

**Information Summary**

Primary Use            Engineering  
 Secondary Use  
 Use Code             12  
 Gross Area            55,001  
 Year Built             1967

**Rating Summary**

Category	Section	Value	Campus Rating	Campus Score	Review Rating	Review Score
Substructure	Foundation	8	80	6.4	90	7.2
	Basement Construction	3	100	3.0	100	3.0
Shell	Superstructure	7	90	6.3	90	6.3
	Exterior Enclosure	7	70	4.9	70	4.9
	Roofing	7	100	7.0	60	4.2
Interiors	Interior Construction	6	60	3.6	60	3.6
	Stairs	3	70	2.1	70	2.1
	Interior Finishes	4	60	2.4	60	2.4
Systems	Conveying	3	50	1.5	70	2.1
	Plumbing	5	50	2.5	60	3.0
	HVAC	14	40	5.6	50	7.0
	Fire Protection	6	70	4.2	30	1.8
	Electrical	8	70	5.6	50	4.0
	Data & Communications	5	90	4.5	80	4.0
General	Equipment & Furnishings	1	50	0.5	50	0.5
	Special Construction	1	0	0.0	100	1.0
	Site Conditions	2	70	1.4	70	1.4
	Safety Standards	4	60	2.4	50	2.0
	Building Suitability	3	80	2.4	80	2.4
	Building Adaptability	3	80	2.4	80	2.4
		<b>100</b>		<b>68.7</b>		<b>65.3</b>

**Building Summary**

Brown Hall was built in 1966 and houses Mechanical and Electrical Engineering programs.
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**Survey Notes**

2019-03-15	Nina Scott	First Floor Inspection: Bob Scarbrough, Dan Warren, Nina Scott
2019-03-07	Nina Scott	Second and Third Floor Inspection: Bob Scarbrough, Dan Warren, Nicole Simms, Nina Scott
2019-01-25	Nina Scott	Fourth Floor Inspection: Bob Scarbrough, Dan Warren, Nicole Simms, Nina Scott
2002-05-08	conversion	Review Inspection:: Architectural: Bill Stockard; Structural: Bill Stockard; Mechanical: Tom Higgins; Electrical: Tom Higgins;
2002-01-29	conversion	Campus Inspection:: Lead: Glenn Binkley Team: Billingsley, Cobb, Nivens, Wheaton, Wheeler

Foundation	Value	Campus Rating	Campus Score	Review Rating	Review Score
A10	8	80	6.4	90	7.2

**Items**

Cracked Walls	2	****
Settlement	S	*****
Deterioration	S	*****
Drainage	3	***

**Description**

Foundation materials are steel and concrete. Exterior columns are on individual footings and piers. Interior footings are individual footings and piers. Foundation walls are on continuous footings.

**Condition / Recommendation**

Structural repair in 1991 - see reference page

Some water infiltration at west stair and south wall (mid-bldg). Foundation wall condition and drainage needs to be investigated further.

Basement Construction	Value	Campus Rating	Campus Score	Review Rating	Review Score
A20	3	100	3.0	100	3.0

**Items**

Floor Slab	NA	
Wall Condition	NA	
Settlement	NA	
Water Problems	NA	

**Description**

None

**Condition / Recommendation**

(none)

Superstructure	Value	Campus Rating	Campus Score	Review Rating	Review Score
B10	7	90	6.3	90	6.3

**Items**

Floor Structure Condition	2	****
Roof Structure Condition	S	*****

**Description**

Floor structure is reinforced concrete slab and beam.  
Roof structure is steel truss and nailable concrete.

**Condition / Recommendation**

Structural repair in 1991 - see reference page

Exterior Enclosure	Value	Campus Rating	Campus Score	Review Rating	Review Score
B20	7	70	4.9	70	4.9

**Items**

Wall Condition	3	***
Caulking	2	****
Cleaning & Pointing	3	***
Painting	3	***
Window Condition	3	***
Exterior Door Condition	S	*****
Exterior Hardware	S	*****

**Description**

Exterior walls are reinforced concrete columns and beams, and, non-load bearing masonry. Non-structural walls are brick and concrete block. Windows are aluminum awning type with single glazing. Exterior doors are steel and in good condition. Door hardware in good condition and is ADA compliant.

**Condition / Recommendation**

Electric door opener installed on handicap entrance door in 1998.  
 Several areas need tuckpointing, particularly at precast quoins on east end. Minor cracks in brick on southwest corner.  
 Single pane windows are not energy efficient; need replacing.  
 Dormers on roof need painting as well as exterior door trim while cornices and Queen Anne gutters are in good shape.  
 Exterior doors and hardware recently replaced.  
 Metal louvers are rusted and need replacing or painting.

