



William Spry Agricultural Building Replacement Study

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Prepared for:
Utah Department of Agriculture and Food

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We extend our thanks to all others whose names are not listed here but whose involvement contributed to the development of this document.

ABOUT THE UTAH DEPARTMENT OF AGRICULTURE AND FOOD

The Department of Agriculture and Food is responsible for the administration of Utah’s agricultural laws, which mandate a wide variety of activities including inspection, regulation, information, rulemaking, loan issuance, marketing and development, pest and disease control, improving the economic position of agriculture, and consumer protection. To effectively do our work we need a facility that serves us by:

- Accommodating 84 meetings for Boards and Commissions with members of the public
- Providing easy access to Capitol Hill and staff collaboration with other Departments located near North Temple & Redwood Road
- Accommodate Department growth to meet needs of Wasatch Front growth



The Utah Department of Agriculture and Food logo

WILLIAM SPRY AGRICULTURE BUILDING EXISTING CONDITIONS

The Department of Agriculture and Food has occupied the William Spry Agriculture Building since its construction in 1980. The facility was completed just prior to a major revision to the building code, requiring buildings to meet much more stringent seismic construction requirements, particularly concerned with lateral reinforcement. The building’s unique tiered building design has led to deterioration of the concrete frame construction. This study summarizes the building’s existing condition as consisting of:

- Structural deficiencies
- Space deficiencies – building design does not provide for flexible office organization of office suites or flexible re-organization
- Thermal performance issues frequently invalidate testing results
- Lack of building-wide security
- Water leaks are troublesome to lab projects and building infrastructure and are costly to address
- Poor building ventilation systems re-circulates motor fuels lab odors
- Dearth of sound isolation which poses risk of sharing secure/private information
- Entry ramp does not meet ADA accessibility code

WHAT IS THE PURPOSE OF THIS STUDY

The purpose of the William Spry Agriculture Building Replacement Study is to understand and evaluate the existing building and assess its value. To establish an existing conditions assessment, upon which to base building re-use or demolition plans, the team utilized this study to analyze existing site conditions, space needs and growth projections. The team built upon these findings to craft base options for building replacement. Work included:

- Completed a Structural Evaluation and Building Performance (Tier 1) Seismic Study
- Conducted Site Analysis on the Redwood Road and Taylorsville sites to compare compatibility to Department needs
- Complete Geotechnical Analysis of soils condition on both sites

CONFIRMING THE CAPITAL BUDGET EXPENDITURE

Use of all of the afore noted materials were used to check construction cost and total project cost against a previously developed Capital Budget Estimate (CBE). In addition, work included:

Pre-Programming Study:

- Verified Space Needs at 56,500 GSF
- Managed Growth Projections to ensure planning for 30 years
- Confirmed Unique Project Requirements

Weights and Measures requirement for:

- Seismic Slab Isolation
- Lab Mechanical Systems

Dry Labs needs for:

- Ventilation and Services

Covered Parking / Storage to support:

- Equipment Access to Weights and Measures
- After hours Security Access to Building

STRUCTURAL DEFICIENCIES

A Tier 1 Seismic Evaluation was conducted in August 2015. Findings state: “The Utah Department of Agriculture (building) does not meet the Life Safety Performance Level for the enhanced hazard level. When a structure does not meet the Life Safety Level, structural elements may experience failure and/or collapse, and the overall risk of life-threatening injury as a result of primary structural damage is expected to be high.”

The following is a list of Potential Deficiencies identified for each area of the building during the Screening Phase (Tier 1) evaluation:

- Liquefaction - No specific reports of liquefaction, although US Geological Survey notes high liquefaction potential in this area.
- Overturning - Overturning forces may exceed the capacity of the soils, the foundation structure, or both.
- Shear Stress Check - Shear failures may occur before flexural failures. Shear failures tend to result in more instabilities of the structure than do flexural failures.
- Damage of Structural Members - Cracking and spalling of concrete exists, reflecting ongoing corrosion issues which may ultimately render the structure compromised.
- Unbraced Shear Walls - On the south side of the building, the concrete shear walls, which provide primary north-south lateral support, are not braced or supported on either side. During a seismic event, it is possible that the exposed ends of these walls may buckle and pose a life safety risk.



Deterioration of collector connections may result in the structure’s inability to transmit forces to the resisting structural elements.

CONCRETE DETERIORATION

The William Spry Building’s concrete frame construction has not held up well over the years, particularly its ability to shed moisture from exterior surfaces. The result is that:

- Water leaks are causing continued harm to building structure
- Cracking and spalling concrete reflects ongoing corrosion issues which may ultimately render the structure compromised
- The estimate to repair the extent of concrete deterioration and complete seismic upgrade is \$1.4 million



An example of concrete deterioration

SOUND ISOLATION

The William Spry Building's interior partition system has been constructed to allow for the flexibility. There are no fixed steel stud and gypsum board walls of typical commercial construction, but rather the consistent use of moveable / demountable partition walls. These walls frame all rooms on the interior of the building at 8' above finished floor. These partition walls are an inappropriate selection for this work space due to these factors:

- Internal wall system is consistently constructed of movable partitions, although flexible reuse or reconfiguration has not been accommodated
- Partitions do not extend above the ceiling system, thus provide very limited sound isolation
- In spaces where sound is amplified or secure information is being conveyed, partitions should extend to the structural deck and meet State Sound Transmission Criteria (STC) ratings

DFCM Design Requirements, dated 02.02.15 establish standards for Acoustical Quality, which should be used in designing new space, and include:

(1) When possible, design spaces in accordance with following minimum requirements for "Privacy."

Privacy Space

Category Measured	NIC Rating
Confidential with high voice levels	58-60+
Confidential with slightly raised voice levels	52-58
Confidential with normal voice levels	50-52
Confidential with lowered voice levels	45-50

(2) Design spaces in accordance with the following minimum requirements for "Ambient Background Noise."

Ambient Background Noise

Space Category	Measured NC Rating
Critical Performing Spaces	<20
Performing Spaces, Courtrooms, Executive Offices	20-30
Sleeping, resting, or relaxing spaces	25-35
Private offices, sm. conf. rms, classrooms, libraries	30 -35
Open offices, reception areas, cafeterias, gymnasiums	35-40
Lobbies, laboratories, maintenance shops	40 -45
Kitchens, industrial shops, equipment rooms	45-55



Important rooms - such as the Commissioner's Conference Room - are constructed of movable partition walls and do not provide the necessary acoustic isolation required.

SPACE NEEDS

CRSA completed both an existing conditions space analysis and a proposed space needs analysis to establish a base building size to meet the needs of the Department in 2045. The Department of Agriculture and Food consists of seven primary divisions, each with particular space needs. In general, the department space requirements consist mostly of open and closed offices, administration and support spaces, spaces to support meetings with internal teams and large public meetings. In addition, there are very specific space needs in the Division of Regulatory Services: Food, Dairy and Bedding. In particular, the Motor Fuels Testing Lab requires space separation, lab quality mechanical systems and independent ventilation requirements and the Weights & Measures Lab requires slab isolation and vibration controlling construction measures. With these details in mind, the project was able to confirm the CBE space request of 56,500 gross square feet (GSF) to accommodate 2045 space requirements. Independent cost estimators established Project Construction Estimate at \$28,322,650.

SUMMARY OF SPACES			56,500	gsf	%*	\$	355 ave./gsf
1	ADMINISTRATION	4,800	7,920	14%	\$	350	
2	ADMINISTRATIVE SERVICES	3,445	5,684	10%	\$	350	
3	COMMUNICATIONS	270	446	1%	\$	350	
4	ANIMAL INDUSTRY / MEAT INSPECTION	3,910	6,452	11%	\$	350	
5	PLANT INDUSTRY	7,380	12,177	22%	\$	350	
6	REGULATORY SERVICES: FOOD, DAIRY, AND BEDDING	13,267	21,891	39%	\$	362	
7	MARKETING & ECONOMIC DEVELOPMENT	1,170	1,931	3%	\$	350	
8	BUILDING SERVICES*		3,570				
		*NIC in total GSF	5,891				

)* Percentage of building occupation

FUTURE GROWTH

The State of Utah recently welcomed its three millionth resident, and current projections indicate that the population of Utah will likely double by 2050. In order to meet this demand, the Utah Department of Agriculture and Food will need to increase its staff significantly – up to as many as 84 new employees - to continue providing the regulatory and administrative services to the state. As population growth is primarily focused along the Wasatch Front, in or near Salt Lake City, growth and the office location for staff will mirror this trend. The breakdown below provides a glimpse into what this might look like based on the three largest divisions in the Department of Agriculture.

