602 SF of the existing 20,692 SF footprint is anticipated to address the building program and will undergo the full interior renovation. The remaining 5,090 SF will be partially renovated as core and shell area for future development.

15,602 SF Full Interior Renovation

- Interior partition framing and drywall finish:
 - Rationalized building circulation
 - New office suites
 - New restroom facilities
- Finishes:
 - LVT resilient flooring and carpet flooring
 - Acoustic tile and GWB ceilings

- Painted GWB wall finish
- Wood doors
- Plastic laminate casework in standard sizes

5,090 SF core and shell area

- Minimal interior work for core/shell space
- Basic ACT ceiling
- Concrete sealant
- Storage cages

Specialties

Specialties include new stall partitions and restroom accessories typical of an office facility, as well as all interior building signage.

Option 2A & 2B – New Pre-Engineered and New Conventional Construction

The new construction options consider both conventional and pre-engineered solutions for the complete removal and replacement of the existing facility on the same site. Both options consider a similar footprint for the new building, as well as a similar overall building size.

Option 2A – New Pre-Engineered Construction represents a hybrid construction delivery with a pre-engineered metal structure and roof system that offers cost reductions, and a more conventional exterior wall cladding system that provides an enhanced aesthetic appropriate for a public building. The interior fit-out is similar to a conventional construction approach.

Option 2B – New Conventional Construction represents a typical construction approach for a single-storey, steel frame construction. While the up-front construction costs would be higher than a pre-engineered package, the benefits include ease of modification or building expansion in the future.

Fire Protection

The Town of Hillsborough Code of Ordinances requires all new commercial structures exceeding 3,600 SF be equipped throughout with an NFPA automatic fire sprinkler system (Sec. 12-17). Because the building will feature an automatic sprinkler system, any construction type listed in the code will meet the allowable area criteria for the building occupancy at 15,030 SF due to the automatic sprinkler increase. A Type IIB construction was considered for both Options 2A and 2B as the most economical construction type for the proposed building footprint.

Exterior Envelope

Both new construction options will be constructed to meet the energy code requirements for new construction. This includes a combination batt insulation in the stud cavity and continuous rigid insulation on the exterior face of the wall framing. Both options will also include storefront glazing and punched aluminum windows with insulated glazing and thermal breaks.

The cladding for the pre-engineered option includes a tall, stacked brick water table around the full perimeter of the building as well as metal panel cladding above the water table. The cladding for the conventional option includes multiple patterns of commercial fiber cement cladding with aluminum trim.

Roofing

The pre-engineered option includes sloped gable roof throughout, with the manufacturer's standard, prefinished metal roof panels. Options include both exposed fastener and standing seam panel options. The system also includes an integrated insulation system to meet the energy code as well as a continuous vapor retarder. No rooftop equipment will be mounted on the roof.

The conventional option includes a flat roof design with continuous, above-deck rigid insulation and a PVC membrane roof. This option will also feature rooftop equipment mounted on raised curbs.

Interiors

The interiors for both new construction options will be similar in scope to the full interior renovation of the major renovation option:

- Interior partition framing and drywall finish
- Finishes:
 - LVT resilient flooring and carpet flooring
 - Acoustic tile and GWB ceilings
 - Painted GWB wall finish
 - Wood doors
- Plastic laminate casework in standard sizes

Specialties

Specialties for both new construction options will also be similar to the major renovation option with all restroom specialties and interior building signage.

Background on Pre-Engineered New Construction

As part of the study exercise, the Design Team was asked to consider pre-engineered steel construction option as a more cost effective approach for a new build scenario. While there have been significant advances by pre-engineered manufacturers over the last 30-40 years, the industry has moved into the community and commercial market, and today offers competitive, versatile options that are competitive to similar single-story conventional approaches.

Today, all buildings contain some number of pre-manufactured components, and there is a blend of field-built and factory work from a variety of trades and suppliers. Pre-engineered steel construction shifts more of the balance of work under single manufacturer, with more work performed in the factory. However, a substantial number of components remain field-fabricated, including the building foundations, enhanced exterior cladding, the interior upfit work, and any custom exterior components. There are many benefits and limitations when evaluating pre-engineered construction:

- Advantages:
 - Reduced construction time -> reduced cost
 - Scale of economy for building products -> reduced cost
 - Efficient structure; reduces excess material
 - Ideal building type for single-story construction
 - High recycled content of steel; 100% recyclable
 - Long life span of metal roofing, 20-30 years

- Disadvantages:
 - Ground-based mechanical systems; no equipment located on roof
 - Building footprint is a more regular shape; wants to be rectangular
 - Wall cladding has been problematic in the past; needs special attention to detailing
 - More difficult to retrofit for future expansion work

The approach proposed for Option 2A – New Pre-Engineered Construction represents a hybrid blend of pre-engineered and conventional construction in order to take advantage of the best of both worlds. The steel framing, roof cladding, and a portion of the wall cladding would be provided by the pre-engineered manufacturer, while the interior upfit, enhanced exterior wall cladding, and custom exterior work would follow a conventional construction approach.

Careful considerations were also made for the exterior walls and cladding, where envelope tightness, long-term durability, and enhanced aesthetics are addressed with a conventional stud framing, sheathing, and weather barrier assembly, and a mixed masonry veneer and metal reveal panel cladding. It is important to the County that the pre-engineered option follows a high aesthetic standard characteristic of a community building, and that the long-term durability of the envelope is comparable to conventional construction.

Pre-engineered Examples



Boys and Girls Club of the Smokey Mountains, Gatlinburg, TN



American Legion Post 11, Lafayette, IN



Site Conditions

The existing site is a single 4.08-acre parcel of land owned by Orange County situated in the Planning jurisdiction and corporate limits of the Town of Hillsborough. The property is zoned for commercial use and has frontage on two public roadways with two driveway connections to Revere Road (North Carolina DOT) and one driveway connection to Old Cedar Grove Road (Town of Hillsborough). It contains three buildings, paved parking areas, gravel-surfaced parking and service areas, and connected utility services.

Several site conditions and physical improvements are non-conforming relative to current regulatory requirements, which would be generally applicable to new construction. The non-conformities include inadequate or non-standard perimeter landscape buffers, solid waste management facilities, and site accessibility features; possibly inadequate grease interceptor capacity and site lighting coverage; insufficient property line setback for the south side of the “EMS” building; absence of public sidewalks along street frontages; absence of onsite stormwater management facilities; and encroachment of an internal paved driveway into the street right-of-way.

The existing pavement on the property is in a significantly deteriorated state, although still functional. Most of the onsite pavement exhibits severe “alligator cracking”, but only a small percentage exhibits rutting or significant differential settlement. Some irregular areas within or adjacent to pavement areas appear to have a loose gravel surface, but these appear to be remnants of a severely deteriorated pavement structure.

Vested Rights

The existing facilities, although somewhat non-conforming, have a vested right to remain in place and in service until some triggering event contravenes this right. Non-conformities generally cannot be increased or made more severe, and are usually required to be corrected upon significant re-development of the property. When a non-conforming property is renovated, the full application of current requirements may or may not be triggered depending on the extent of the new work.