Roofing	Value	Campus Rating	Campus Score	Review Rating	Review Score
B30	7	100	7.0	60	4.2

**Items**

Roofing	S	*****
Parapets	S	*****
Flashing	S	*****
Drainage	S	*****

**Description**

Roof material is fiberglass shingles. In March 2019, installed 3/4" plywood sheathing with synthetic underlayment over 2x4 wood sleepers at 24" O.C. over the original cementitious deck planks.  
 Parapets are brick over block construction. Flashing is copper with metal counterflashing. Existing Queen Anne gutters were lined with EPDM membrane during 2019 roof replacement project.  
 Roof & flashing was replaced in March 2019.

**Condition / Recommendation**

(none)

**Roof Information**

Type	Manufacturer	Location	Area	Year New	Warranty End
Landmark Pro Architectural Shingles	CertainTeed	Sloped	14,559	2019	

Interior Construction	Value	Campus Rating	Campus Score	Review Rating	Review Score
C10	6	60	3.6	60	3.6

**Items**

Ceilings	3	***
Interior Walls - Partitions	2	****
Wall Suitability	2	****
Wall Code Compliance	3	***
Interior Doors	4	**
Interior Hardware	U	*

**Description**

Ceiling systems are mostly exposed structure with a few suspended lay-in metal grid systems and plaster. Interior walls are mostly masonry and load bearing masonry with a few metal studs partitions. Interior doors are wood and steel. Hardware is generally good but old and not ADA compliant.

**Condition / Recommendation**

Corridors are used for ventilation air on floors 1-3. Corridors are used for return air on the fourth floor. The corridor doors and walls have louvers in them. The doors are old but mostly in good condition; louvers have heavy patina. Most ceilings are exposed structure in this building with a few suspended acoustical grid systems. The fourth floor ceiling is plaster and has a lot of water damage from roof leakage. Cannot achieve proper code compliance unless the HVAC is redesigned and replaced. Some card reader access has been added. Knobs need to be changed out for lever handles for ADA compliance.

Stairs	Value	Campus Rating	Campus Score	Review Rating	Review Score
C20	3	70	2.1	70	2.1

**Items**

Stair Construction	2	****
Stair Finishes	3	***
Handrails	4	**
Code Compliance	U	*

**Description**

Stairs are steel structure with concrete treads and risers. Handrails do not meet code. Stairs discharge directly to the outside at ground level.

**Condition / Recommendation**

Entrance to the mechanical equipment room is through the west stairwell on the first floor. Two sections of railing are missing beside the entrance ramp.

Interior Finishes	Value	Campus Rating	Campus Score	Review Rating	Review Score
C30	4	60	2.4	60	2.4

**Items**

Ceiling Finishes	4	**
Wall Finishes	3	***
Floor Finishes	U	*
Special Areas (Toilets)	3	***

**Description**

Ceilings are exposed or painted finish with a few areas of suspended ceiling grid system. Most walls finishes are paint with a small amount of wallcovering. Floor finishes are VAT/VCT, concrete and carpet.

5 different types of tile can be seen at same time.

**Condition / Recommendation**

Most of the classrooms have the sprayed-on soundproofing over the exposed structure. It has yellowed and needs painting, but otherwise is functioning well. Most ceilings in the building are painted (textured) exposed structure. Installation of a metal lay-in grid ceiling system throughout would enhance the appearance.

There are 9" floor tiles that contain asbestos and in very bad shape. These should be abated.

The toilets are small in this building.

Interior signage is not consistent and needs to be brought up to ADA standards during next general building renovation.

Most walls are painted block and in fair condition.

A few offices have carpet in varying condition. Some have VAT underneath.

First floor has some ceiling damage from leaking pipes and some wall damage from water infiltration.

Most toilet finishes are old and dated.

Conveying	Value	Campus Rating	Campus Score	Review Rating	Review Score
D10	3	50	1.5	70	2.1

**Items**

Elevator Condition	3	***
Elevator Suitability	3	***
Other Conveying	4	**
ADA Compliance	2	****

**Description**

One Dover hydraulic elevator with rated speed of 150 fpm and rated capacity of 4000 lbs. Controls were upgraded to ADA standards in 1998.

**Condition / Recommendation**

The elevator is the original installed when the building was constructed. The car and elevator equipment should be upgraded.