Plant Industry

The Division of Plant Industry “is responsible for ensuring consumers of disease free and pest free plants, grains, and seeds, as well as properly labeled agricultural commodities, and the safe application of pesticides and farm chemicals.” Sixteen investigation staff are currently employed, and this number may need to double to meet the growing need. The new employees would be shared equally between new pesticide investigators and compliance specialists.

Regulatory Services

The Division of Regulatory Services “has regulatory oversight of products in the areas of food, weights and measures, dairy and bedding, upholstered furniture and quilted clothing.” Currently a team of 65 employees meet this need including managers, staff, and part time employees. Their responsibilities include inspection of over 8,000 establishments, 206 farms, 23 manufacturing plants, as well as managing over 4,000 licenses. In order to meet this need in the future over 50 new employees may be needed including a new deputy director, managers and staff.

Animal Industry

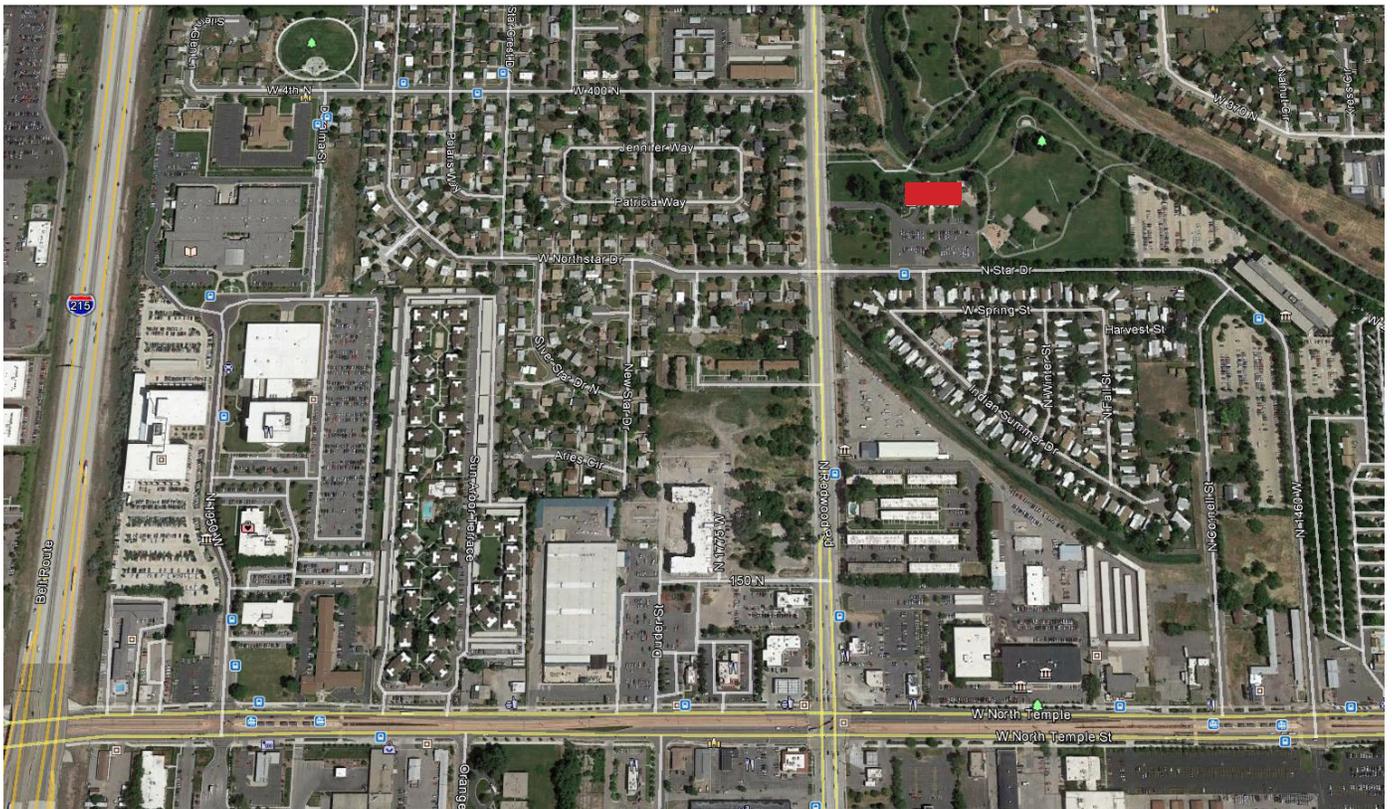
The Division of Animal Industry has a diverse mission with six different programs. Their goals include: “the prevention and control of animal diseases; assuring wholesome products for consumers; offering protection to the livestock industry; protecting fish health in the state; protecting Utah’s wild elk population; and disease diagnosis and surveillance.” Currently UDAF Animal Industry Division has 115 total positions, and will likely need 24 new employees including inspectors and veterinarians in order to continue providing the same level of service to a larger population.

05 SITE SELECTION

DRIVERS FOR THE IDEAL SITE

Department of Agriculture and Food needs:

- Public Interface
- Flexibility of Space
- Proximity to Departments of Natural Resources, Environmental Quality, and Human Resource Management



Bird's eye view of the current vicinity of the Utah Department of Agriculture and Food

PLANNING FOR A NEW BUILDING

During the process of developing this document, the Pre-Programming team thoroughly reviewed:

- Existing Building Conditions
- Space Needs and Growth Strategies
- Structural Report
- ADA and Code Compliance
- Meet State of Utah Office Standards
- Two Potential Sites – Redwood Road & Taylorsville