To the degree that a non-conforming condition allows property usage or benefit which could not be achieved with full regulatory compliance, the vested non-conformity may be understood as an inherent and unique component of property value, which would likely be irreversibly forfeited upon renovating or redeveloping the property (or upon substantial damage by a fire, etc.). This value should be voluntarily relinquished only when the benefits associated with redevelopment outweigh the loss.

Option 1 - Major Renovation

The larger office building on the property may be renovated in place without triggering full compliance of all non-conformities, as long as the building floor area is not increased, the landscape buffer width to the west is not reduced, and the building footprint is not substantially altered. Unresolved questions remain about the ability to retain the main parking lot in its current configuration. This lot almost fully encroaches into a prescribed 40' wide perimeter buffer along the western property edge, encroaches into the public street right-of-way, has non-compliant accessibility to the main building entry, and other lesser irregularities. Similarly, the building encroaches into the prescribed western buffer width, but this condition does not inherently preclude building renovation.

The current renovation plan proposes very limited sitework to accommodate new parking improvements for larger vehicles and maintenance of existing pavement areas. The relatively low impact of this work will likely be non-triggering for most aspects of parking lot compliance. From a regulatory perspective, the primary building requires about fifty parking spaces. About 62 spaces currently exist in the front parking area.

Both public streets adjoining the property are designated as having "priority sidewalk recommendations" which means that sidewalk installation along these frontages will typically be required when there is "... construction of a new principal structure on a parcel, or significant renovation of an existing structure or vehicle accommodation area that disturbs 50% or more of the parcel area." (ref. Hillsborough UDO 6.17.2). The proposed building renovation scope is probably "significant" but the disturbed area on the parcel will not rise to a 50% threshold, so the sidewalk requirement is currently assumed to be inapplicable. This assumption requires confirmation by the Town of Hillsborough.

Regarding stormwater management, no structural stormwater measure will be required if the amount of new impervious surface area is not increased by the project. The proposed renovation option will not increase the onsite impervious surface area.

Existing domestic water and sanitary sewer services for the building are expected to be able to remain in service, although the grease interceptor will likely require replacement with a larger device. The building may require installation of a new automatic fire protection sprinkler system, which would require extension of a water supply line with appropriate backflow prevention and other devices.

Without having detailed discussions with the Town of Hillsborough, we expect that the most likely scope associated with the Major Renovation option will include no significant parking or circulation changes to the main parking lot, no installation (or payment-in-lieu) of sidewalks along public streets, no requirement for a stormwater management device, addition of some landscape buffer and parking screening plantings, extension of a water main to serve a fire protection sprinkler system, and installation of accessibility improvements including accessible routes from the parking lot to the main building entry and from the building entry to Revere Road.

Options 2A and 2B - New Construction

These options are virtually identical from a sitework perspective. They both include complete demolition and rebuilding of the primary building and parking area, essentially inverting the locations of each in order to achieve a better aesthetic and functional condition than could be achieved by renovation. These options would retain the existing eastern driveway connection to Revere Road, and the driveway connection to Old Cedar Grove Road. The new building and rear parking area would be located either the prescribed 40' distance from the western property line, or such lesser distance as may be discretionally approved under an "alternate buffer" scenario. The eastern driveway should be allowed to remain in its current location since no buffer requirement is prescribed along this property line; and as a driveway, it is not subject to minimum building setback requirements. From a regulatory perspective, the primary building will require about fifty four parking spaces, which is approximately the number shown for this option.

Sidewalk construction along both public street frontages will almost certainly be required with construction of a new primary building. This work should be relatively straightforward along Revere Road, but will require a significant amount of clearing, grading, and drainage work along Old Cedar Grove Road.

Both New Construction options will have approximately the same amount of impervious surface area as the current condition. In order to avoid installation of a structural stormwater management device, no net increase in impervious area will be allowed. The sidewalk work will count as new impervious area, even though it will be technically off the property. Site design for either of these options must be frugal with impervious surface area in order to achieve the assumed stormwater exemption.

These options assume essentially new domestic water and sanitary sewer services for the building, while retaining the existing utility connection points to the respective mains. The new building will require installation of a new automatic fire protection sprinkler system, which will require extension of a water supply main with appropriate backflow prevention and other devices. Also, with such extensive site redevelopment, new solid waste and recycling facilities will be required for the site, as well as full compliance with site accessibility, landscaping, and site lighting requirements.



Structural Narrative

Option 1 – Major Renovation:

Existing Building:

The existing Orange County EAC building is a one-story structure consisting of a first floor slab-on-grade with 8 inch, exterior, load-bearing CMU walls and interior steel pipe columns. There are 16 inch, square, CMU pilasters built integrally with the eastern and western exterior CMU walls spaced at approximately 16 feet on center. The roof structure consists of wood decking on 2x8 wood rafters at 16 inches on center, supported by steel trusses framed with tube and pipe sections. The steel trusses span between the pilasters at the east and west exterior walls and are supported intermediately by the steel pipe columns.

Two additions have been made to the building. The first, at the southeast corner of the building, consists of a concrete slab-on-grade with exterior load-bearing CMU walls. The roof consists of tongue and groove wood decking on 2x8 wood rafters at 16 inches on center, supported by wide-flange steel beams. The beams span east-west between load-bearing CMU walls. The second addition, at the front (southern side) of the building, appears to consist of a first floor slab-on-grade and exterior load-bearing CMU walls with brick veneer. The roof structure, however, could not be determined due to a dry-wall ceiling.

The existing building was noted to be in fair structural condition with only minor visible corrosion of the steel structure, and only minor cracks in the masonry walls; however, there exist multiple items of concern with the existing construction. These items are as follows:

- The exterior load-bearing CMU walls are likely unreinforced, as was typical of the era of construction. These walls likely do not comply with current code requirements for wind and seismic lateral loading. Although the building code would only require locally reinforcing the walls at new openings to meet current code, this is an item of safety that should be considered.
- There were no hurricane ties between the existing roof rafters and load bearing CMU walls, which does not comply with current building code. The building code would only require adding the hurricane ties where modifications are made, but this is an item that should be considered as high winds could cause damage to the roof structure.
- It appeared that multiple window openings have been added to the east and west exterior walls. Current building code only allows the stresses in members carrying lateral (wind and seismic) loads to increase by 10% without strengthening or analyzing the existing structure. The

exterior CMU walls act as the building's shear walls and the current openings have increased the stresses in these walls beyond the 10% threshold. This will require the addition of a new lateral system to replace the east and west exterior shear walls.

- Current building code allows a 5% increase in stress to any gravity load carrying member without strengthening or analysis of the existing structure. Re-roofing the building or code required fire proofing upgrades will likely increase the stress to all gravity load carrying members by more than 5%. This will require a comprehensive structural analysis and possible strengthening of the entire roof structure; the costs associated with this are difficult to determine.