Rating for "other conveying" is for an outdoor lift used by Engineering to handle large pieces of lab equipment. It is a flat deck that will raise/lower from first floor level to truck bed height. Needs some work. Hydraulic pump for this lift sits (exposed) underneath east stair.

Elevator controls and safety devices updated in 2009-2010.

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Plumbing	Value	Campus Rating	Campus Score	Review Rating	Review Score
D20	5	50	2.5	60	3.0

**Items**

Plumbing Fixtures	3	***
Domestic Water Distribution	3	***
Back Flow Preventers	2	****
Sanitary Waste	3	***
Rain Water Drainage	4	**
Other Plumbing Systems	3	***
Code Compliance	2	****

**Description**

Services provided are hot and cold water, sanitary drains and storm drains. Hot water energy source is steam with 0 storage capacity and 260 gph recovery capacity.

First floor has one women's restroom (no men's). Fourth floor has one men's restroom (no women). Third floor has both. Second floor has both that are ADA accessible.

**Condition / Recommendation**

The number of toilet fixtures is not adequate for the current occupancy of this building. Increase in fixtures may warrant increase in sanitary sewer line size in the building.

One mens and one womens toilet upgraded to ADA standards in 2001.

HVAC	Value	Campus Rating	Campus Score	Review Rating	Review Score
D30	14	40	5.6	50	7.0

**Items**

Fuel Energy Supply Systems	NA	
Heat Generation Systems	3	***
Heat Rejection Systems Refrigeration	NA	
Heat HVAC Distribution Systems	3	***
Heat Transfer Terminal & Package Units	2	****
HVAC Instrumentation and Controls	U	*
HVAC Systems T A B	U	*
Other Special HVAC Systems & Equip	2	****

**Description**

HVAC is a 4 pipe perimeter fan coil system combined with a constant volume minimal make up air system, and a constant volume system for the 4th floor. Minimal EMS is provided in the equipment room. Steam and chilled water are provided from the central plant. DX auxillary cooling is provided for the computer labs.

Distributed pumps have been replaced with tertiary pumps and bypass controls resulting in a primary/variable secondary central pumping system.

A process chiller was installed for research in 2016.

**Condition / Recommendation**

- \* Fume Hood Renovation - 1980- see reference page; Fume hoods need to be replaced and provided with sufficient make-up air and controls.
- \* The HVAC system needs to be replaced to comply with IAQ and latest codes.
- \* The building steam, hot water, and chilled water distribution systems need to be replaced.
- \* Replace the 4th floor constant volume dual duct system with a VAV system including economizer cycle.
- \* Control and distribution problems plague the building.
- \* The interior of the building requires additional capacity to cool the space.
- \* Installation of tertiary pumps and bypass controls should eliminate 98% of the university's humidity problems.
- \* All pipes need to be replaced.
- \* New HVAC equipment needs to be provided with dehumidification control sequences.

The building was connected to the central chiller plant in 1992 or 1993.

The portion of the central steam loop serving the engineering quad and the lines connecting the building to the central loop were replaced in 2001.

Fire Protection	Value	Campus Rating	Campus Score	Review Rating	Review Score
D40	6	70	4.2	30	1.8

**Items**

Sprinkler Systems	NA	
Standpipes	NA	
Fire Pump	NA	
Fire Extinguishers	S	*****
Fire Alarm System	S	*****
Other Fire Protection Systems	NA	

**Description**

The Fire Alarm System is a Simplex 4100U, installed in 2006. The system consists of pull stations, speakers with a PA, strobes, heat and smoke detection, and door holders. The system is connected to a central network monitored by University Police.

**Condition / Recommendation**

Should install a sprinkler system.



Electrical	Value	Campus Rating	Campus Score	Review Rating	Review Score
D50	8	70	5.6	50	4.0

**Items**

System Capacity	3	***
Electrical Service and Distribution	3	***
Branch Wiring	3	***
Lighting	U	*
Special Electrical Systems	4	**
EMS / Controls	4	**
Exit / Emergency Lights	U	*
Other Electrical Systems	4	**
Code Compliance	3	***

**Description**

Electrical service entrance is 1200 amp. Service voltage is 277/480. Distribution voltage is 110/208 and 277/480. Basic lighting is 2 and 4-tube fluorescent. There is only one battery-pack at the top of each stair for emergency lighting. The building is served by an underground high voltage system.

2012: Delamping throughout building. Removed every other lamp in corridors. Removed 2 lamps from every 4-lamp fixture/ 1 lamp from every 3-lamp fixture in rooms & added reflectors.

2013: Installed occupancy sensors in all RR's & stairwells.