Site access via Redwood Road and North Star Drive



The entrance of the William Spry Agriculture and Food building

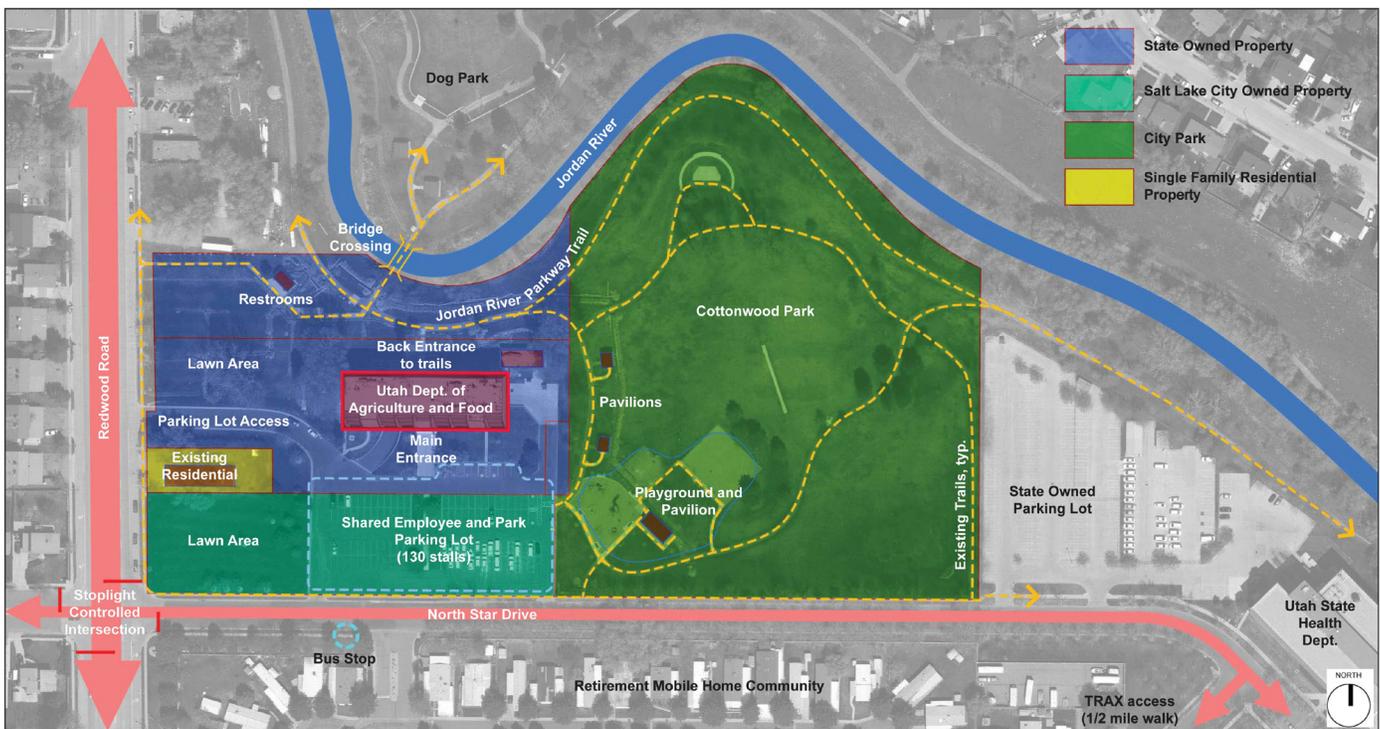
05 SITE SELECTION

SITE 1 - REDWOOD ROAD EXISTING CONDITIONS

The existing location of the Department of Agriculture is at 350 North Redwood Road. Located in Salt Lake City, this site meets many of the site selection requirements, including:

- Ease of access to Capitol Hill
- Public interface with adjacent and abundant parking
- Proximity to Departments of Natural Resources, Environmental Quality, and Human Resource Management and
- Can accommodate a building design that provides flexibility of space within the current site.

The site is currently adjacent to a public park. A land swap may clarify parking allocation. A small, single family resident is located on the site. Acquisition and demolition are included in the project budget and will thus not serve as a deterrent to development.

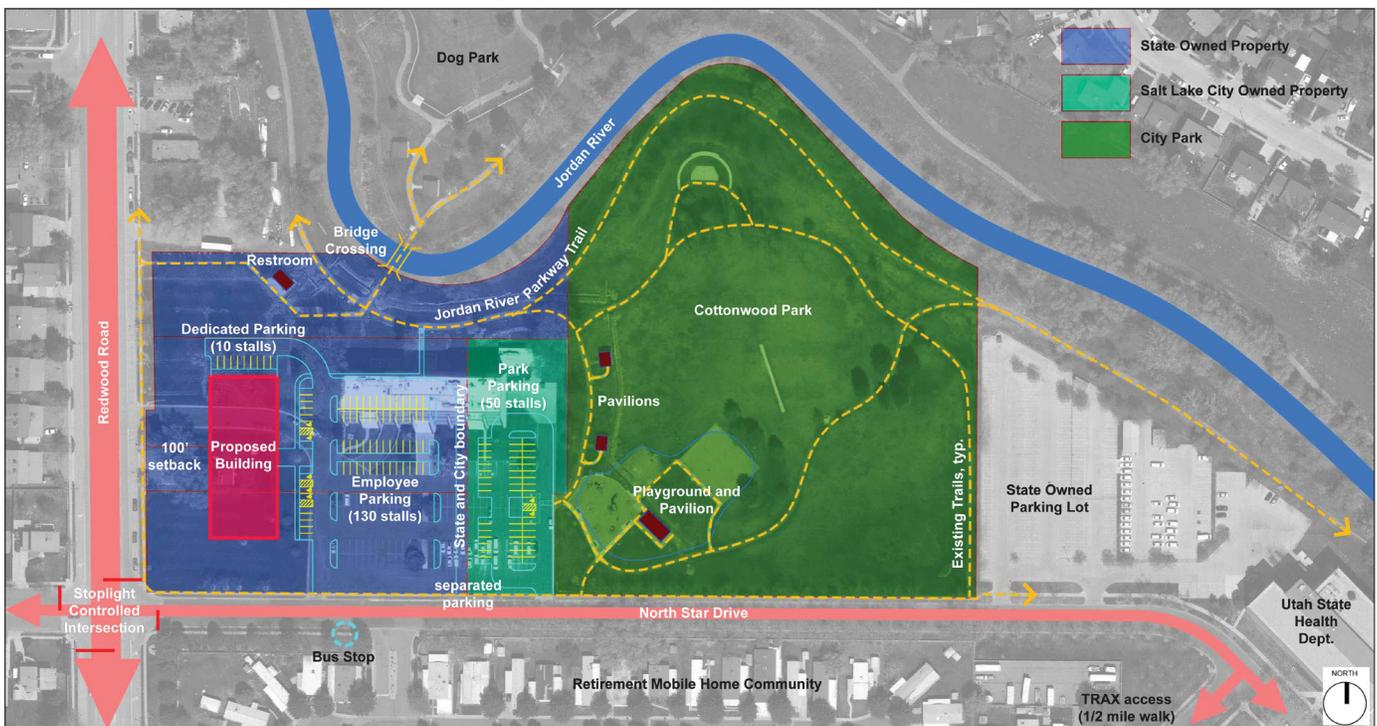


05 SITE SELECTION

SITE 1 - REDWOOD ROAD PROPOSED PLAN

The Redwood Road and North Star Drive site consists of a large parcel immediately west of Cottonwood Park and south of the Jordan River. The site, just over five acres, will accommodate the construction of a replacement facility while the existing William Spry Building remains on site. The site development plan, below, illustrates the possible placement of a new Department of Agriculture facility, adjacent, dedicated parking of 130 stalls and a separated lot configuration to accommodate 50 stalls of parking for the public park.

The site provides ease access to public transportation along Redwood Road and North Temple. The existing Jordan River Parkway Trail and park amenities will remain on the State's property.