Renovations:

The renovation programming requires major renovation to the buildings lateral force resisting system as well as minor demolition and reinforcement of existing exterior CMU walls to add new openings. The following comprise the structural renovations required:

- Infill existing CMU wall openings with new reinforced CMU where required
- Cut in new openings in CMU walls for windows and doors. Locally reinforce the existing CMU around the openings to meet current building code.
- Re-point cracks in existing CMU mortar joints.
- Replace CMU that is cracked through the block itself.
- Add two braced frames at the east and west sides of the building within the new shell space to replace the existing CMU shear walls that have been modified beyond the 10% threshold.
 - Alternatively, a comprehensive structural analysis of the existing unreinforced CMU shear walls may reveal that the strength provided by the existing walls is adequate to resist the code prescribed loads. In this case, the two new braced frames may not be required.
- If the roof loading is increased due to re-roofing or fire proofing upgrades, analyze the existing roof structure and reinforce existing structural members as required.
 - A comprehensive analysis of the existing structural conditions to determine existing member sizes, steel grades, wood grades, and weld sizes will need to be performed.
 - Reinforcing may include, but is not limited to, reinforcing existing structural steel truss members, increasing existing weld sizes, and sistering existing wood rafters.

Option 2A – New Pre-Engineered Construction:

Foundations:

Foundations will be designed in accordance with the recommendations in the Report of Subsurface Exploration and Geotechnical Engineering Services by ECS, Dated February 12, 2016. Shallow foundations will be designed for a net allowable bearing pressure of 3,000 pounds per square foot, in accordance with this report.

Exterior pre-engineered building columns will be supported on a continuous turn-down slab system on individual spread footings centered on each column. Thrust forces induced by the rigid frame beam and column system will be resisted by reinforcing within the slab-on-grade. Interior columns and columns for the conventional entrance canopy will be supported on individual spread footings.

- Foundation concrete will be $f'c = 3000$ psi, normal weight
- Slab-on-grade concrete will be $f'c = 3500$ psi, normal weight
- Top of footing elevations will typically be 1'-4" below the finished floor elevation
- Slabs-on-grade will be 5" thick reinforced with welded wire reinforcing on 15-mil vapor retarder and a 4" depth of porous fill.

Structure:

The gable roof construction will consist of steel rigid frames with two intermediate columns, spaced at approximately 25 feet to 30 feet on center, supporting cold formed Z-purlins and a standing seam metal roof deck. Rigid frame beams and columns will be custom, tapered, wide flange sections.

A custom structural steel entrance awning will be provided with HSS columns supporting wide flange beams and a 1 ½" metal roof deck.

Exterior Walls:

Exterior wall construction will consist of horizontal cold formed metal Z-purlins with intermediate vertical cold formed metal studs supporting a combination of masonry veneer and a metal panel.

Lateral Load Resistance:

Resistance to wind and seismic loads will be accomplished with the steel rigid frames in one direction, and steel rod bracing in the orthogonal direction.

Design Loads:

Design of this building will be in accordance with the 2012 North Carolina State Building Code. Structural design loads are anticipated to be as listed below:

Building Occupancy Category = II

Live Loads:

Slabs-On-Grade = 100 psf
Roof = 20 psf

Snow Loads:

Ground Snow Load, $pg = 15$ psf

Importance Factor, $I_s = 1.0$
Exposure Factor, $C_e = 1.0$
Thermal Factor, $C_t = 1.0$

Wind Loads:

Basic Wind Speed = 90 mph (3 second gust)
Exposure = B
Importance Factor, $I_w = 1.0$
Internal Pressure Coefficient = +/-0.18

Seismic Loads:

Importance Factor, $I_s = 1.0$
Site Classification = D
Spectral Response Accelerations:
 $S_s = 19.9\%g$ $S_1 = 7.8\%g$
 $S_{ms} = 31.9\%g$ $S_{m1} = 18.7\%g$
 $S_{ds} = 21.3\%g$ $S_{d1} = 12.5\%g$
Seismic Design Category = B
Analysis Procedure = Equivalent Lateral Force

Option 2B – New Conventional Construction:

Foundations:

Foundations will be designed in accordance with the recommendations in the Report of Subsurface Exploration and Geotechnical Engineering Services by ECS, Dated February 12, 2016. Shallow foundations will be designed for a net allowable bearing pressure of 3,000 pounds per square foot, in accordance with this report.

Columns will be supported on conventional spread footings, while continuous wall footings will support exterior foundation walls.

- Foundation concrete will be $f'_c = 3000$ psi, normal weight
- Slab-on-grade concrete will be $f'_c = 3500$ psi, normal weight
- Top of footing elevations will typically be 1'-4" below the finished floor elevation
- Slabs-on-grade will be 4" thick reinforced with welded wire reinforcing on 15-mil vapor retarder and a 4" depth of porous fill.

Roof Structure:

Roof construction will consist of steel beams and open web steel joists supporting a 1-1/2" roof deck. The roof structure will be supported by rectangular HSS steel columns roughly 5 to 6 inches wide. Roof elevations will be varied for aesthetics, thus, low roof structures will be required to support the weight of veneer from the upper walls.

Exterior Walls:

Exterior wall construction will consist of 6" metal studs supporting a combination of masonry veneer and a lighter EIFS veneer. Additionally, a pop-up roof will be clad with clear story storefront on one side.

Lateral Load Resistance:

Resistance to wind and seismic loads will be accomplished with structural steel braced frames.

Design Loads:

Design of this building will be in accordance with the 2012 North Carolina State Building Code. Structural design loads are anticipated to be as listed below:

Building Occupancy Category = II

Live Loads:

Slabs-On-Grade = 100 psf
Roof = 20 psf

Snow Loads:

Ground Snow Load, $p_g = 15$ psf
Importance Factor, $I_s = 1.0$
Exposure Factor, $C_e = 1.0$
Thermal Factor, $C_t = 1.0$

Wind Loads:

Basic Wind Speed = 90 mph (3 second gust)
Exposure = B
Importance Factor, $I_w = 1.0$
Internal Pressure Coefficient = +/-0.18

Seismic Loads:

Importance Factor, $I_s = 1.0$
Site Classification = D
Spectral Response Accelerations:
 $S_s = 19.9\%g$ $S_1 = 7.8\%g$
 $S_{ms} = 31.9\%g$ $S_{m1} = 18.7\%g$
 $S_{ds} = 21.3\%g$ $S_{d1} = 12.5\%g$
Seismic Design Category = B
Analysis Procedure = Equivalent Lateral Force

Mechanical & Electrical Preliminary Study
Orange County Environment & Agricultural CenterFIRE SPRINKLER

The existing building is not currently protected by a fire sprinkler system.

If proposed facility upgrade options, renovation or new construction, include the installation of a fire sprinkler system, then a fire pump should be anticipated. Fire flow data has not been provided yet, but based on discussions with the Owner, as well as the visibly low water pressure in the building currently, it seems as if the available water pressure to the site is inadequate to support a fire sprinkler system unassisted.

