NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018 219

**United States Department of the Interior**
**National Park Service**

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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

## 1. Name of Property

historic name Western Electric Company – Tarheel Army Missile Plant

other names/site number A. M. Johnson Rayon Company, Carolina Rayon Company, Fairchild Engine and Airplane Corporation, Firestone Tire and Rubber Company

## 2. Location

street & number 204 Graham-Hopedale Road **N/A** not for publication

city or town Burlington **N/A** vicinity

state North Carolina code NC county Alamance code 001 zip code 27217

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set for in 36 CFR Part 60. In my opinion, the property ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☐ nationally ☐ statewide ☒ locally. (See continuation sheet for additional comments.)

Kevin Cherry, SHPO 3/3/2016
Signature of certifying official/Title Date

North Carolina Department of Natural and Cultural Resources
State or Federal agency and bureau

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. (☐ See Continuation sheet for additional comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

## 4. National Park Service Certification

I hereby certify that the property is:

☒ entered in the National Register
☐ See continuation sheet
☐ determined eligible for the National Register
☐ See continuation sheet
☐ determined not eligible for the National Register.
☐ removed from the National Register
☐ other,(explain:)

Signature of the Keeper Date of Action
5-2-2016

Western Electric Company – Tarheel Army Missile Plant
Name of Property

Alamance County, NC
County and State

## 5. Classification

**Ownership of Property**
(Check as many boxes as apply)

- ☒ private
- ☐ public-local
- ☐ public-State
- ☐ public-Federal

**Category of Property**
(Check only one box)

- ☒ building(s)
- ☐ district
- ☐ site
- ☐ structure
- ☐ object

**Number of Resources within Property**
(Do not include previously listed resources in count.)

| Contributing | Noncontributing | |
|---|---|---|
| 10 | 5 | buildings |
| 0 | 0 | sites |
| 3 | 0 | structures |
| 0 | 0 | objects |
| 13 | 5 | Total |

**Name of related multiple property listing**
(Enter "N/A" if property is not part of a multiple property listing.)

N/A

**Number of Contributing resources previously listed in the National Register**

N/A

## 6. Function or Use

**Historic Functions**
(Enter categories from instructions)

INDUSTRY: Manufacturing Facility
INDUSTRY: Industrial Storage

**Current Functions**
(Enter categories from instructions)

VACANT: Not in use
VACANT: Not in use

## 7. Description

**Architectural Classification**
(Enter categories from instructions)

Other: Steel-framed, load-bearing-brick-wall mill construction
Other: Reinforced-concrete construction

**Materials**
(Enter categories from instructions)

foundation BRICK
walls BRICK
CONCRETE
METAL
roof METAL
RUBBER
other

**Narrative Description**
(Describe the historic and current condition of the property on one or more continuation sheets.)

## 8. Statement of Significance

**Applicable National Register Criteria**
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- ☒ **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ☐ **B** Property is associated with the lives of persons significant in our past.
- ☒ **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ☐ **D** Property has yielded, or is likely to yield, information important in prehistory or history.

**Criteria Considerations**
(Mark "x" in all the boxes that apply.)

Property is:

- ☐ **A** owned by a religious institution or used for religious purposes.
- ☐ **B** removed from its original location.
- ☐ **C** a birthplace or grave.
- ☐ **D** a cemetery.
- ☐ **E** a reconstructed building, object, or structure.
- ☐ **F** a commemorative property
- ☐ **G** less than 50 years of age or achieved significance within the past 50 years.

**Areas of Significance**
(Enter categories from instructions)

Architecture
Industry

**Period of Significance**
1943-1966

**Significant Dates**
1943, 1951, 1952, 1958, 1959

**Significant Person**
(Complete if Criterion B is marked)
N/A

**Cultural Affiliation**
N/A

**Architect/Builder**
Albert Kahn Associated Architects and Engineers, Inc.
Western Electric Company's Factory Planning and Plant Engineering Department
Six Associates, Inc., architects

**Narrative Statement of Significance**
(Explain the significance of the property on one or more continuation sheets.)

## 9. Major Bibliographical References

**Bibliography**
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

**Previous documentation on file (NPS):**

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ Previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey #
- ☐ recorded by Historic American Engineering Record

**Primary location of additional data:**

- ☒ State Historic Preservation Office
- ☐ Other State Agency
- ☐ Federal Agency
- ☐ Local Government
- ☐ University
- ☒ Other

Name of repository: Wilson Library, UNC-Chapel Hill
May Memorial Library, Burlington

## 10. Geographical Data

**Acreage of Property** 22.04 acres

See Latitude/Longitude coordinates continuation sheet.

**UTM References**
(Place additional UTM references on a continuation sheet.)

| | Zone | Easting | Northing | | Zone | Easting | Northing |
|---|---|---|---|---|---|---|---|
| 1 | | | | 3 | | | |
| 2 | | | | 4 | | | |

See continuation sheet

**Verbal Boundary Description**
(Describe the boundaries of the property on a continuation sheet.)

**Boundary Justification**
(Explain why the boundaries were selected on a continuation sheet.)

## 11. Form Prepared By

name/title Heather Fearnbach
organization Fearnbach History Services, Inc. date 8/15/2015
street & number 3334 Nottingham Road telephone 336-765-2661
city or town Winston-Salem state NC zip code 27104

## Additional Documentation

Submit the following items with the completed form:

**Continuation Sheets**

**Maps**

A **USGS map** (7.5 or 15 minute series) indicating the property's location

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

**Photographs**

Representative **black and white photographs** of the property.

**Additional items**
(Check with the SHPO or FPO for any additional items.)

## Property Owner

(Complete this item at the request of SHPO or FPO.)

name Donnie Neuenberger, Saucier, Inc.
street & number 5415 Chand Creek Road telephone 301-440-8136
city or town Tallassee state AL zip code 36078

**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listing. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 *et seq.*)

**Estimated Burden Statement:** Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P. O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20303.