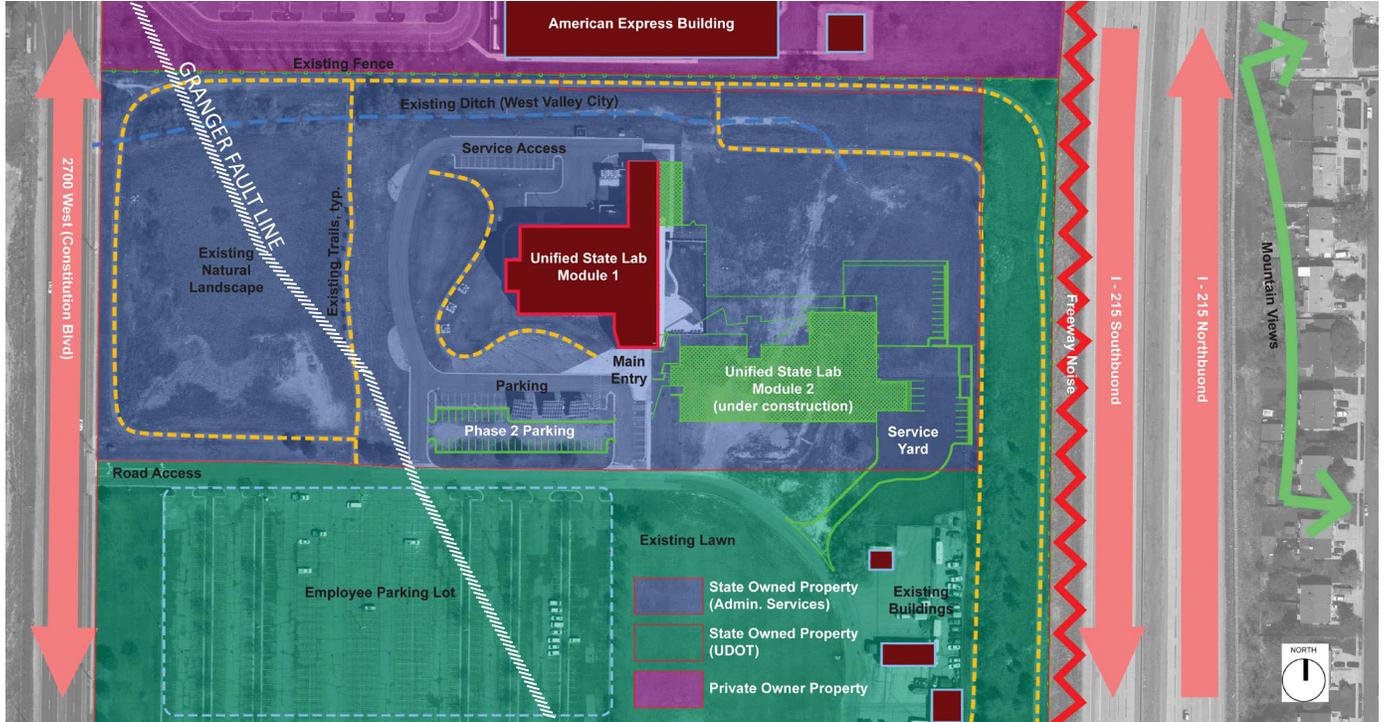
05 SITE SELECTION

SITE 2 - UNIFIED STATE LAB CAMPUS EXISTING CONDITIONS

A development opportunity exists at the State Unified State Laboratory site in Taylorsville, Utah. The site was suggested for review by the Utah State Building Board for its potential proximity to Department of Agriculture and Foods labs to be located in Module 2, currently under construction. The remaining developable site is east of Module 1 and immediately north of Module 2. Site encumbrances include an existing stormwater ditch associated with West Valley City. This flow could be held in a new detention basin west of Module 1 or culverted along the north property boundary allowing for drainage into the I-215 stormwater collection basin to the west of I-215.



Module 1 to left and Module 2 to right, site beyond

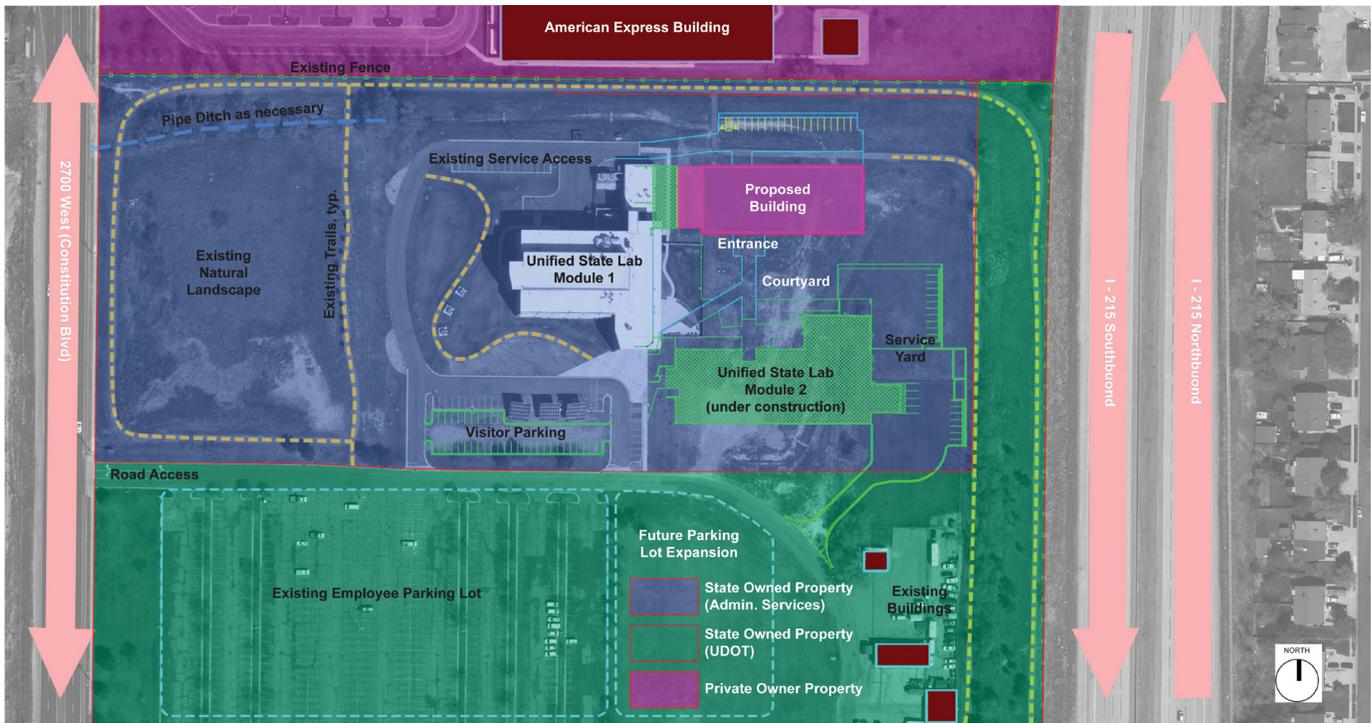


USL Campus Existing Conditions Analysis

05 SITE SELECTION

SITE 2 - UNIFIED STATE LAB CAMPUS PROPOSED PLAN

The proposed location for a building to accommodate the Department of Agriculture and Foods is illustrated below. The building would abut Module 1 and share expanded central plant facilities at the northeast corner of Module 1. Primary public access is from the southwest as visitor and staff parking is located south of Module 1. Pedestrian circulation to the building is planned to be accommodated in the developed plaza area between Modules 1 and 2 and the new building. This creates a difficult to locate and very long walk for visitors. Distant parking coupled with the poor visual access to the new building from the access road is a concern for the development on this available site. Other concerning factors include the limited access north of the new building site and NIST Standards for Metrology highly suggesting that newly developed facilities should not be developed adjacent to “heavily traveled highways”.



USL Campus Proposed Site Plan

SITE 1 - REDWOOD ROAD CONCEPT DESIGN

PROS

- Adjacent to DNR, DEQ, DHRM
- Access to Capitol Hill
- Access to public transportation
- Ease of construction phasing and moving on existing site
- Ease of public parking and site access

CONS

- Poor soils on site
- Security concerns of neighborhood



Bird's eye graphic depiction of the concept design for Site 1 Redwood Road

SITE 1 - REDWOOD ROAD
CONCEPT DESIGN



Redwood Road Campus Proposed Conceptual Design



Redwood Road Campus Proposed Conceptual Floor Plan- Level One

SITE 2 - UNIFIED STATE LABS CAMPUS CONCEPT DESIGN

PROS

- Adjacent to Department of Agriculture & Foods Labs in Module 2

CONS

- Limits potential growth needed by Module 1 & 2 programs, including State Medical Examiners Office
- Poor soils on site
- Limited public access – visual access and parking adjacent to building
- Distance from State Capital
- NIST Standards for Metrology state these facilities should not be adjacent to “heavily traveled highways”



Bird's eye graphic depiction of the concept design for Site 2 Unified State Labs Campus

**SITE 2 - UNIFIED STATE LABS CAMPUS
CONCEPT DESIGN**

Interaction with the public will be difficult if the Agricultural Building is replaced at the Unified State Labs Campus due to limited site visibility and pedestrian access.

FUNDING REQUEST

The Department of Agriculture and Food original funding request was validated through the Building Replacement Study, which included review of estimated construction and site development costs included in the CBE. Following the development of conceptual floor plans and renderings, review of geotechnical findings and the structure building evaluation report, the planning team utilized a professional cost estimator to understand projected total project cost. Modifications to building construction and site development costs impacted the original request. The CBE was updated with a total funding request of \$28,322,650 for design and construction of a new Department of Agriculture and Foods Building.

This funding request covers the estimated construction budget and appropriate soft costs for both the Redwood Road and Taylorsville sites. Poor soils conditions with poor bearing capacity and the chance for liquefaction exist at both locations. The estimate included in this document covers these eventualities.

SCHEDULE

The funding request for the Department of Agriculture and Foods Replacement Building is progressing through the legislative approvals process, which will not be completed until Spring 2016. If the project receives funding in Spring 2016 a project design and construction schedule that runs the design phase from April thru December 2016 followed subsequently by building construction from February 2017 to February 2018.