A NFPA 13 fire sprinkler system would be installed in occupied spaces (new or renovated). Piping would be steel. The attic space of the current facility is large enough to require separate fire sprinkler coverage in addition to coverage in occupied spaces below. The location of fire sprinkler piping (unconditioned attic, etc.) would dictate the application of a wet pipe or dry pipe system.

Areas designed to be core and shell space (unoccupied) would include code minimum fire sprinkler suitable for future fit-up.

PLUMBING

Aside from various plumbing fixture replacements through the years, it appears as if the building plumbing system dates back to 1989 when the facility was acquired and originally renovated by the Orange County.

A 2" water main appears to enter on the west side of the building, rising above grade before entering the facility. This is a freezing hazard. A backflow preventer was not found during our site visit. The Owner indicated that the sanitary system exits the east side of the building. It is presumed to be 4".

The existing building appears to have a copper water piping and cast iron sanitary piping infrastructure. Areas with plumbing consist of group toilets, teaching kitchen, break/work room sinks and individual toilets. The Owner reports both low available water pressure, as well as poorly performing sanitary drainage (clogs, etc.). Plumbing fixtures are generally dated equipment and residential grade in nature. Flush tank water closets are necessary due to low water pressure. Maintenance and care of the plumbing fixtures is commendable and can extend the life of the system; however, the poor performance of the piping infrastructure, as well as the lack of commercial/institutional grade fixtures suggest that an overall replacement of the plumbing system is warranted.

As part of a major renovation to the existing facility, the entire plumbing system should be replaced. For this option, or as part of a newly constructed facility, plumbing fixtures should be code and handicap compliant, as well as commercial grade. Interior water piping should be copper and fully insulated. Sanitary piping inside the building may be PVC as is preferred by the Owner. If feasible, exterior water mains and sanitary sewer mains should be considered for replacement due to age and poor performance. We understand that the teaching kitchen is of a scale and use to not require a grease trap. A water reclamation was considered; however, the cost does not seem to fit within the available budget.

Areas designed to be core and shell space (unoccupied) would include no water services and only basic sanitary drain pipe extensions below slab for future fit-up.

HVAC

Many of the existing HVAC units appear to have been replaced at some time during the last 27 years since the facility was purchased and renovated by Orange County; however, the ductwork infrastructure appears to be largely original.

The existing HVAC systems serving the north side of the building are primarily packaged gas-packs (natural gas heat, electric DX cooling) mounted on the ground next to the building with supply and return ductwork extended throughout the attic to ceiling air registers. These systems are generally large enough to serve a sizeable floor area, which in this instance equates to poor zoning because a single thermostat then controls rooms with competing heat loss/gain (interior versus exterior spaces, etc.). The south half of the building is served mostly by system heat pumps with ground mounted condensing units and interior (attic or mechanical room) air handling units. Overall, HVAC units vary from residential grade to light commercial grade. Ductwork is primarily galvanized sheet metal with some flexible duct runouts. Ductwork insulation is a mix between external and internal.

Based on the age of the HVAC infrastructure, complaints from occupants regarding temperatures, evidence of supplementary heaters and fans throughout the facility, and review of HVAC zoning, there is a strong indication that the current HVAC system is poorly performing to the point of requiring a complete replacement.

As part of a major renovation to the existing facility, it is recommended that new split system heat pumps (electric heat, electric DX cooling) be utilized throughout the facility with air handling units above ceiling (attic space) and condensing units ground mounted adjacent to the building. By using the ample attic space to house equipment, this will reduce the need for loss of building floor area to house mechanical equipment. Rooftop HVAC was considered as an alternative in order to continue using natural gas for heating, however the existing roof structure is not substantial enough to support this equipment. For a new conventional construction facility, it is recommended that packaged rooftop gas packs (natural gas heat, electric DX cooling) be utilized. For a new pre-engineered facility, rooftop units are not recommended, but rather above ceiling split system heat pumps similar to the major renovation HVAC option mentioned above.

For both a major renovation or new construction, new HVAC systems should be sized and zoned to serve approximately 600-1,000 SF each with areas segregated based on exterior/interior exposure and internal heat gain (equipment, occupancy, etc.). Controls should not be complicated but should have some level of interconnectability even though the budget will not likely support a DDC system. We understand that the teaching kitchen is of a scale and use to require a commercial kitchen hood. Geothermal HVAC was considered, however the cost add was not conducive to the available budget.

Areas designed to be core and shell space (unoccupied) would have no cooling, no ventilation, and only minimal heating for freeze-proof purposes.

ELECTRICAL

The existing building main 208 volt, 3-phase, 1600 amp switchboard appears to be original to the building (1960 grocery store). Duke Power is the utility provider. Secondary power panels have been replaced within the last 27 years. Although some branch circuitry to receptacles, etc has been replaced, much appears to be original to the 1989 renovation when Orange County purchased and renovated the building. Interior lighting is florescent and has been maintained well. Emergency egress lighting is battery powered and appears reasonably new and adequate in coverage. Exterior lighting is leased. Fire alarm protection is minimal at best.

The main switchboard is very old and should be replaced as soon as feasible. Access to this equipment should also be improved. While most of the secondary power panels are functional and not too old, the building overall suffers from inadequate branch circuitry as evidenced by numerous instances of extension cords and overloaded power strips. The maintenance and spot-repair efforts noticed are commendable; however, the system overall is aged in critical areas and not designed to serve a modern

office environment. As part of a major renovation effort, the electrical system should be completely replaced.

As part of a new electrical system installation (major renovation or new facility), a new service and switchboard should be sized to support the building program functions with some spare capacity. Secondary power and circuitry should be ample to serve all office programs. Lighting should be LED in order to not only save on operating cost, but also to be in-step with prevailing technologies. An addressable fire alarm system and a separate security system should be provided to protect the facility and its occupants. Teledata systems are to be provided by the Owner. Features such as a generator system, PV generated power and daylighting have been considered, but the budget appears insufficient to support inclusion of these types of systems.

Areas designed to be core and shell space (unoccupied) would only have minimal lighting and minimal fire alarm as required by code for an unoccupied space.