## Section 7. Narrative Description

### Setting

The Western Electric Company – Tarheel Army Missile Plant is located at 204 Graham-Hopedale Road approximately two miles east of downtown Burlington's commercial district. The industrial complex occupies a nearly square, predominately flat, 22.04-acre parcel on the road's west side. A tall chain-link fence bounds most of the tract. Within the fence, the site is paved with asphalt and concrete. Much of the concrete paving was installed in 1959 in order to facilitate radar trailer testing.

The tract's east section, approximately one-sixth of the parcel adjacent to Graham-Hopedale Road, is not fenced-in. This linear area contains a grass lawn, deciduous and evergreen trees, and landscaped beds in its north two-thirds. Foundation plantings line the office (Building 1-A) façade. An asphalt-paved parking lot occupies the east third of the area between the office and the road. A second asphalt-paved parking lot fills the parcel's southeast corner.

The industrial complex encompasses fifteen one- to three-story brick, steel, and concrete buildings constructed between 1928 and 1978. In order to facilitate the property's management, Western Electric assigned each building a number.[1] The largest edifice, which evolved in stages to span most of the site's central section, comprises the interconnected brick, steel, and concrete Buildings 1-4, 9-11, 17, 20, and 28. Several relatively small structures are situated between this building and the expansive three-story brick and concrete Building 16 at the center of the complex's north end. North of Building 1-A, the power plant (Building 5) and its later addition to the west (Building 18) abut each other. North of Building 18, Buildings 6 and 19, which served as storage and a garage, are also contiguous. A tractor shed (Building 21) and the adjacent reservoir are located north of Building 5 and east of Building 6 in the complex's northeast quadrant. The site's primary industrial waste treatment plant (Buildings 29 and 30) is at the north section's center. A smaller waste treatment plant (Building 23) is located to the west, south of Building 12. Four one-story steel-frame structures sheathed with corrugated-metal panels (Buildings 7, 12, 22, and 31), an electrical substation, and a water tower occupy the lot's northwest quandrant. Building 14, a long, one-story, metal-sided warehouse, fills the complex's southwest corner. The two-story brick and concrete Building 13 stands to its east.

Two railroad spur lines served the plant, running east-west on the central building's north and south sides. Both have been removed.

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[1] Small wall-mounted interior plaques delineate some building numbers, but a site plan issued by AT&T Technologies, Inc.'s Plant Engineering Department on October 24, 1989, serves as the most comprehensive primary source of building numbers.

Graham-Hopedale Road, flanked in this area by commercial and institutional development, runs north-south on the tract's east edge. Immediately south of the Western Electric Company – Tarheel Army Missile Plant, parcels fronting North Church Street contain predominately mid-twentieth-century commercial buildings and associated parking lots. To the north, modest mid-twentieth-century residences, most erected in 1947 to provide housing for Western Electric Company employees, face Hilton Road.

On the property's west side, a tall chain-link fence separates several buildings once utilized by Western Electric from the primary complex. These industrial and commercial buildings are situated on the east side of North Cobb Avenue. The former Full-Knit Hosiery Mill, constructed in 1938, stands west of Building 14. Western Electric and AT&T Technologies occupied the structure from around 1960 until 1991, calling it Building 24. The 1938 mill currently houses Good Samaritan Super Thrift Store. The lot's grade is lower in elevation than that of the Western Electric Company – Tarheel Army Missile Plant. The small, rectangular Buildings 25 and 26, both of which have been modified, are northwest of Building 24. Western Electric also erected two small square structures, one of which was Building 27, northeast of Building 24. The company constructed the large metal-sheathed building to the north in 1987. The structure now serves as a warehouse. These buildings are not included in the National Register boundary due to their physical separation from the main complex, ancillary function, and/or construction after the period of significance.

The inventory list is organized in ascending building number order. As a few of the resources once encompassed in the complex have been demolished or are located outside the National Register boundary, the number sequence is not continuous.

**Buildings 1-4, 9-11, 17, 20, 28: A. M. Johnson Rayon Mill and Fairchild Engine and Airplane Corporation and Western Electric Company Additions, 1928, 1930, 1943, 1959, 1970, Contributing Building**

The 1928 rayon mill (Building 2) and later additions to the east and west are physically linked, creating one building containing approximately 252,000 square feet at ground level. The following description addresses each section by Western Electric's numbering system, which begins at the building's east end and moves west.

**Western Electric Office and Cafeteria Addition (Building 1-A), 1970**

Western Electric's approximately 40,000-square-foot, two-story, flat-roofed office and cafeteria addition stands on the east side of the 1943 office wing (Building 1). Masons executed the orange brick walls in running bond capped with cast-stone coping that extends slightly beyond the wall plane. The

projecting block at Building 1-A's southeast corner features a second story that is cantilevered above the primary office entrance and supported by square reinforced-concrete columns that are slightly inset beneath a cast-stone band and matching ceiling panels. Recessed aluminum-frame plate-glass windows and brick kneewalls enclose the corner block's southeast first-story room, which has an auxiliary aluminum-frame double-leaf glazed door on its south wall. To the north, on the east elevation, brick walls flank the aluminum-frame plate-glass curtain wall from which the primary entrance vestibule projects. The adjacent open space is paved with concrete. Eight tall, rectangular, second-story window openings pierce the corner block's south elevation. West of the corner block, a windowless wall that is in the same plane as Building 1 contains one single-leaf steel door.

The recessed entrance bay near the east elevation's center contains two aluminum-frame double-leaf glazed doors and transoms. In the eight flanking first-story bays, two high, rectangular, tinted-glass windows span the distance between two tall, narrow, tinted-glass windows, framing sections of brick wall. The second story is blind.

The same treatment continues on the east bay of Building 1-A's north elevation. The remainder of the north wall is windowless. A double-run of below-grade concrete steps with metal-pipe railings leads to a concrete-paved area outside the double-leaf steel basement door in the east bay. Metal-pipe and wire-mesh railings top the formed-concrete retaining wall that ameliorates the stairwell's lower elevation. To the west, a straight run of concrete steps with metal-pipe railings rises to a single-leaf steel door.