A1 APPENDIX 1 - CURRENT SPACE SUMMARY

Department of Agriculture and Food

Space Summary

AREA	DESCRIPTION	PROP QTY	NASF	GASF	TOTAL NET SF	TOTAL GROSS SF
ENTIRE PROGRAM					34,205	56,438
1	ADMINISTRATION				4,800	7,920
1.1	Entry				820	1,353
1.1.1	Vestibule	1	200	330	200	330
1.1.2	Lobby/Lounge	1	500	825	500	825
1.1.3	Reception Desk	1	120	198	120	198
1.2	Executive Office				1,280	2,112
1.2.1	Commissioner	1	240	396	240	396
1.2.2	Deputy Commissioner	2	160	264	320	528
1.2.3	Executive Assistant	1	120	198	120	198
1.2.4	Senior Policy Analyst	1	120	198	120	198
1.2.5	Policy Analyst	1	120	198	120	198
1.2.6	Homeland Security	1	120	198	120	198
1.2.7	Human Resources	1	120	198	120	198
1.2.8	Risk Management	1	120	198	120	198
1.3	Support				2,700	4,455
1.3.3	Conference Room - Large	2	1,000	1,650	2,000	3,300
1.3.4	Catering Prep Lunch Room	1	500	825	500	825
1.3.5	Supply	1	200	330	200	330
2	ADMINISTRATIVE SERVICES				3,445	5,684
2.1	Staff				2,310	3,812
2.1.1	Director of Administrative Services	1	150	248	150	248
2.1.2	Financial Analyst	4	120	198	480	792
2.1.3	Budget Officer Admin	1	120	198	120	198
2.1.4	Accounting Tech / Reception	1	80	132	80	132
2.1.5	Accounting	1	120	198	120	198
2.1.6	Accounting Tech / AM Reception	1	80	132	80	132
2.1.7	Recorder desk	1	80	132	80	132
2.1.8	GIS Program Analyst	1	80	132	80	132
2.1.9	HR Analyst	1	120	198	120	198
2.1.10	IT Manager	1	120	198	120	198
2.1.11	Administrative Services Work Area	1	800	1,320	800	1,320
2.1.12	Intern	1	80	132	80	132
2.2	Support				1,135	1,873
2.2.1	Conference Room -Medium	1	550	908	550	908
2.2.2	Computer Programming	1	325	536	325	536
2.2.4	Printer Room	1	80	132	80	132
2.2.5	Copy Mail room	1	180	297	180	297

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APPENDIX 1 - CURRENT SPACE SUMMARY

AREA	DESCRIPTION	PROP QTY	NASF	GASF	TOTAL NET SF	TOTAL GROSS SF
3	COMMUNICATIONS				270	446
3.1	Staff				270	446
3.1.1	Communications Director	1	150	248	150	248
3.1.2	Information Specialist	1	120	198	120	198
4	ANIMAL INDUSTRY / MEAT INSPECTION				3,910	6,452
4.1	Staff				1,140	1,881
4.1.1	Animal Industry Director	1	150	248	150	248
4.1.2	Deputy Chief Livestock	1	150	248	150	248
4.1.3	State Veterinarian	1	120	198	120	198
4.1.4	Secretary Chem. Lab / Meat	1	120	198	120	198
4.1.5	Brand Inspection Manager	1	120	198	120	198
4.1.6	Brand Recorder	1	120	198	120	198
4.1.7	Field Veterinarian	3	120	198	360	594
4.2	Meat Inspection				600	990
4.2.1	Manager	1	120	198	120	198
4.2.2	Assistant Manager	1	120	198	120	198
4.2.3	Office Tech - Animal	2	120	198	240	396
4.2.4	Entry Permit - Office Tech	1	120	198	120	198
4.3	Aquaculture				120	198
4.3.1	Aquaculture Manager	1	120	198	120	198
4.4	Support				890	1,469
4.4.1	Animal Lab	1	120	198	120	198
4.4.2	Copy Mail room	1	120	198	120	198
4.4.3	Conference room	1	250	413	250	413
4.4.4	Cooler	1	100	165	100	165
4.4.5	Utility Tools	1	120	198	120	198
4.4.6	Departmental Storage	1	180	297	180	297
4.5	Future Growth				1,160	1,914
4.5.1	Staff					
4.5.1a	Meat Inspector	6	80	132	480	792
4.5.1b	Veterinarian	3	120	198	360	594
4.5.1c	Livestock Inspector	4	80	132	320	528

A1

APPENDIX 1 - CURRENT SPACE SUMMARY

AREA	DESCRIPTION	PROP QTY	NASF	GASF	TOTAL NET SF	TOTAL GROSS SF
5	PLANT INDUSTRY				7,380	12,177
5.1	Staff				570	941
5.1.1	Division Director	1	150	248	150	248
5.1.2	Deputy Director	2	150	248	300	495
5.1.3	Executive Secretary	1	120	198	120	198
5.2	Regulatory				1,080	1,782
5.2.1	Seed, Feed, & Fertilizer Manager	1	120	198	120	198
5.2.2	Insect Infestation Manager	1	120	198	120	198
5.2.3	Insect Technician	3	120	162	360	594
5.2.4	Pesticide Program Manager	1	120	162	120	198
5.2.5	Office Technician - Pesticide Reg.	1	120	162	120	198
5.2.6	Office Technician - Plant	1	120	162	120	198
5.2.7	Office Technician - Organic	1	120	162	120	198
5.3	Conservation				360	594
5.3.1	Salinity Manager	1	120	198	120	198
5.3.2	Grazing Improvement Program Manager	1	120	198	120	198
5.3.3	Invasive Species Mitigation Manager	1	120	198	120	198
5.4	Utah Conservation Commission				1,440	2,376
5.4.1	Staff					
5.4.1.a	Utah Conservation Commission Specialist	1	120	198	120	198
5.4.1.a	Seed Analyst	3	120	198	360	594
5.4.1.a	Environmental Scientist	1	120	198	120	198
5.4.1.a	Water Quality Specialist	1	120	198	120	198
5.4.1.a	Grazing Rangeland Biologist	1	120	198	120	198
5.4.1.a	Trapping Coordinator	1	120	198	120	198
5.4.2	Loan Administration					
5.4.2.a	ARDL Loan Specialist	2	120	198	240	396
5.4.2.a	ARDL Loans Analyst	1	120	198	120	198
5.4.2.a	ARDL Account Technician	1	120	198	120	198
5.5	Labs				1,270	2,096
5.5.1	Insect Lab	1	200	162	200	330
5.5.2	Germination Lab	1	350	162	350	578
5.5.3	Seed Lab	1	300	162	300	495
5.5.4	Seed Lab & Equipment Storage	1	300	162	300	495
5.5.5	Seed storage	1	120	198	120	198
5.6	Support				820	1,353
5.6.1	Conference Room - Small	2	250	413	500	825
5.6.2	Storage - Small	1	200	330	200	330
5.6.3	Copy Mail room	1	120	198	120	198
5.7	Future Growth				1,840	3,036
5.7.1	Staff					
5.7.1a	Pesticide Investigators	10	120	198	1,200	1,980
5.7.1a	Compliance Specialist	8	80	132	640	1,056