**Condition / Recommendation**

- \* The current distribution and switchgear is in poor condition with limited circuits available.
- \* Upgrade and code compliance is recommended.
- \* Electrical room separate from mechanical is recommended.
- \* Dedicated circuits and lighting are inadequate and replacement is recommended. Recommend LED lighting.
- \* Grounding and dedicated circuits may be inappropriate.
- \* Should install emergency lighting.
- \* BUS duct on First Floor needs upgrade; replacement buckets extremely difficult to locate.
- \* Much of the equipment in the building is large-scale Mechanical and Electrical Engineering training equipment. Electrical requirements for this equipment should be reviewed and considered when upgrading capacity and loads.

Delivery Order No. 2, Performance Contracting, upgraded all campus buildings existing fluorescent lighting by installing new electronic ballast and T 8 lamps, 4100 K, in the existing fixtures. CFLs were used as replacement for all incandescent lighting where applicable.

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Data & Communications	Value	Campus Rating	Campus Score	Review Rating	Review Score
D60	5	90	4.5	80	4.0

**Items**

Wiring / Fiber Optic System	2	****
Distribution Closets	4	**
Accessible Cableways	2	****
Special Requirements	4	**

**Description**

Voice/Video: Cable to building is direct burial.

Data: Building is serviced by sufficient fiber from campus core. All building cabling meets current Category 6 standards. All work areas within building have network services available. Sufficient wiring closets and closet space are allocated in building. Some fiber distribution is not properly managed in cassettes or trays. Building has appropriate distribution racks and cabinets. Building cable pathways are in sleeves and trays where appropriate. All network switching equipment is gigabit capable. Some network switches are not 802.11at (modern PoE+) capable. Work areas within building have sufficient wireless coverage.

Voice/Video: Main demarcation point is in existing mechanical room. Office telephone drops go back to large utility boxes recessed in hallways. No cable television cabling exists. Prescott Hall shares cabling that originates in the mechanical room located on the bottom floor.

**Condition / Recommendation**

Voice/Video: Relocate main demarcation point if future systems need that space in mechanical room or replace all phones with VoIP. Splice cabling going to Prescott Hall and place in moisture proof case. Install television feed to building. Address any external wire molding that contains telephone wire.

Data: An upgrade to hybrid multi/single mode cable is preferred. Current fiber pairs are adequate but extra capacity is desired. Ventilation in distribution closet is inadequate. Not all horizontal or vertical cables are in channel within building. Approximately 50% or more of the existing cable channel is full. Approximately 50% or more of the existing horizontal or vertical conduits (trunk cables) are full.

Sufficient cableways, conduit, and distribution closets need to be incorporated at the next major renovation. Existing fiber distribution should be managed into cassettes and trays. Existing non-PoE+ switches should be eventually replaced with PoE+ switches.

Equipment & Furnishings	Value	Campus Rating	Campus Score	Review Rating	Review Score
E10	1	50	0.5	50	0.5

**Items**

Equipment	4	**
Furnishings	4	**

**Description**

Much of the furnishings is old with a few spaces having been updated with new furnishings and AV equipment. Some of the illustration boards have been upgraded but are chalk- and whiteboards.

Much of the equipment in the building is large-scale Mechanical and Electrical Engineering training equipment.

2015, Fall - Room 315: New AV system, including new projector and 2 large screen monitors installed.

**Condition / Recommendation**

While a few rooms have been individually updated with new furnishings and equipment, most is outdated and not appropriate for current or future teaching methods requiring audio visual equipment and a flexible teaching environment.

Special Construction	Value	Campus Rating	Campus Score	Review Rating	Review Score
F10	1	0	0.0	100	1.0

**Items**

Special Construction Systems	NA	
Special Facilities	NA	
Special Controls and Instrumentation	NA	

**Description**

None

**Condition / Recommendation**

(none)

Site Conditions	Value	Campus Rating	Campus Score	Review Rating	Review Score
G10	2	70	1.4	70	1.4

**Items**

Access to Building	2	****
Sidewalk & Steps	3	***
Exterior Lighting	3	***
Rain Water Drainage	4	**
Utilities & Services	3	***

**Description**

(none)

**Condition / Recommendation**

North side of the building catches a lot of surface water from the parking lot. Exterior lighting is inadequate. Telecommunication conduit is in place but cable needs to be installed. Exterior signage does not meet ADA guidelines.

South side walk at steps has settled making a tripping hazard. Walk needs reworking. All surrounding walks are in poor condition and needs replacement. Some drains in window wells are full of debris; needs cleaning.