### *Interior*

On Building 1-A's first floor, a wide, central, east-west corridor separates the south section, which encompasses offices, from the north section, which contains the expansive cafeteria's serving and dining areas. In the south section, the large north room adjacent to the corridor contained central cubicles. Gypsum-board-sheathed partition walls create four offices at the room's southeast corner as well as rooms to the south that flank short north-south and east-west corridors. Many rooms have steel-frame single-leaf wood doors with glazed upper sections. Dropped aluminum-frame ceilings and fluorescent lighting panels remain, but acoustical ceiling tiles and vinyl-composition-tile floors have been removed.

Orange brick sheathes the central corridor walls. To the north, the cafeteria's square-concrete-masonry-unit exterior walls are painted, while gypsum board covers some interior walls. In the kitchen (which occupies Building 1's north section) and serving line, walls are painted concrete block and gypsum board and floors are ceramic tile. The accordion partition wall at the cafeteria's southwest corner could be closed to create a more private dining venue.

Stair halls at Building 1-A'a northwest and southwest corners contain steel and concrete steps with metal-pipe railings that lead to the second story. Identical steps rise from the central corridor's west end adjacent to a passenger elevator. Much of the upper floor has an open plan designed to accommodate office cubicles, although small rooms enclosed with gypsum board and aluminum-frame curtain walls line the north and east elevations. Several private offices and the conference room within the projecting corner block at the building's southeast corner are the sole second-story rooms with windows.

**Fairchild Engine and Airplane Corporation Office Addition (Building 1), 1943**

Only the north and south walls of the one-story, red brick office wing designed by the Detroit architecture firm Albert Kahn Associated Architects and Engineers, Inc., remain visible from the exterior. Masons executed the addition in five-to-one common bond. The sawtooth roof monitors comprise a sloped south face and an almost-vertical north face with bands of tall, multipane, steel-frame sash.

Historic photographs illustrate that a pent hood sheltered eight windows on the south elevation, all of which have been enclosed with brick. Western Electric added two entrances: a mid-twentieth-century double-leaf steel door with a flat-roofed steel canopy, and a late-twentieth-century, double-leaf, aluminum-frame, glazed door and transom.

Building 1's east elevation originally featured a long row of windows sheltered by a pent hood as well as a five-bay-wide and three-bay-deep entrance vestibule at its center. The flat-roofed concrete structure's large double-hung windows and double-leaf door and transom were set in slightly recessed panels beneath a projecting cornice.[2] Western Electric removed the entrance vestibule to facilitate the 1970 construction of Building 1-A. The 1970 addition also entailed the demolition of the north half of the Building 1's east wall to allow Building 1's north section to be renovated to serve as the cafeteria kitchen.

On the north elevation, which is blind, original and later window and door openings have been enclosed with brick. The brick wall rises above a painted concrete foundation.

***Interior***

In Building 1's north section, the sawtooth roof's riveted structural-steel trusses are visible. The building's narrow width and the double truss system's strength allowed the architects to dispense with

[2] Undated Western Electric photographs in the Raymond Donnell Collection, May Memorial Library, Burlington; Burlington Chamber of Commerce, "Burlington, North Carolina: An Industrial Summary," 1952.

interior support columns. When the north half of Building 1's east wall was removed to allow for connectivity between the kitchen and cafeteria, engineers added supplementary horizontal trusses to carry the load.

A central east-west corridor bisects Building 1's north dining room and kitchen and south offices and infirmary. In the dining room, located immediately north of the corridor, three north-south accordion partition walls could be opened or closed as needed to create rooms of various sizes. The vinyl-composition-tile floors have been removed, exposing the poured concrete slab. The ceiling is open to the sawtooth roof. A short north-south corridor west of the dining room provides access to storage rooms and the kitchen, where walls are painted concrete block and gypsum board and floors are ceramic tile.

At the central corridor's east end, a north-south hall spans the south section's full length. The south section's north half, which functioned as the purchasing office, contains a large room with small offices lining the north, west, and south walls. The south section's south half, which housed the infirmary, has a central north-south corridor flanked by exam rooms and offices. The south section retains painted gypsum board walls and dropped aluminum-frame ceilings with fluorescent lighting, but the vinyl-composition-tile floors have been removed.

**A. M. Johnson Rayon Mill (Buildings 2-3), 1928, 1930**

The one-story 1928 rayon mill **(Building 2)** is surrounded on three sides by later additions, with only its seventeen-bay-wide south elevation retaining exterior exposure. The original north wall is intact, but only visible from the interior as it is spanned by a narrow full-width addition that projects to the north. Masons executed the brick walls in a distinctive common bond with five courses of stretchers followed by one course of alternating stretchers and headers. Terra-cotta coping caps the flat parapet.

Decorative corbelling tops tall, wide window and door openings. Paired fifteen-pane steel-frame sash with operable six-pane lower sections have been painted but are otherwise intact on the north and south elevations. The concrete window sills are also painted. The door openings in the sixth and twelfth bays from the east end have been fully enclosed with brick. The fifth bay from the east end contains a replacement single-leaf steel door with a glazed upper section sheltered by a flat metal canopy. The remainder of the original opening is filled with brick.

A straight run of steel steps with metal-pipe railings rises above the door to the single-leaf entrance on the east elevation of the one-story, flat-roofed, windowless, brick control room at the base of the one-hundred-foot-tall signal tower. Steel lattice columns and Building 2's south wall support the steel platform on which the control room rests. Slender riveted-steel members comprise the tower's frame,

which narrows as it increases in height. The tower transmitted radio signals to portable radar antennae testing areas on Building 16's upper and lower roofs.

The eighteen-bay-wide 1930 addition **(Building 3)** to the west is slightly taller, and thus has larger window openings. Paired twenty-one-pane steel-frame sash with operable six-pane lower sections illuminated the interior. The glass has been painted, but peeling paint allows for some light penetration. In the fourth bay from the east end, a matching two-part, twenty-four-pane, steel-frame transom surmounts a replacement single-leaf steel door with a glazed upper section. A smaller fourteen-pane transom tops the double-leaf steel door in the eighth bay from the west end.