A1

APPENDIX 1 - CURRENT SPACE SUMMARY

AREA	DESCRIPTION	PROP QTY	NASF	GASF	TOTAL NET SF	TOTAL GROSS SF
6	REGULATORY SERVICES: FOOD, DAIRY, AND BEDDING				12,990	21,434
6.1	Staff				2,550	4,208
6.1.1	Director of Regulatory Services	1	150	248	150	248
6.1.2	Executive Secretary	1	120	198	120	198
6.1.3	Weights & Measures Manager	1	120	198	120	198
6.1.4	Weights & Measures Inspector	1	120	198	120	198
6.1.5	Manufactured Food RPS Program Manager	1	120	198	120	198
6.1.6	Office Specialist Regulatory	1	120	198	120	198
6.1.7	Motor Fuel Tech	1	120	198	120	198
6.1.8	Cottage Food / Labeling	1	120	198	120	198
6.1.9	Dairy Inspection Supervisor	1	120	198	120	198
6.1.10	Egg & Poultry Supervisor	1	120	198	120	198
6.1.11	Food Inspection Supervisor	1	120	198	120	198
6.1.12	Food Inspector	1	120	198	120	198
6.1.13	Bedding Program Manager	1	120	198	120	198
6.1.14	Bedding Program	1	120	198	120	198
6.1.15	Compliance Specialist	4	120	198	480	792
6.1.16	Registration Specialist	1	120	198	120	198
6.1.17	Metrologist	2	120	198	240	396
6.2	Lab				1,650	2,723
6.2.1	Motor Fuels Testing	1	650	1,073	650	1,073
6.2.2	Testing Room	1	250	413	250	413
6.2.3	Vol Lab	1	250	413	250	413
6.2.4	Prover	1	150	248	150	248
6.2.5	Small Mass Lab	1	350	578	350	578
6.3	Support				1,190	1,964
6.3.1	Shop	1	250	413	250	413
6.3.2	Paint Room	1	120	198	120	198
6.3.3	Records Storage	1	120	198	120	198
6.3.4	Library	1	250	413	250	413
6.3.5	Conference Room - Small	1	250	413	250	413
6.3.6	Storage - Large	1	200	330	200	330
6.4	Future Growth				7,600	12,540
6.4.1	Food & Dairy					
6.4.1a	Food & Dairy Manager	4	120	198	480	792
6.4.1a	Food & Dairy Employee	24	80	132	1,920	3,168
6.4.2	Weights & Measures					
6.4.2a	Weights & Measures Manager	4	120	198	480	792
6.4.2a	Weights & Measures Employee	24	80	132	1,920	3,168

A1

APPENDIX 1 - CURRENT SPACE SUMMARY

AREA	DESCRIPTION	PROP QTY	NASF	GASF	TOTAL NET SF	TOTAL GROSS SF
6.4.3	Bedding & Upholstery					
6.4.3a	Bedding & Upholstery Manager	2	120	198	240	396
6.4.3a	Bedding & Upholstery Employee	6	80	132	480	792
6.4.4	Egg & Poultry					
6.4.4a	Egg & Poultry Full-time Employee	6	120	198	720	1,188
6.4.5	Staff					
6.4.5a	Deputy Director	1	120	198	120	198
6.4.5b	Secretarial Staff	8	80	132	640	1,056
6.4.5c	Open Work Area for Workstations	1	600	990	600	990
7	MARKETING & ECONOMIC DEVELOPMENT				1,290	2,129
7.1	Staff				550	908
7.1.1	Marketing Director	1	150	248	150	248
7.1.2	Deputy Marketing Director	1	120	198	120	198
7.1.3	Utah's Own Social Media Specialist	1	120	198	120	198
7.1.4	Marketing Division Interns	2	80	132	160	264
7.2	Support				300	495
7.2.1	Conference Room - Small	1	150	248	150	248
7.2.2	Storage	1	150	248	150	248
7.3	Future Growth				440	726
7.3.1	Staff					
7.3.1a	Marketing Staff Member	2	120	198	240	396
7.3.1b	Marketing Intern	1	80	132	80	132
8	WILDLIFE SERVICES (PREDATOR)				120	198
8.1	Staff				120	198
8.1.1	Wildlife Services Director	1	120	198	120	198
9	BUILDING SERVICES*				3,570	5,891
9.1	Mechanical / Electrical / Communications				2,870	4,736
9.1.1	Electrical / Telecommunications Room	1	150	248	150	248
9.1.2	Mechanical	1	1,500	2,475	1,500	2,475
9.1.3	Server Room	1	300	495	300	495
9.1.4	Restrooms (Men's & Women's on multiple levels)	3	250	413	750	1,238
9.1.5	Showers	1	50	83	50	83
9.1.6	Exercise Room	1	120	198	120	198
9.2	Support				700	1,155
9.2.1	Building Storage	1	350	578	350	578
9.2.2	Custodial Closet	3	50	83	150	248
9.2.3	Receiving	1	200	330	200	330
9.2.4	Covered Parking	1	-	-	-	-
* Not included as net square footage						
TOTAL ASSIGNABLE SPACE					34,205	56,438

Department of Agriculture & Food - NIST Metrology Lab

Parametrix - Program Construction Cost Estimate

Description	GSF Area	UOM	Unit Cost	COST	
BUILDING:					
1 - Administration	7,920	GSF	\$285.00	\$2,257,000	
2 - Administrative Services	5,684	GSF	\$285.00	\$1,620,000	
3 - Communications	446	GSF	\$300.00	\$134,000	
4 - Animal Industry / Meat Inspection	6,452	GSF	\$355.00	\$2,290,000	
5 - Plant Industry	12,177	GSF	\$355.00	\$4,323,000	
6 - Regulatory Services: Food, Dairy & Bedding	21,434	GSF	\$355.00	\$7,609,000	
7 - Marketing & Economic Development	2,129	GSF	\$285.00	\$607,000	
8 - Wildlife Services (Predator)	198	GSF	\$285.00	\$56,000	
9 - Building Services (Included in GSF Calculation)					
SUB-TOTAL (Building)	56,440	GSF	\$335.00	\$18,896,000	
SITE IMPROVEMENTS:					
Paving / Walks	54,500	SF	\$10.00	\$545,000	
Landscaping	54,500	SF	\$5.00	\$273,000	
Site Utilities / Site Lighting	1	LS	\$300,000	\$300,000	
SUB-TOTAL (Site Improvements)	109,000	SF	\$10.00	\$1,118,000	
SUB-TOTAL (Building & Site)	56,440	GSF	\$355.00	\$20,014,000	
INFLATION TO SUMMER 2016 (Allow)	3.0%	56,440	GSF	\$10.00	\$600,420
TOTAL	56,440	GSF	\$365.00	\$20,614,420	

NOTES: Costs are for Construction Only.
 Costs are Based on an Open Competitive Bid Basis.
 Costs Include Contractor Mark-ups.
 Costs are Based on a Construction Start of Summer 2016.

MEMORANDUM**To:** Ryan Wallace - CRSA**Job No.** 0128-016-07**From:** Alan Spilker**Date:** October 27, 2015**Subject:** Preliminary Geotechnical Profile
Department of Agriculture and Food
Proposed Redwood Road Structures

Based on soil data from the site and other nearby sites, GSH Geotechnical, Inc. (GSH) can provide the following preliminary soils information:

Non-engineered fills are found on most sites across the Salt Lake Valley. For this site, we would anticipate that there will be less than 2 feet of fills. These fills will likely need to be removed under footings but may remain in floor slab areas if properly prepared (scarified to 9 inches and compacted).

Silty clay soils will likely be encountered from the surface or underneath the fills and will likely extend to depths of 30 to 45 feet. Within the clay soils, layers up to 5 feet thick of silty fine sand will likely be encountered. The clay soils are relatively good (stiff and very stiff) to a depth of approximately 10 feet where the clays become medium stiff to soft. The sandy soils are typically medium dense in this area. These soils will likely support up to 7 kips per foot wall loads and 150 kip column loads at a bearing capacity of approximately 2,000 pounds per square foot. Heavier loads will likely require some replacement fills underneath footings. We anticipate that a Site Class D may be used for seismic design.

The site is located in an area that has been mapped by Salt Lake County as having a “high liquefaction potential.” Liquefaction is defined as the condition when saturated, loose, fine sand-type soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will not liquefy during a major seismic event. Although liquefaction was not encountered within previously studied sites in the vicinity, liquefaction is variable in the area and potentially could be encountered at this location. Due to the proximity of the Jordan River to the site, if liquefaction is encountered, a potential for lateral spread would also be present.

Other soil problems, such as expansive and collapsible soils, are not anticipated to be encountered at the site.

Groundwater is anticipated to be encountered at depths more than 7.5 feet below the existing ground surface and will not likely affect the proposed construction unless a basement is proposed.