Orange County EAC

Opinion of Probable Cost - Option 1 - Major Renovation

January 12, 2017

Preliminary Study

HH Project #: 15-082

Basic Scope		Enclosed Office		Open Office	
Environment and Agriculture Center			\$101.80 per sf		\$2,106,362
Selective Building Deconstruction	20,692 sf	\$4.00 per sf	\$82,768	\$4.00 per sf	\$82,768
Exterior Envelope	20,692 sf	\$6.00 per sf	\$124,152	\$6.00 per sf	\$124,152
Roofing (replacement)	20,692 sf	\$12.00 per sf	\$248,304	\$12.00 per sf	\$248,304
Interiors					
Full interior renovation	15,602 sf	\$21.00 per sf	\$327,642	\$20.00 per sf	\$312,040
Core and shell areas	5,090 sf	\$4.00 per sf	\$20,360	\$4.00 per sf	\$20,360
Specialties	15,602 sf	\$3.00 per sf	\$46,806	\$3.00 per sf	\$46,806
Structure - retrofit braced bays	1 ls	\$90,000.00 ls	\$90,000	\$90,000.00 ls	\$90,000
Plumbing	20,692 sf	\$6.00 per sf	\$124,152	\$6.00 per sf	\$124,152
Mechanical	20,692 sf	\$20.50 per sf	\$424,186	\$19.75 per sf	\$408,667
Electrical	20,692 sf	\$20.50 per sf	\$424,186	\$20.00 per sf	\$413,840
Fire Protection	20,692 sf	\$5.50 per sf	\$113,806	\$5.15 per sf	\$106,564
Fire Pump	1 ls	\$80,000.00 ls	\$80,000	\$80,000.00 ls	\$80,000
Site Improvements					
	1 ls	\$188,060.00 ls	\$188,060	\$188,060.00 ls	\$188,060
Subtotal Estimated Base Construction Cost			\$110.88 per sf		\$2,294,422
General Conditions (44 weeks at \$4,000 per week)			\$176,000		\$176,000
GC's Overhead and Profit (7% of Base Construction Cost)			\$160,610		\$157,200
Design Contingency (10% of Base Construction Cost)			\$229,442		\$224,571
Subtotal Estimated Construction Cost (with General Conditions and GC OH&P)			\$138.24 per sf		\$2,860,474
Construction Contingency (5% of Construction Cost Subtotal)			\$143,024		\$140,174
Total Estimated Construction Cost (with Contingency)			\$145.15 per sf		\$3,003,497
FFE			\$102,500		\$102,500
Special Inspections, Materials Testing			\$25,000		\$25,000
Design Fee			\$344,300		\$344,300
Total Estimated Project Costs			\$167.95 per sf		\$3,475,297
Escalation Factor (6%)*			\$208,500.00		\$204,900
Total Estimated Project Costs w/ Escalation			\$178.03 per sf		\$3,683,797
				\$174.96 per sf	\$3,620,358

* NOTE: The estimated project cost is based on 2017 cost data. Due to the recent and anticipated rise in construction material and labor costs, as well as the length of time before construction on this project begins, the Design Team recommends adding a 6% escalation factor to the EAC project budget.

In providing this opinion of probable cost, it must be understood that we have no control over costs or the price of labor, equipment or materials, contractors' methods of determining bid prices, competitive bidding, market or negotiating conditions. Accordingly, we cannot and do not warrant that bids or negotiated prices vary from our opinion. We make no warranty, express, or implied, as to the accuracy of any opinion we may give as compared to bid or actual cost.

Exclusions:

- Cost increase for phased construction during renovation
- No Public Roadway Improvements
- Rainwater Cisterns or Irrigation Equipment
- Stormwater Treatment or Detention Device
- Amenity Structures or Site Furniture
- Drainage Improvements in Street Rights of Way (Roof Drainage Only is Included)
- Livestock Paddock Fencing or Equipment
- New Domestic Water Service for the Building
- New Gas or Electric Services for the Building
- Special Gardening Features or Equipment
- Security or Decorative Fencing or Gates
- Site Lighting
- Landscaping Beyond Code Requirements
- New Project ID Sign at Street Frontage
- Public sidewalks along Revere Rd. and Old Cedar Grove Rd. add \$67,250
- Demonstration gardens add \$40,000
- Asbestos Abatement (add est. \$30,000 if required)

*Design Contingency:

- Unforeseen building and site conditions
- Building systems (P, M, & E) contingency
- Structural systems contingency
- Site work contingency
- Any additional building components not yet designed
- Any additional programming not yet defined
- Specialty materials and finishes not yet defined

Orange County EAC

Opinion of Probable Cost - Option 2A - New Pre-Engineered Construction

January 12, 2017

Preliminary Study
HH Project #: 15-082

Basic Scope		Enclosed Office		Open Office	
Environment and Agriculture Center		\$143.58 per sf	\$2,158,052	\$140.98 per sf	\$2,118,974
Building Demolition	20,692 sf	\$6.00 per sf	\$124,152	\$6.00 per sf	\$124,152
Exterior Envelope (storefront + brick only)	15,030 sf	\$10.00 per sf	\$150,300	\$10.00 per sf	\$150,300
Interiors	15,030 sf	\$21.00 per sf	\$315,630	\$20.00 per sf	\$300,600
Specialties	15,030 sf	\$3.00 per sf	\$45,090	\$3.00 per sf	\$45,090
Structure (includes roof and wall cladding)	15,030 sf	\$35.00 per sf	\$526,050	\$35.00 per sf	\$526,050
Plumbing	15,030 sf	\$7.00 per sf	\$105,210	\$7.00 per sf	\$105,210
Mechanical	15,030 sf	\$25.00 per sf	\$375,750	\$24.25 ls	\$364,478
Electrical	15,030 sf	\$25.00 per sf	\$375,750	\$24.50 per sf	\$368,235
Fire Protection	15,030 sf	\$4.00 per sf	\$60,120	\$3.65 per sf	\$54,860
Fire Pump	1 ls	\$80,000.00 ls	\$80,000	\$80,000.00 per sf	\$80,000
Site Improvements	1 ls	\$636,250.00 ls	\$636,250	\$636,250.00 ls	\$636,250
Subtotal Estimated Base Construction Cost		\$185.91 per sf	\$2,794,302	\$183.31 per sf	\$2,755,224
General Conditions (40 weeks at \$3,500 per week)			\$140,000		\$140,000
GC's Overhead and Profit (7% of Base Construction Cost)			\$195,601		\$192,866
Design Contingency (10% of Base Construction Cost)			\$279,430		\$275,522
Subtotal Estimated Construction Cost (with General Conditions and GC OH&P)		\$226.84 per sf	\$3,409,333	\$223.79 per sf	\$3,363,612
Construction Contingency (3% of Construction Cost Subtotal)			\$102,280		\$100,908
Total Estimated Construction Cost (with Contingency)		\$233.64 per sf	\$3,511,613	\$230.51 per sf	\$3,464,520
FFE			\$102,500		\$102,500
Special Inspections, Materials Testing			\$25,000		\$25,000
Design Fee			\$311,400		\$311,400
Total Estimated Project Costs		\$262.84 per sf	\$3,950,513	\$259.71 per sf	\$3,903,420
Escalation Factor (6%)*			\$237,000.00		\$234,200
Total Estimated Project Costs w/ Escalation		\$278.61 per sf	\$4,187,513	\$275.29 per sf	\$4,137,620

* NOTE: The estimated project cost is based on 2017 cost data. Due to the recent and anticipated rise in construction material and labor costs, as well as the length of time before construction on this project begins, the Design Team recommends adding a 6% escalation factor to the EAC project budget.

In providing this opinion of probable cost, it must be understood that we have no control over costs or the price of labor, equipment or materials, contractors' methods of determining bid prices, competitive bidding, market or negotiating conditions. Accordingly, we cannot and do not warrant that bids or negotiated prices vary from our opinion. We make no warranty, express, or implied, as to the accuracy of any opinion we may give as compared to bid or actual cost.