Building 20, which housed a chemical plating operation, spans much of Building 3's north elevation. East of Building 20, mechanical equipment and loading docks extend along the north wall of Buildings 2 and 3. A few loading docks remain open, but most have been enclosed with metal panels. Pent roofs project above some of the enclosed docks. Building 28, a metal-sheathed bottled gas storage facility, is located near the east end of Building 2's north wall. The mid-twentieth-century brick loading dock addition that extends from Building 2's northeast corner has a corrugated-metal roll-up service door as well as a single-leaf steel door accessed by formed-concrete steps with a metal-pipe railing.

Sawtooth roof monitors comprising a sloped south face and an almost-vertical north face with bands of tall windows serve the 1928 and 1930 buildings. Riveted structural-steel trusses bear the sawtooth roof system's weight. Most of the wood roof decking and multipane steel-frame sash and tempered-glass panes are intact, but the windows were covered from the outside with metal panels in the 1980s.

***Interior***

Building 2's load-bearing brick west exterior wall separates Buildings 2 and 3. The January 1929 Sanborn map indicates that during the rayon mill's operation Building 2 comprised offices, an ice plant, and inspection, shredding, grinding, aging, spinning, silk washing, reeling, drying, and caustic soda rooms. As Building 3 was in the planning phase at the time of the map's creation, the interior is depicted as open with the exception of an air conditioning room in its northeast section.[3]

In 1946, Western Electric utilized Building 2 as a cabinet shop where employees fitted metal cabinets with gear for radar trailers. Building 3 functioned as a machine shop with a plating shop at its north end. The company gradually subdivided portions of Building 2 and 3 with gypsum-board-sheathed frame partition walls to create laboratories and offices of various sizes. The conference room at Building 2's southeast corner features plywood-sheathed wall cases that contain sliding wood boards

[3] Sanborn Map Company, "Burlington, North Carolina," Sheet 9, January 1929.

utilized for project tracking purposes. Western Electric also installed dropped aluminum-frame ceilings and fluorescent lighting panels that remain in some areas. In most spaces, acoustical ceiling tiles and vinyl-composition-tile floors have been removed and the structural system is exposed.

Round iron posts initially supported the sawtooth roof trusses, sections of which are visible from the interior. Some iron posts remain, but in many cases steel I-beams have either been added or have replaced the original posts. The brick exterior walls are painted throughout. On the walls between Buildings 1, 2, and 3, metal fire doors slide on steel tracks and are held open by weighted pulleys. Wood-panel, vertical-board, or steel doors hang in some interior doorways. Concrete floors provide a durable work surface. Fluorescent lights and sprinkler system pipes hang from the ceilings. Rigid metal ductwork and sizable air handling units remain from the air conditioning systems configured for the plant in 1963. Surface-mounted metal conduit houses electrical wiring.

**Western Electric Addition (Building 20), 1958**

The one-and-one-half-story, rectangular Building 20, has a structural-steel frame, stuccoed upper walls, and brick lower walls with the exception of a wide concrete-block wall that supports a roof monitor of equal size. Paired fifteen-pane steel-frame sash with operable six-pane lower sections pierce the monitor's frame walls. On the north elevation, a straight run of steel steps with metal-pipe railings rises on the concrete-block bay to the single-leaf steel door that provides exterior access to the mezzanine. Building 20 included a plating room with a powerful ventilation system that expelled exhaust into the fiberglass scrubbers with tall circular stacks that are secured to the north wall by metal braces.

The structural system is completely exposed on the single-room interior, which is open to the monitor roof and has a concrete slab floor. The walls are painted. Steel I-beams support an equipment mezzanine with steel-grate floor panels. A frame addition with a slightly lower ceiling height extends the monitor to the south.

**Fairchild Engine and Airplane Corporation Manufacturing Additions (Building 4), 1943, and (Building 11), 1943**

Detroit architect Albert Kahn's firm designed **Building 4**, the expansive two-story steel-frame structure with brick and concrete walls that extends from the 1930 mill's west elevation. Two bands of windows, one just above door transom height and the other a few feet higher, span the south elevation. Each steel-frame window section contains six large rectangular panes. Beneath the lower band, which has a concrete sill, masons laid the brick wall in alternating header and stretcher courses. The walls

between the window rows and above the top tier of windows are stuccoed. Gunite panels have been installed in a reversible manner on the window exteriors. Metal coping caps the flat parapet.

A flat-roofed steel canopy supported by three round steel posts shelters the entrance at Building 4's southeast corner. Two aluminum-frame glazed doors flank a central double-leaf door. Insulation panels cover the sidelights and transom.

Building 9, erected in 1959, and Building 10, an open 1943 structure enclosed in the 1950s, project from the west section of Building 4's south elevation. However, the original wall and windows are intact and visible from inside Building 10. Building 4's southwest corner remains exposed and a tall, wide, sliding, steel door encloses the service bay that fills much of the south wall. A double run of steel steps with metal-pipe railings rises above the service bay to a single-leaf steel door that provides access to the second story.

Building 4's north and west elevations are identical to the south elevation in terms of fenestration and wall composition. However, the west elevation extends above two-story height as the upper section is stepped to create end walls for three wide roof monitors with vertical north and south faces containing bands of steel-frame windows. Most glass panes are intact, but the windows have been covered from the outside with metal siding. Metal-pipe railings mounted on the lower roof parapet adjacent to the monitors secure the rooftop. Western Electric installed air handling equipment on the roof around 1970.

HVAC equipment lines the west elevation, flanking several single and double-leaf steel doors. A flat-roofed, corrugated-metal-sheathed, rectangular, 1970s addition projects from the wall at the second-story level. Rooftop air handlers served a clean room in Building 4. A riveted structural-steel frame supports the addition.

Building 17, erected in 1952, extends from the west section of Building 4's north elevation. To the east, a narrow, one-story, flat-roofed, brick, 1943 structure **(Building 11)** contains several mechanical rooms. A one-story, flat-roofed, corrugated-metal-sheathed, circa 1953 loading dock addition extends from Building 11's east side.