Memorandum
Preliminary Geotechnical Profile
October 27, 2015



If you have any questions or would like to discuss these items further, please feel free to contact us at (801) 685-9190.

Respectfully submitted,

GSH Geotechnical, Inc.

A handwritten signature in blue ink that reads "Alan D. Spilker".

Alan D. Spilker, P.E.
State of Utah No. 334228
President/Senior Geotechnical Engineer

ADS;jlh

Addressee (email)

cc: Mr. Fernando Pitone (email)
CRSA

STRUCTURAL EVALUATION REPORT BY REAVELEY ENGINEERS & ASSOCIATES

**Utah Department of Agriculture and Food Building
Structural Evaluation Report**

350 North Redwood Road
Salt Lake City, UT 84116

675 East 500 South, Suite 400
Salt Lake City, Utah 84102
ph.801.486.3883 | fax.801.485.0911



Prepared by:

REAVELEY
ENGINEERS + ASSOCIATES
Consulting Structural Engineers

EXECUTIVE SUMMARY

This evaluation assesses the seismic performance of the Utah Department of Agriculture and Food building to meet the Basic Performance Objective for Existing Buildings (BPOE) with an enhanced hazard level. The BPOE accepts a lower level of safety and a higher risk of collapse than would be provided by similar standards for new buildings. Buildings meeting the BPOE are expected to experience little damage from relatively frequent, moderate earthquakes but significantly more damage and potential economic loss from the most severe and infrequent earthquakes.

A Seismic Evaluation per ASCE 41, *Seismic Evaluation and Retrofit of Existing Buildings*, (Tier I) has been completed for this building. The building has been evaluated for seismic performance in accordance with the Life Safety Performance Level. The Life Safety Performance Level is defined as the level of seismic event in which structural components are expected to maintain a margin of safety against failure and/or collapse, and the overall risk of life-threatening injury as a result of primary structural damage is expected to be relatively low.

INFORMATION AND FINDINGS

The Utah Department of Agriculture and Food building was constructed in 1980. The structural system of the building is comprised of precast concrete double tees and a concrete building frame for gravity support. The lateral support for the building is provided by conventionally reinforced concrete shear walls.

DEFICIENCIES

The evaluation identified the following major building deficiencies in the building:

1. High liquefaction potential.
2. Overturning at shear walls
3. Inadequate roof diaphragms.
4. Inadequate connections between the diaphragms and the shear walls.
5. Inadequate shear wall strength.

CONCLUSION

The Utah Department of Agriculture and Food building does not meet the Life Safety Performance Level for the enhanced hazard level. When a structure does not meet the Life Safety Performance Level, structural elements may experience failure and/or collapse, and the overall risk of life-threatening injury as a result of primary structural damage is expected to be high.

INTRODUCTION

Over the last several decades, the awareness of potential earthquake hazards has increased throughout the Intermountain West and along the Wasatch Front. Continual research has confirmed that significant earthquakes have and will occur at regular geologic intervals along the Wasatch Front and its surrounding areas. Along with this improved understanding of seismic potential, a better knowledge of structural response to these forces has developed. As a result, innovative concepts have been incorporated into building codes that improve the performance and safety of building structures during a seismic event.

Many of the code revisions made throughout the years have increased the degree of detailing required for both the lateral force resisting elements and connections to these elements. Many older structures were designed and built without these requirements and as a result, are not designed or detailed to withstand the effects of a major potential earthquake.

A series of nationally recognized standards have been developed over the past few decades to identify deficiencies, evaluate those deficiencies and, as required, rehabilitate existing buildings. These standards provide a methodology to improve building performance and occupant safety during a major seismic event.

The Department of Agriculture and Food building was built prior to the inclusion of many the code standards referenced above, that improve seismic performance. As a result, the building has deficiencies and is not expected to perform as well as a newer structure.

OBJECTIVES AND SCOPE

This report summarizes an assessment of the structural and nonstructural deficiencies of the Utah Department of Agriculture and Food building.

The following is a list of tasks performed as part of this evaluation:

- Perform a study of the existing building drawings to develop an accurate understanding of the construction of the building.
- Review existing conditions and documents for agreement.
- Perform an ASCE/SEI 41-13, *Seismic Evaluation and Retrofit of Existing Buildings*, Tier I evaluation which includes completing required checklists to identify potential deficiencies.
- Prepare a written report of findings and recommendations.

BUILDING INFORMATION

The Utah Department of Agriculture and Food building in Salt Lake City, Utah was built in 1980. Construction documents were available for the structure. The building is four stories. It currently houses offices and laboratory spaces.

The building is classified as Building Type C2, Concrete Shear Walls with Stiff Diaphragms, and Building Type C2A, Concrete Shear Walls with Flexible Diaphragms, on the roof. Diaphragms are composed of concrete topping slabs and precast concrete double tees in the stiff diaphragm areas and steel deck on the roof. The exterior of the building is a concrete building frame with concrete shear walls which resist forces due to earthquakes and wind.

BASIS OF SEISMIC EVALUATION

A Screening Phase (Tier I) seismic evaluation of the Utah Department of Agriculture and Food building was performed in accordance with ASCE/SEI 41-13, *Seismic Evaluation and Retrofit of Existing Buildings*. This standard is nationally recognized for the seismic evaluation and retrofit of existing buildings.

The Basic Performance Objective for Existing Buildings (BPOE) with an enhanced hazard level was used during this evaluation. The BPOE accepts a lower level of safety and a higher risk of collapse than would be provided by similar standards for new buildings. Buildings meeting the BPOE are expected to experience little damage from relatively frequent, moderate earthquakes but significantly more damage and potential economic loss from the most severe and infrequent earthquakes.

The hazard level used during this evaluation was a seismic event with a 5% probability of being exceeded in a 50-year period (BSE-2E). This event has a mean return period of 1000 years. The BSE-2E event was selected based on engineering judgement regarding the increased risk that these higher events play in the Wasatch region.

The performance level used for this evaluation was the Life Safety Performance Level. For this study, the Life Safety Performance Level is defined as the level of seismic event in which structural components are expected to maintain a margin of safety against failure and/or collapse, and the overall risk of life-threatening injury as a result of primary structural damage is expected to be relatively low.

SITE SEISMICITY

The Utah Department of Agriculture and Food building is located within close proximity to the Wasatch Fault and geologic seismic hazard mapping indicates that this site is likely to experience severe lateral ground motion. The characteristic major seismic hazard for this fault (MCE) has a magnitude of 7.2-7.3 with a mean return period of 2500 years. MCE (Maximum Considered Earthquake) is meant to represent the large, rare seismic event that is characteristic for the site. The determination of these events is based on probabilistic and deterministic analyses of available geo-seismic data.

ASCE/SEI 41-13 defines a minimum level of lateral forces to use for the evaluation of existing structures based on expected ground motions during the previously mentioned seismic events. These ground mo-

tions are obtained from the United States Geological Survey (USGS) contour maps, prepared in cooperation with NEHRP (National Earthquake Hazards Reduction Program). These contour maps are separated into two categories, short and long periods. The short period and long period maps correspond to periods of 0.2 seconds and 1.0 seconds, respectively. The period of a structure is the amount of time required to complete one cycle of natural vibration. Buildings comprised of stiff elements, such as concrete or masonry walls, have lower periods.

For the Utah Department of Agriculture and Food building, which is composed of stiff concrete shear walls, contour maps indicate the following seismic response coefficients:

Latitude = 40.78

Longitude = -111.94

Site Class = D

Short Period

$$S_{s,5/50} = 1.110 \text{ g}$$

$$F_a = 1.056$$

$$S_{xs,BSE-2E} = 1.172 \text{ g}$$

Long Period

$$S_{x1,5/50} = 0.373 \text{ g}$$

$$F_v = 1.654$$

$$S_{x1,BSE-2E} = 0.617 \text{ g}$$

A4 APPENDIX 4 - STRUCTURAL EVALUATION

The figures above indicate horizontal accelerations could be in excess of about 1.2 times its own weight since its period is approximately 0.25 seconds. The site was determined to be located in an area of high seismicity according to ASCE/SEI 41-13. A copy of the short period USGS contour map can be seen in Figure 1.