Exclusions:

- Cost increase for phased construction during renovation
- No Public Roadway Improvements
- Rainwater Cisterns or Irrigation Equipment
- Stormwater Treatment or Detention Device
- Amenity Structures or Site Furniture
- Drainage Improvements in Street Rights of Way (Roof Drainage Only is Included)
- Livestock Paddock Fencing or Equipment
- New Domestic Water Service for the Building
- New Gas or Electric Services for the Building
- Special Gardening Features or Equipment
- Security or Decorative Fencing or Gates
- Site Lighting
- Landscaping Beyond Code Requirements
- New Project ID Sign at Street Frontage
- Public sidewalks along Revere Rd. and Old Cedar Grove Rd. add \$67,250
- Demonstration gardens add \$40,000
- Asbestos Abatement (add est. \$30,000 if required)

***Design Contingency:**

- Unforeseen building and site conditions
- Building systems (P, M, & E) contingency
- Structural systems contingency
- Site work contingency
- Any additional building components not yet designed
- Any additional programming not yet defined
- Specialty materials and finishes not yet defined

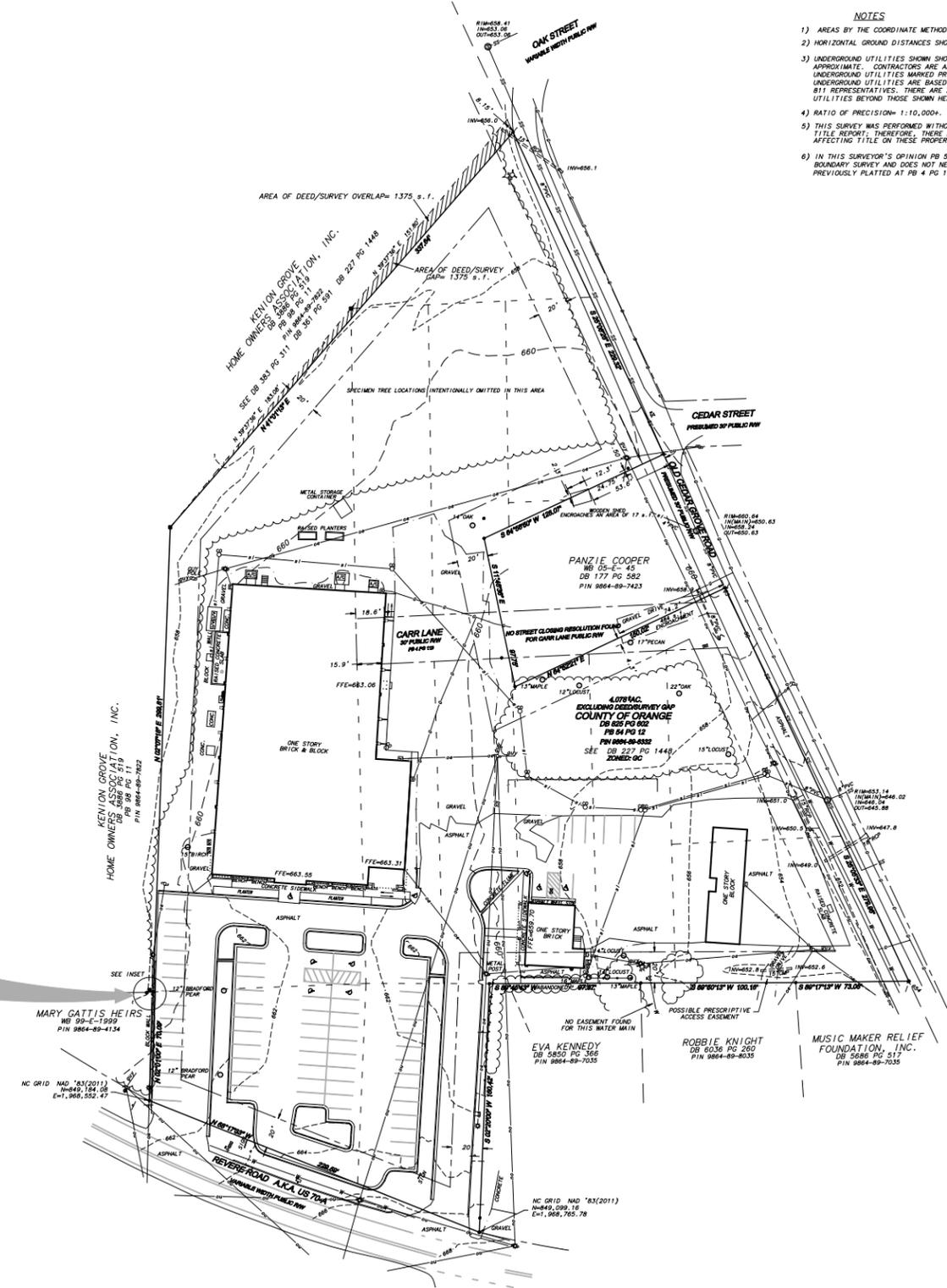
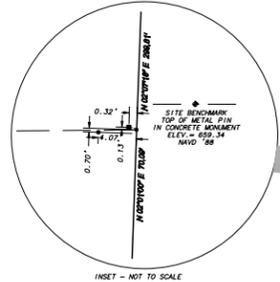
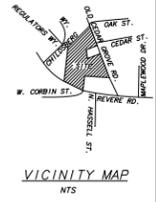
I, Phillip W. Riley, PLS, certify that this project was completed under my direct and responsible charge from an actual survey made under my supervision; that this ground survey was performed at the 95 percent confidence level (2 sigma) to meet Federal Geographic Data Committee Standards; that the horizontal accuracy is 1:10,000, that the vertical accuracy is 1:10,000 and that the original data was obtained on April 5, 2016; that the survey was completed on April 21, 2016; that contours shown meet the stated standard; and all coordinates are based on NAD 83(2011); and all elevations are based on NAVD 88(GEOID 12B).

Particulars:
 THE SURVEY CONTROL POINTS NOTED WERE DERIVED FROM GPS OBSERVATIONS BASED ON THE FOLLOWING:
 1) CLASS OF SURVEY: CLASS A
 2) POSITIONAL ACCURACY: MAXIMUM RESIDUAL 0.04 FT
 3) TYPE OF GPS FIELD PROCEDURE: RAPID STATIC
 4) DATE OF SURVEY: APRIL 5, 2016
 5) DATUM/EPOCH: NAD 83(2011) / 2010.0000
 6) PUBLISHED/FIXED CONTROL USED: NONE
 7) GEOID MODEL: GEOID 12B
 8) COMBINED GRID FACTOR: 0.9999105
 9) UNITS: US SURVEY FOOT
 10) GPS INSTRUMENTATION: TRIMBLE R8 GNSS

This document originally issued and sealed by Phillip W. Riley, L-3066, on April 21, 2016.
 This medium shall not be considered a certified document.