***Interior***

Although Building 4's exterior walls have two tiers of windows, most of the interior was originally one level open to the roof monitors to allow for ample light and airplane assembly. The structure manifests characteristics of the standard landplane hangar design developed by Albert Kahn's firm during World War II. Steel I-beams, round steel columns, and steel trusses are exposed throughout. An overhead

bridge crane system lifted heavy aircraft components and the building's poured concrete floor provided a durable work surface.

Western Electric added painted concrete block and gypsum-board-sheathed partition walls at ground level and created a steel-frame mezzanine adjacent to the south, west, and north walls to provide additional offices and laboratories. Plate-glass windows in interior walls illuminate these spaces. Single-leaf wood and steel doors and roll-up and sliding metal doors secure various rooms. Several sets of steel steps with metal-pipe railings lead to the mezzanine.

Around 1960, Western Electric added the sprinkler system and dropped aluminum-frame ceilings with acoustical tiles and fluorescent lighting panels. The acoustical tiles have been removed, as have the vinyl-composition tiles that covered the concrete floors. Rigid metal ductwork and sizable air handling units remain from the air conditioning systems configured for the plant in 1963.

At Building 4's northeast corner, a narrow 1959 entrance bay spans the distance between Building 11, which extends from the east section of Building 4's north elevation, and Building 20 on Building 3's north elevation. An aluminum-frame clerestory window with large rectangular panes spans the wall above the double-leaf, steel-frame, glazed door at its center. Square turquoise tile wainscoting sheathes the walls of the entrance vestibule and a short corridor. Four steps ameliorate the change in grade. The floor is turquoise terrazzo. Restrooms added in 1959 also have turquoise tile wainscoting.

Two sets of wide concrete stairs with steel treads and metal-pipe railings provide access to the basement under Building 4's east third: one at the east wall's center and one at the building's southeast corner. The basement's south end contains an office-lined corridor with faux-wood-paneled walls on one side and gypsum-board-sheathed walls on the other. In the large open room in the basement's north section, originally a cafeteria, the robust reinforced-concrete mushroom columns that support the structure are visible. This level also had dropped aluminum-frame ceilings with acoustical tiles and fluorescent lighting panels and vinyl-composition-tile floors. In the north room and the expansive restrooms and locker rooms, yellow-glazed rectangular tile covers the walls.

**Western Electric Addition (Building 9), 1959**

The Army Corps of Engineers erected the windowless, one-and-one-half-story, running-bond red brick addition south of Building 4 and west of Building 10 to provide additional service bays. The west elevation contains two corrugated-metal roll-up service doors. Two single-leaf steel doors with glazed upper sections provide interior access north of the service doors, and a matching door pierces the structure's canted southwest corner. The south elevation is blind. A riveted structural-steel frame supports the building, which is divided into two large rooms on each level.

**Fairchild Engine and Airplane Corporation Addition (Building 10), 1943, 1950s**

The flat-roofed, five-bay-wide and nine-bay-long, steel and brick Building 10 extends from Building 4's south elevation. Although the walls rise to a two-story height, the interior is open to the ceiling. Albert Kahn's firm designed the original steel-frame structure, erected to accommodate the final stages of airplane assembly and testing, which had a roof but no walls. In the 1950s, the Army Corps of Engineers added brick curtain walls and two rows of translucent glass-block rectangular windows on the east and south elevations, one just above service door height and the other a few feet higher. The windows have concrete sills. Above the upper windows, corrugated metal siding sheathes the roof system. The west elevation is blind. Metal coping caps the flat parapet.

A steel post-and-beam shed shelters the three-bay loading dock at Building 10's southeast corner. The loading dock's steel structural system supports the steel-plate decking adjacent to the corrugated-metal roll-up service doors. The east elevation also contains two single-leaf steel doors with glazed upper sections near its northeast and southeast corners. Two corrugated-metal roll-up service doors in the first and fifth bays from the south elevation's east end provide additional access.

The interior is predominately open to the steel roof trusses and supported a bridge crane system. Steel steps with a metal-pipe railing lead to an elevated steel mezzanine with a metal-pipe and wire mesh railing at the building's southwest corner, called the crow's nest. Beneath the mezzanine, gypsum-board-sheathed frame walls enclose a small corner room. A long, narrow, steel mechanical platform, also at mezzanine level, occupies the northwest corner. Two doors on the west elevation provided egress to Building 9's two rooms, but the south opening has been enclosed. A door near the north elevation's west end facilitates access to Building 4.

**Western Electric Trailer Loading Building (Building 17), 1952, Contributing Building**

Building 17 projects north from the west end of Building 4's north elevation. The proximity was important to its function, as employees loaded radar trailers with equipment assembled in Building 4. Corrugated metal panels sheath the one-story structure's walls and its offset side-gable roof, which is surmounted by six round ventilators. The roof's east slope is two bays longer than its west slope. The building has a poured-concrete foundation. Concrete pavement surrounds the structure, facilitating access to multiple loading docks.

On the west elevation, two large, rectangular, sashless window openings flank a single-leaf steel door accessed by concrete steps with a metal-pipe railing. At the wall's center, a full-height, roll-up, corrugated-metal service door and a standard-height, double-leaf, metal door provide interior access.

Four large, rectangular, sashless window openings pierce the wall's west end above concrete steps that lead down to the single-leaf steel basement door. A metal-pipe railing surrounds the stairwell.

A full-width, metal-shed-roofed canopy shelters ten loading dock openings on the north elevation. Although all retain original doors that slide up on tracks mounted to framing posts, seven openings have been enclosed with plywood. The doors originally comprised four rows of six glass panes, but all but the second row from the top have been painted or filled with plywood. A flat-metal-roofed equipment shed with a square steel post-and-beam frame and a concrete floor extends from the north elevation's west end. A chain-link fence secures the space.