Utah 2008 5-Hz SA w/2%PE50YR

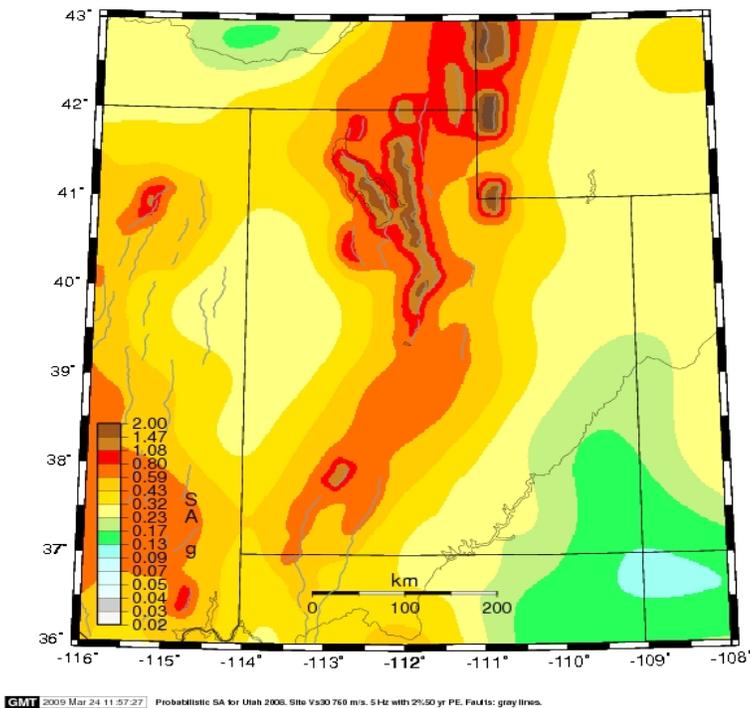


Figure 1 - USGS Acceleration Map (MCE)

TIER I BUILDING EVALUATION

An ASCE/SEI 41-13 Tier I Evaluation (Screening Phase) consists of a series of checklists and simple quick check calculations used to identify potential structural seismic deficiencies of the building. Any items flagged as “non-compliant” in the screening phase may warrant a more detailed evaluation (Tier II, Evaluation Phase) if the aim is to ultimately enable improved seismic performance.

A site visit is also performed during this phase to verify, to the degree possible, that construction documents and existing conditions are in general conformance with any available construction documents.

Measurements of typical members are taken for areas where no construction documents are available. In the absence of available construction documents, assumptions regarding the material properties and composition were necessary to complete the Tier I portion of this evaluation. Destructive testing and demolition were also not required for this analysis.

Many potential structural and non-structural deficiencies were identified during the Screening Phase. To see a complete list of these items, please see Appendix A, Tier I Checklist Items. Items in these lists are marked as Compliant (C), Non-compliant (NC), Unknown (U), or Not Applicable (N/A).

TIER I FINDINGS

The beginning of an ASCE/SEI 41-13 evaluation involves identifying the material properties to be used in the analysis. The existing construction documents indicated that the yield stress of the primary reinforcing steel to be 60 ksi, the yield stress of stirrups and ties to be 40 ksi, and the compressive strength of concrete to be 4000 psi.

The concrete appeared to be in generally good condition throughout the most of the building. Small areas of concrete deterioration were noted but should not have a large impact of the load carrying ability of those elements.

The following are lists of **Potential Deficiencies** identified for each area of the building during the Screening Phase (Tier I) evaluation.

Potential Deficiencies from Tier I Structural Checklists

1. Liquefaction: No specific reports regarding liquefaction potential of soils under the building were available. The Utah Geological Survey identifies this area as having a high liquefaction potential. Liquefaction of soils during an earthquake may cause the soils to lose all vertical-load-bearing capacity. Loss of vertical support for the foundation can result in large forces, large differential settlements, and large instabilities.
2. Overturning: The ratio of the least horizontal dimension of the seismic force resisting system at the foundation level to the building height is less than $0.6S_a$. S_a is the assumed spectral acceleration that the building will experience during the seismic event. A higher spectral acceleration results in the higher building forces and more demand on building elements. Since the least horizontal dimension of the building is less than $0.6S_a$, the overturning forces may exceed the capacity of the soil, the foundation structure, or both.
3. Shear Stress Check: The shear stress in the concrete shear walls is greater than $2\sqrt{f'_c}$. As such, the shear failures may occur before flexural failures. Shear failures tend to result in more instabilities of the structure than do flexural failures.
4. Uplift at Pile Caps: Pile caps do not have top reinforcement. Seismic forces may induce uplift

at the foundation that must be delivered into the piles for overturning stability. The lack of top reinforcement means that the pile cap cannot distribute the uplift forces to the piles resulting in overturning instabilities.

5. Deterioration at Collector Connections: See figures below. Deteriorated collector connections may result in the structures inability to transmit forces to the resisting elements. The load path deficiency can produce local collapse during a seismic event.
6. Damage to Structural Members: Cracking and spalling of concrete was noted during our visit. This reflects ongoing corrosion issues which may ultimately render the structure compromised, particularly for transient events such as earthquakes. A routine maintenance program for repair of the building exterior should be employed to limit further deterioration and to keep the building serviceable.
7. Unbraced Concrete Shear Walls: On the south side of the building, the concrete shear walls, which provide primary north-south lateral support, are not braced or supported on either side. During a seismic event, it is possible that the exposed ends of these walls may buckle and pose a life safety risk.



Figure 2 – Deterioration of Collector Connections



Figure 3 – Cracking at Concrete Shear Walls



Figure 4 – Spalling of Concrete Beams

In addition to structural checklists, a Screening Phase (Tier I) evaluation requires a review of the non-structural components. Nonstructural failures are common during seismic events. For example acoustical ceiling systems will often collapse blocking exits or tall narrow contents, such as cabinets, will topple. During our site visit, no specific nonstructural deficiencies were noted; however, careful consideration of any potential nonstructural hazards should be an ongoing consideration for building occupants.

CONCLUSION AND LIMITATIONS

The Utah Department of Agriculture and Food building was built prior to the development of current seismic design and detailing standards. Some seismic deficiencies were found during the Screening Phase which may indicate the building may not meet the Life Safety Performance Level. When a structure does not meet the Life Safety Performance Level, structural elements may experience failure and/or collapse, and the overall risk of life-threatening injury as a result of primary structural damage is expected to be high.

The primary purpose of this report was to identify deficiencies with the seismic structural system. However, deterioration, corrosion, and spalling of the exterior concrete was noted during our site visit. A routine maintenance program for repair of the building exterior should be employed to limit further deterioration and to keep the building serviceable.

The deficiencies outlined in this report are *potential* deficiencies and should not be characterized as problems certain to become expressed in a significant earthquake. Rather, the Tier 1 evaluation serves to identify potential seismic performance issues that are most likely to become apparent in an earthquake. Should stakeholders of this building wish to consider continued occupancy, further evaluations (including Tier 2 and perhaps Tier 3) are recommended. These more detailed evaluations serve to characterize, using very specific measures, the performance of the building and the behavior of potential deficiencies outlined in this report. It then becomes possible to cater a rehabilitation and reinforcement strategy to a specific performance objective while taking advantage of the inherent strength of the existing building.

The conclusions of this report are limited to the information available from provided structural and architectural drawings along with limited observations taken during the site visit.

These conclusions are intended to evaluate the life safety of the building occupants during a significant seismic event. This evaluation presents conclusions that will allow the primary structural system to meet the Life Safety Performance Level. Under this type of performance level, the building may experience significant damage during a large event.

The objective of this performance level is to reduce life-threatening injury to occupants; however, once the seismic event is over, the building may require some rehabilitation. The owner shall consider if the selected performance level is appropriate for the intended use of the building. If desired, a similar evaluation/upgrade approach would be used with a higher seismic performance level (i.e. Immediate Occupancy). However, strengthening measures would be more severe and costs would increase according to the performance level.