NC GRID NAD 83(2011)

- NOTES**
- 1) AREAS BY THE COORDINATE METHOD.
 - 2) HORIZONTAL GROUND DISTANCES SHOWN.
 - 3) UNDERGROUND UTILITIES SHOWN SHOULD BE CONSIDERED APPROXIMATE. CONTRACTORS ARE ADVISED TO HAVE ALL UNDERGROUND UTILITIES MARKED PRIOR TO ANY EXCAVATION. UNDERGROUND UTILITIES ARE BASED ON FIELD MARKINGS BY 811 REPRESENTATIVES. THERE ARE ADDITIONAL UNDERGROUND UTILITIES BEYOND THOSE SHOWN HEREON.
 - 4) RATIO OF PRECISION= 1:10,000.
 - 5) THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT; THEREFORE, THERE MAY BE ENCUMBRANCES AFFECTING TITLE ON THESE PROPERTIES NOT SHOWN HEREON.
 - 6) IN THIS SURVEYOR'S OPINION PG 54 PG 12 IS A PERMETER BOUNDARY SURVEY AND DOES NOT NECESSARILY RECOMBINE INTERIOR LOT LINES PREVIOUSLY PLATTED AT PG 4 PG 119 AND DEEDED IN DB 177 PG 580.



- LEGEND**
- EXISTING CONCRETE MONUMENT
 - ◆ EXISTING RAILROAD SPIKE
 - EXISTING IRON STAKE
 - EXISTING IRON PIPE
 - GAS METER
 - ELECTRIC METER
 - CLEAN OUT
 - END OF PIPE NOT FOUND/NOT SURVEYED
 - WATER METER
 - WATER VALVE
 - FIRE HYDRANT
 - LIGHT POLE
 - TELEPHONE PEDESTAL
 - SANITARY SEWER MANHOLE
 - UTILITY POLE
 - HANDICAP RAMP/PARKING SPACE
 - SIGN
 - ROOF DRAIN
 - CABLE TV BOX
 - REINFORCED CONCRETE PIPE
 - RAMP
 - DRAINAGE FLOW DIRECTION
 - WATER VALVE
 - SPECIMEN TREE
 - AIR CONDITIONING/HVAC UNIT
 - MAILBOX
 - UNDERGROUND GAS LINE (APPROXIMATE LOCATION-PARTIALLY MARKED)
 - OVERHEAD UTILITY LINE(S)
 - OVERHEAD ELECTRIC LINE(S)
 - SANITARY SEWER LATERAL (PRESUMED LOCATION)
 - SANITARY SEWER PIPE
 - WATER LINE (APPROXIMATE LOCATION-PARTIALLY MARKED)
 - UNDERGROUND FIBER OPTICS (NOT MARKED)
 - UNDERGROUND TV (NOT MARKED)
 - UNDERGROUND ELECTRIC (NOT MARKED)
 - UNDERGROUND TELEPHONE LINE(S) (NOT MARKED)
 - COY WIRE
 - ROOF LINE/OVERHANG
 - SPL IT RAIL FENCE
 - 4" WIRE FENCE
 - 6" CHAIN LINK FENCE
 - PUBLIC ROADWAY RIGHT OF WAY LIMITS
 - LOT LINE PLOTTED BY DEED - NOT SURVEYED
 - BUILDING SETBACK
 - PREVIOUS LOT LINES NOT RECOMBINED
 - EDGE OF GRAVEL
 - TREE LINE

BOUNDARY & TOPOGRAPHIC SURVEY
 PROPERTY OF
THE COUNTY OF ORANGE
 HILLSBOROUGH TOWNSHIP
 ORANGE COUNTY, NORTH CAROLINA

SCALE: 1" = 40'
 SCALE IN FEET
 APRIL 21, 2016

RILEY SURVEYING, P.A.
 3326 DURHAM CHAPEL HILL BLVD. STE B-100
 DURHAM, N.C. 27707
 919-667-0742 C-2881 phil@rileysurveyingpa.com

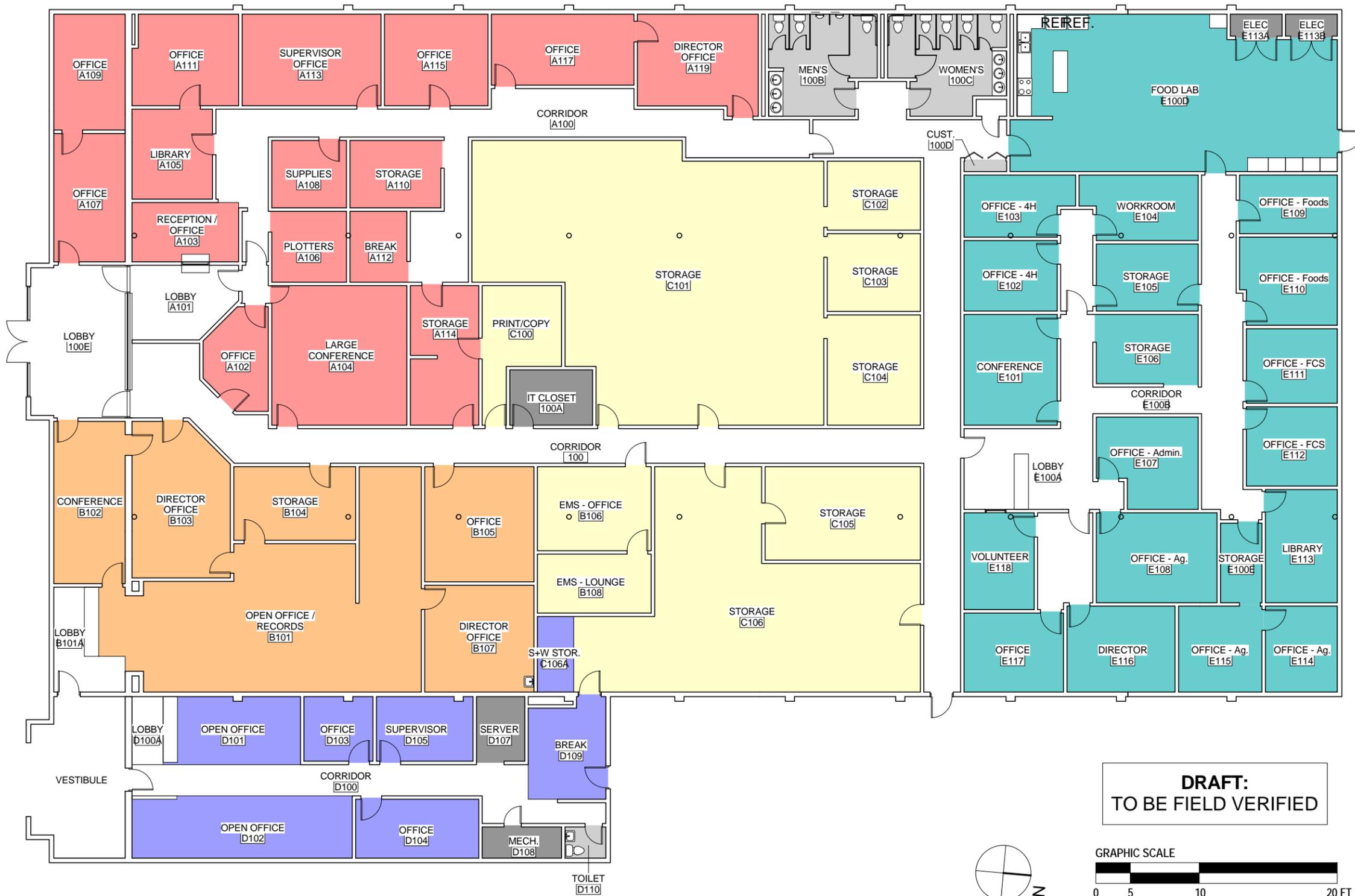


ORANGE COUNTY ENVIRONMENT & AGRICULTURAL CENTER
 01/12/17

EXISTING SITE SURVEY



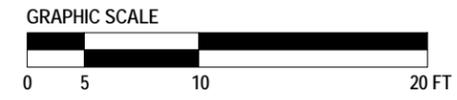
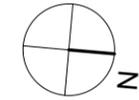
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LEGEND