Concrete steps with a metal-pipe railing rise to the single-leaf steel door at the east elevation's north end. At the wall's center, a metal-shed-roofed canopy surmounts four twenty-four-pane service door openings. To the south, a higher canopy shelters a tall thirty-pane door accessed by a concrete ramp with metal-pipe railings.

The riveted structural-steel frame, comprised of slender posts, beams, and closed-gable Pratt trusses, is exposed on the interior. Batt insulation fills the space between posts. The interior has an open plan and poured-concrete floors. Fluorescent lights, sprinkler system pipes, and ventilation ductwork have been dropped from the exposed steel roof system. A concrete ramp leads to the raised concrete platform that wraps around the north and east elevations adjacent to the loading dock bays. The platform continues along the south elevation, but has been enclosed with gypsum-board-sheathed frame walls containing a metal-lined storage vault. Metal panels were also used to create secured second-story offices accessible from Building 4's north balcony. An opening in the south wall provides access into Building 4 through a double-leaf steel door. A sliding corrugated-metal door mounted on the exterior wall further secures the entrance.

**Power Plant (Building 5), 1943, and Chiller Room (Building 18), 1960, Contributing Building**

The power plant **(Building 5)** and the adjacent chiller room (Building 18) stand north of the 1970 office building's (Building 1-A) north end.

Albert Kahn's firm prepared plans for the 1943 power plant. The three-bay-wide and three-bay-deep building has a stepped roof with three flat levels that gradually increase in height from the one-story south bay to the three-story north bay. Masons executed brick walls in five-to-one common bond capped with metal coping that extends slightly beyond the wall plane.

On the one-story south section's south elevation, two high, long, horizontal recessed panels flank a corrugated-metal roll-up service door. The east elevation contains an identical panel. To the north, the

east elevation of the power plant's central two-story section featured three tall, narrow, recessed panels. The three-story north section's east elevation has always been blind. Its north elevation contains four tall, narrow, recessed panels and a central double-leaf wood door with glazed upper sections. The recessed panels may have initially contained windows. However, the brick color and bond is identical to the surrounding walls and informants familiar with the property beginning in 1950 do not remember windows in this building.

Interior access was not possible. However, according to a 1974 electric power plan drawn by Western Electric Company's Factory Planning and Plant Engineering Department, the interior was open with the exception of a frame-walled workshop at its northwest corner. The building housed three boilers and a series of air compressors, pumps, tanks, and sprinkler system equipment. The upper levels originally served as coal storage bunkers. A railroad spur line facilitated coal delivery until the 1959 conversion of the boilers to natural gas.

A tall concrete platform with square posts extends from Building 5's northwest corner to support an elevated terra-cotta block ash silo. A steel ladder and walkway allow access to the top of the silo.

The one-story, rectangular, flat-roofed **Building 18** projects from Building 5's west elevation. Corrugated metal siding sheathes the steel I-beam frame. The north elevation features two tall, corrugated-metal, roll-up service doors. A single-leaf steel door near the east elevation's north end provides interior access. South of the entrance, steel steps with metal-pipe railings rise in two straight runs with a central landing to the flat roof, where two sizable air-conditioning water towers are located. Two small square louvered vents pierce the south elevation. Electrical boxes and equipment related to the power plant's operation line the south wall.

The open, concrete-floored interior contained four water chillers, all of which have been removed. Six double-pipe pumps remain near the building's west wall. Additional equipment occupies the room's east end.

**Western Electric Storage Building (Building 6), 1943, and Fuel Building/Garage (Building 19), 1958, Two Contributing Buildings**

The 1943 storage facility **(Building 6)** and the adjacent 1950s oil and lubricants storage building and garage **(Building 19)** stand north of Buildings 5 and 18 in the complex's northeast section. The structures have an east-west alignment.

**Building 6**, a one-and-one-half-story, side-gable-roofed structure sheathed with corrugated-metal wall and roof panels, is elevated on a formed-concrete foundation. A one-story, flat-roofed, one-bay-deep

shed extends across the south elevation. A sliding corrugated-metal door with a rectangular six-pane window in its upper section secures the wide door openings on the shed's south elevation. Inside the shed, an identical door is mounted at the entrance to the main block.

Four twenty-five-pane steel-frame windows with central six-pane hoppers pierce the north elevation. The east elevation contains three matching first-story windows of the same size and two smaller, similar, gable windows that illuminate the mezzanine.

Steel posts and beams comprise the structural system, which is exposed on the interior. The building has an open plan and a poured-concrete floor. Steel shelving units with a north-south orientation fill the first floor and mezzanine. Steel steps with metal-pipe railings and a freight elevator lead to the mezzanine. Plywood panels mounted on the north railing's interior provide additional security. The mezzanine floor consists of steel grates. Wide wood roof decking boards rest on steel trusses.

**Building 19** is a two-story, flat-roofed, red-brick structure executed in five-to-one-common bond. A deep, flat, concrete canopy shelters the elevated concrete loading dock that extends across most of the south elevation. A sliding metal-clad door is mounted on an interior steel track above the wide central loading bay. The single-leaf steel door to the east provides access to the upper-level storage room. The west single-leaf steel door opens into the two-story-tall service bay at the building's west end.

The north elevation contains a sliding metal-clad door mounted on an interior steel track above the east workshop's wide entrance. A central single-leaf steel door also provides access to the workshop. A tall, corrugated-metal, roll-up service door fills much of the north wall's west section. A single-leaf steel door close to the west elevation's northwest corner also opens into the service bay. The long, horizontal window opening south of the door contains four twelve-pane steel-frame sash.

The reinforced-concrete and brick structure is exposed on the interior. Both levels have poured-concrete floors and painted brick walls. In the second story's single room, tall, deep, steel shelving units are arranged in east-west rows. The ground-level workshop also has an open plan. In the service bay, a steel ladder rises on the west wall to a mezzanine with a metal-pipe railing that spans the south elevation. Fluorescent lights, sprinkler system pipes, and ventilation system ductwork have been dropped from the ceilings. Round metal electrical conduit is mounted on the walls and ceilings.