Downspout on southeast corner appears to be obstructed; washing soil & mulch. Water infiltration on east side of building under porch and west end needs to be investigated.

Safety Standards	Value	Campus Rating	Campus Score	Review Rating	Review Score
Z10	4	60	2.4	50	2.0

**Description**

Asbestos containing materials are present in the building. There are 9" asbestos floor tiles in the building. Deficiencies have been previously noted regarding the corridor ratings, lack of emergency lighting and lack of a sprinkler system.

**Condition / Recommendation**

(none)

Building Suitability	Value	Campus Rating	Campus Score	Review Rating	Review Score
Z20	3	80	2.4	80	2.4

**Description**

The building could remain suitable for current or similar occupancy for the next few years but would require remodeling/renovation costing less than 25% of building replacement value.

**Condition / Recommendation**

(none)

Building Adaptability	Value	Campus Rating	Campus Score	Review Rating	Review Score
Z30	3	80	2.4	80	2.4

**Description**

The building is adaptable for other uses but would require remodeling/renovation costing less than 25% of building replacement value.

**Condition / Recommendation**

(none)

**Projects**

<b>Year</b>	<b>SBC Number</b>	<b>Description</b>	<b>Designer</b>	<b>Cost</b>
1980	166/11-02-79	Fume Hood Renov. (Kewaunee-G.C.)	I.C. Thomasson	0
1986	166/11-06-85	Roof Replacement (Cookeville Sheet Metal - G.C.)	Gingles and Harms	0
1991	166/11-04-1990	Structural Repair Seven Buildings (Mountain Rest.-G.C.) (Cost reflects total project; not just this building)	William Maffet and Assoc.	101,520
2001	166/011-01-1997D	Underground Steam Line Replacement (Cost reflects total project; not just this building)	NJC, Inc.	911,263
2005	166/011-02-2004A	Central Cooling Deficiency Corrections PH2 (Cost reflects total project; not just this building)	I.C. Thomasson / Carwile Mechanical	1,924,600
2006	166/011-02-2003A	Fire Alarm System Update PH II (Cost reflects total project; not just this building)	Vreeland Engineers	1,160,200
2008	166/000-01-2002B5	Campus Wide Lighting Upgrade (Cost reflects total project; not just this building)	Siemens Corp.	2,069,259
2008	166/011-02-2004B	Central Cooling Deficiency Corrections PH. III (Cost reflects total project; not just this building)	I.C. Thomasson	1,019,195
2009	166/011-01-2007	Elevator Safety Upgrades (Cost reflects total project; not just this building)	Adkisson & Associates	775,507
2010	166/011-02-2004E	Central Cooling Deficiency Corrections, PH. 5B (Cost reflects total project; not just this building)	I.C. Thomasson	1,541,939
2018	166/011-07-2015A	Roof Replacement (Brown Hall roof completed March 2019) (Cost reflects four roofs)	Kaatz, Binkley, Jones & Morris Architects	1,759,000

**Attachments**

<b>Description</b>	<b>Pages</b>	<b>Author</b>	<b>Date</b>
State of Tennessee Asbestos Survey	100	State	1984-01-01
Building Floor Plans	4	TTU Facilities Services	1988-01-01
State of Tennessee ADA Survey	1	Law Engineering	1994-07-14
Asbestos Bulk Sampling Report	0	Terracon	2005-02-07
State of Tennessee Asbestos Survey	47	Terracon	2005-10-03
Roof Observatoin Report Photos	5	Richard C. Rinks & Associates, Inc.	2014-05-08
Roof Observation Report	10	Richard C. Rinks & Associates, Inc.	2014-05-28

**Pictures**

<b>Sequence</b>	<b>Location</b>	<b>Description</b>
1	South (front) Elevation	
2	Northwest Elevation	
3	Aluminum Hopper window	Single glazing only, beginning to show wear and tear
4	Fourth Floor Ceiling	Ceiling damage caused by leaking parapet
5	Ground floor corridor-typical floors 1-3	Ceil. is painted structure-grid system would enhance appearance
6	Typical Corridor Door	Louvers in doors for HVAC return-fire code issue
7	Fourth Floor Corridor	Louvers in walls for HVAC return-fire code issue
8	Fourth Floor Corridor Ceiling	Improper ceiling penetration
9	West Stairwell	Items stored under stair, eqpt. rm. entrance in stairwell, handrails/railings do not meet codes
10	East Stairwell	Permanently fixed equipment installed under stair
11	North Side	AC Window units in use on fourth floor