- COUNTY SHARED STORAGE
- COOPERATIVE EXTENSION
- DEAPR
- SOIL & WATER
- FSA
- SERVICE AREA
- MECHANICAL/ELECTRICAL
- CIRCULATION

DRAFT:
TO BE FIELD VERIFIED





ORANGE COUNTY ENVIRONMENT & AGRICULTURAL CENTER
01/12/17

OPTION 1- MAJOR RENOVATION
CONCEPTUAL SITE PLAN





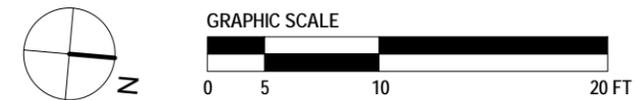
MAINTAIN MAIN BUILDING ENTRANCE IN SIMILAR LOCATION

LEGEND

NOTE: DEPARTMENTAL "HOT" STORAGE RESIDES WITHIN THE SUITE

- | | |
|---|---|
|  COOPERATIVE EXTENSION |  FOREST SERVICE |
|  DEAPR |  SHARED FACILITIES |
|  SOIL & WATER |  MECHANICAL/ELECTRICAL |
|  FSA |  CIRCULATION |

EXISTING FOOTPRINT SF: 20,692 GSF
 FULL INTERIOR RENO: 15,602 SF
 CORE AND SHELL: 5,090 SF



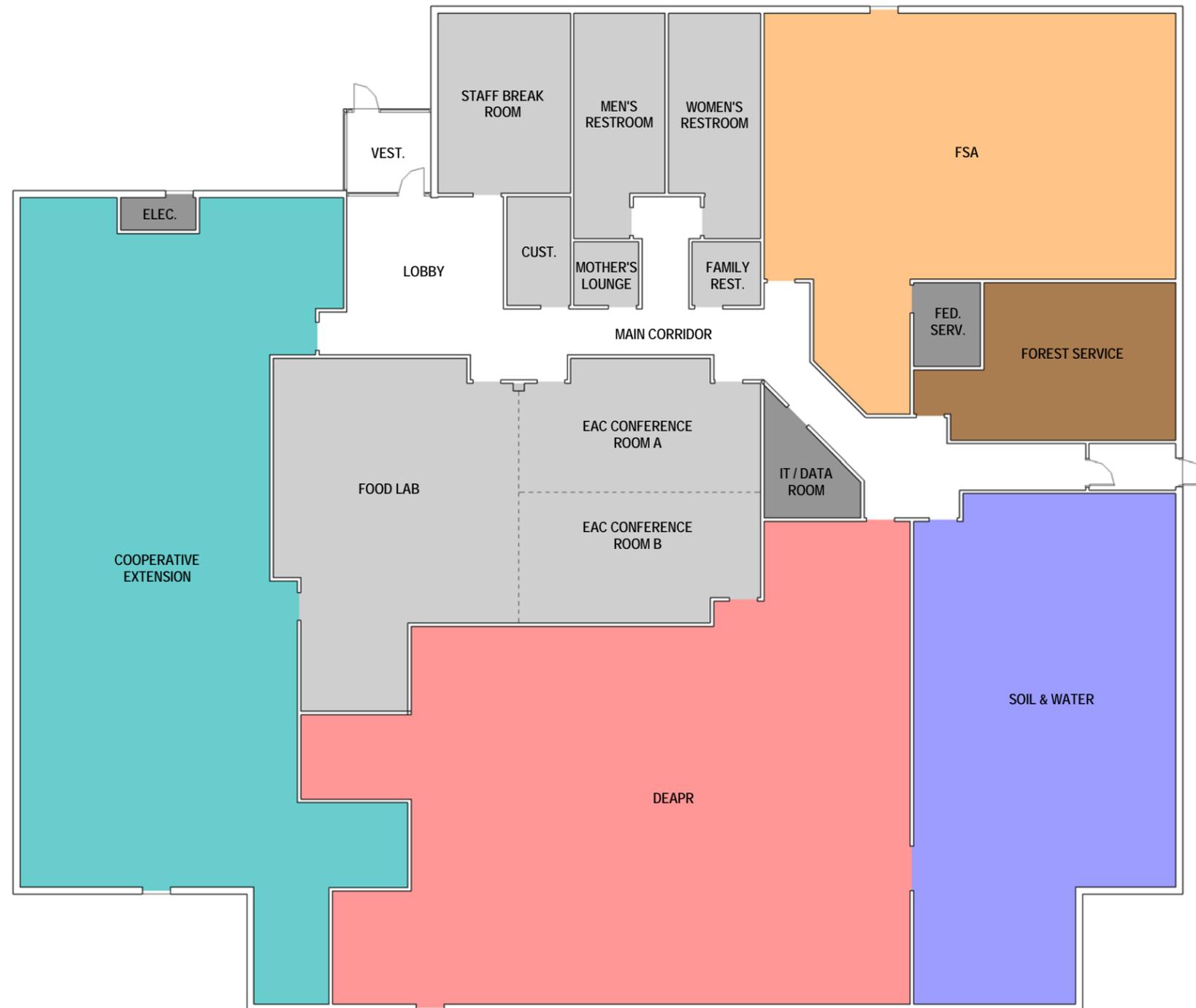
ORANGE COUNTY ENVIRONMENT & AGRICULTURAL CENTER
 01/12/17

OPTION 1 - MAJOR RENOVATION
 CONCEPTUAL PLAN
 1/16" = 1'-0"



©2016 HH ARCHITECTURE





NEW CONSTRUCTION SF: 15,030 GSF

LEGEND

NOTE: DEPARTMENTAL "HOT" STORAGE RESIDES WITHIN THE SUITE

- | | | | |
|---|-----------------------|---|-----------------------|
|  | COOPERATIVE EXTENSION |  | FOREST SERVICE |
|  | DEAPR |  | SHARED FACILITIES |
|  | SOIL & WATER |  | MECHANICAL/ELECTRICAL |
|  | FSA |  | CIRCULATION |