**Western Electric Paint Shed (Building 7), 1955, 1959, Contributing Building**

The one-story, rectangular, side-gable roofed Building 7, which originally functioned as a painting facility, stands near the complex's northwest corner. The shed has an east-west orientation with the

primary entrances on the south elevation. Corrugated-metal panels sheath the walls and the roof topped with eight round ventilators. The building rests on a poured-concrete foundation.

Four large, square, sashless window openings pierce the shed's south elevation. Two original single-leaf steel doors and one replacement double-leaf metal door provide interior access. At the building's east end, a 1959 addition with concrete-block interior partition walls contains three large spray-painting bays secured by roll-up corrugated-metal service doors on the east elevation. A single-leaf door near the north elevation's east end opens into the north bay. To the west, five window openings surround a standard-height, double-width door opening and a taller, wider opening secured by enormous metal doors that slide on tracks mounted above the door opening. A concrete ramp with a metal-pipe railing leads to the double-leaf metal door at the north elevation's west end. The west elevation contains a wide, rectangular, central window opening flanked by two square window openings.

A single-bay concrete-block 1959 addition with a flat corrugated-metal roof extends from the shed's southwest corner. At its north end, a narrow concrete-block platform with a metal-pipe railing provides elevated workspace. Employees washed radar trailers in this area before moving them to the shed's main block, where they were marked prior to being spray-painted and touched up as needed after painting.

Slender steel columns, beams, and trusses comprise the shed's structural system, which is mostly exposed on the interior. The space has an open plan and poured-concrete floors. Gypsum board sheathes the walls' lower portions and the areas around doors. Above the finished areas, the batt insulation that fills the space between posts is visible. Fluorescent lights, sprinkler system pipes, and central rectangular ventilation ductwork have been dropped from the exposed steel truss roof system. The storage room at the southwest corner, erected within the past few years, has partial-height frame walls covered with particle board. On the east elevation, roll-up corrugated-metal service doors provide access to the three spray-painting bays in the 1959 addition.

**Western Electric Storage Building (Building 12), 1952, Contributing Building**

Building 12 is located north of Buildings 3 and 4 in the complex's northwest section. The one-story rectangular building has an east-west orientation with entrances on the east and west elevations. The structure served as the primary storage facility for large sections of metals that were cut to size for use in the machine shop and in the assembly of wire harnesses, circuit boards, and other products. Its Quonset hut form, developed by private contractors for the U. S. military to be easily expandable, features four low-arch-roofed, steel-frame sections. The two outer sections are slightly wider as the roof arc extends all the way to the poured-concrete foundation slab. Corrugated-metal panels sheath

the roof and walls. Round ventilators extend above the roof. Concrete pavement surrounds the structure, facilitating access.

The north bay of the west elevation contains two square, sashless window openings and a tall double-leaf service door that currently serves as the primary entrance. Two matching window openings pierce the west walls of each of the remaining three bays. The south bay originally contained a door identical to the one in the north bay, but the opening has been enclosed with corrugated-metal panels. Square, central, louvered vents remain in the wall beneath each roof arch. A metal single-bar guard rail mounted on a low concrete base wraps around the building's southwest corner.

The east elevation is similar to the west, although the south bay retains a sliding metal door. The double-leaf sliding metal door in the north bay is taller and wider, as it served the adjacent loading dock. An open steel-frame structure with a partial flat metal roof and an overhead crane projects from the north bay above the loading dock.

Square window openings—ten on the south elevation and nine on the north elevation—provide ample light. A sliding single-leaf metal door in the fourth bay from the north elevation's west end allows interior access. A formed-concrete retaining wall topped with a metal-pipe railing extends along the north elevation to ameliorate the change in grade, which slopes down to the north and east. A matching retaining wall borders the north edge of the concrete ramp near the building's northeast corner.

The structural system is exposed on the open interior. Steel columns mounted on the poured-concrete floor support the arched steel roof structure. Foam insulation has been sprayed on the roof and exterior walls. Full-height corrugated-metal panels serve as a two-bay-wide, north-south partition wall near the northwest corner. Partial-height frame partition walls sheathed with gypsum board as well as thin sheet-metal on the lower half create a small office adjacent to the north elevation near its east end. Fluorescent lights and sprinkler system pipes hang from the roof system.

Full-height corrugated-metal panels enclose the building's southeast corner. The room's west wall contains a tall, wide, sliding-metal, south door and a shorter, smaller, sliding-metal door to the north. The north wall is offset, creating more depth at the room's east end. Partial-height, gypsum-board-clad, frame walls enclose a double-leaf entrance vestibule adjacent to the north wall as well as a small room at the west wall's south end. Batt insulation has been installed on the southeast room's ceiling and south wall.

**Western Electric Laboratory, Office, Assembly, and Radar Systems Testing Building (Building 13), 1952, Contributing Building**

The large, rectangular, brick and reinforced-concrete Building 13 stands at the center of the complex's south end, immediately south of Building 2. The structure has an east-west orientation. Engineers designed the four-bay-wide and eleven-bay-long building's reinforced-concrete columns, beams, and floor slabs to support heavy equipment and minimize vibration. The two-level stepped roof increases in height from the one-and-one-half-story south bay to the two-story north bays. The upper and lower roofs, served by two freight elevators, served as radar antennae trailer testing areas.

Masons executed the east elevation, which is the most visible from Graham-Hopedale Road, in running-bond red brick above a painted formed-concrete kneewall. The north two bays are two stories in height, while the south bay is one-and-one-half stories tall. Near the wall's south end, a double-leaf steel door with glazed upper sections provides access to the room at the building's southeast corner. The entrance occupies a portion of what was originally one of two large service door openings.

At the east elevation's center, a single-leaf steel door with glazed upper sections leads to the stair vestibule. To the north, a flat-roofed metal canopy shelters the primary entrance: a replacement aluminum-frame double-leaf glazed door and transom. The canopy is a later addition. The sizable, horizontal, rectangular, window opening north of the entrance was enclosed with metal panels in the 1980s, as were the two second-story windows. Historic photographs illustrate that the original windows are three-part, steel-frame, multipane sash. Each of the north window sections has eight panes, while the second-story's south window sections comprise twelve panes. The large letters spelling "Western Electric" that were mounted to the wall between the first and second stories have been removed.

An open three-bay equipment shed supported by square steel posts and beams extends from the east elevation's south bay. The concrete retaining wall that spans the shed's south end includes two sets of concrete steps. The chain-link fence that surrounds the complex is a few feet south of the retaining wall.

In each of the north elevation's eastern nine first-story bays, brick walls originally framed two roll-up service doors. However, all of the loading dock openings have been enclosed with brick. Four narrow steel doors with four-pane upper sections and one-double leaf steel door now provide interior access. Steel steps with metal-pipe railings lead to steel landings at three entrances.

The two first-story bays at the north elevation's west end and all eleven second-story bays on the north elevation have concrete-block walls. The westernmost bay is blind at both levels. A pent aluminum

canopy shelters the steel platform that spans the two first-story bays. The second first-story bay from the west end contains a two-part, sixteen-pane, steel-frame window and a high, short, metal-louvered vent. Ten second-story bays featured bands of high windows that spanned the top of each bay. All have been enclosed with metal panels.

The west elevation also has concrete-block walls. One tall original service door remains in the south one-and-one-half-story bay. The wood-frame door is seven rows tall and eight rows wide. Wood panels comprise most of the door sections, but the third row from the bottom contains glazed panes. Roll-up metal grates secure the enormous freight elevators that occupy the west elevation's two central bays. Two single-leaf steel doors, one of which is slightly taller than the other, fill the north bay's south corner. The second-story's north bay contains high windows, while the east bay is blind.

The one-and-one-half-story south elevation has high windows at the top of each concrete-block wall. Near the elevation's east and west ends, steel steps with metal-pipe railings rise in three straight runs with central landings to the roof. Metal-pipe railings top the parapet.

***Interior***

Building 13 contained laboratory, office, and assembly space. The building's exposed structure—concrete-block partition walls and reinforced-concrete columns and beams—has been painted on the interior. Most of the first floor's west half is one large room. The south two bays are open to the one-and-one-half-story ceiling height. In this section, steel catwalks provided elevated equipment access. The north two bays are only one-story tall to allow for a full second story. Fluorescent lights, sprinkler system pipes, and ductwork hang from the ceiling. Square vinyl-composition tiles originally covered the concrete floor.

On the west room's east side, concrete-block partition walls enclose a vault with a heavy steel door and a mechanical room. In its north section, concrete-block partition walls separate two elevated, narrow rooms adjacent to the north wall from a series of gypsum-board-sheathed frame partition walls that enclose office and laboratory space. The elevated area originally served as the loading dock platform. The northwest room retains electrical equipment. In the west elevation's two central bays, the south freight elevator rose to the low roof and the north elevator terminated at the high roof.

A central corridor divides the north two bays in the first floor's east half. Offices and restrooms flank the corridor. In the women's restroom, oversized beige-glazed rectangular tiles sheath the restroom walls. Most fixtures have been removed. Square peach-colored tiles cover the men's restroom walls, while the small square mosaic floor tiles are brown, peach, orange, and pale blue.

In the 1980s, AT&T divided the east section's south bay, once open like the building's west half, into two rooms, with the west room being much larger. Both had dropped aluminum-frame ceilings with acoustical tiles and fluorescent lighting panels, but the acoustical tiles have been removed, as has the floor covering, which exposed the concrete floors.

Steel stairs with formed-concrete railings topped with metal-pipe handrails provide access to the second level from the building's east and west ends. The west stair hall opens into a central east-west corridor with large rooms on either side. The southwest room contained cubicles. In the southeast room, cubicles lined the north elevation and gypsum-board partition walls enclose offices adjacent to the south elevation. Gypsum-board partition walls also create offices flanking a central east-west corridor in the northeast area.

A small steel passenger elevator and concrete steps near the building's northeast corner lead to the one-bay-wide basement under the structure's north end. Additional steps at the building's northwest corner allow basement access from the west. Some equipment remains at the basement's east and west ends. Chain-link cages enclose central storage areas.

**Western Electric Warehouse (Building 14), 1951, Contributing Building**

Building 14 occupies the complex's southwest corner. Corrugated metal panels sheath its one-story walls and the side-gable roof, which is pierced by a central row of ventilators at the peak as well as a later series of ventilators that are lower on each roof slope. The large rectangular building has an east-west orientation and rests on a poured-concrete foundation. The structural-steel frame is twenty-one bays long and three bays deep. Concrete pavement surrounds the north and east elevations, facilitating access to service doors and loading docks. The tall chain-link fence that surrounds the parcel is only a few feet from the structure's south and west elevations.

At the east elevation's center, a tall, wide, service-door opening has been infilled with corrugated-metal siding and a standard-height, double-leaf steel door. The tall metal doors that slide on tracks mounted above the original opening height are intact. To the north, a pair of eight-pane steel-frame sash with central four-pane hoppers and a matching single sash illuminate the interior. The window openings on the wall's west end have been covered with plywood. Concrete steps with a metal-pipe railing lead to the single-leaf steel door at the east elevation's north end.

The north elevation's three eastern bays project slightly beneath a shed roof to create a loading dock with roll-up corrugated-metal doors that are elevated to allow truck access. The fourth bay from the east end contains a grade-level, roll-up, corrugated-metal service door. Many eight-pane steel-frame sash with central four-pane hoppers pierce the north elevation. Only a few have been covered with

plywood. A centrally-located single-leaf steel door, an adjacent modern roll-up service door, and a sliding corrugated-metal service door near the building's west end provide interior access.

The windows on the west and south elevations have been enclosed with interior insulation panels and exterior plywood, but it appears that the metal-frame sash are intact. Two single-leaf steel doors near the south elevation's east end allow access to the building's southeast room.

***Interior***

The riveted structural-steel frame, comprised of slender posts, beams, and closed-gable Pratt trusses, is exposed on the interior. Batt insulation fills the space between posts. The majority of the interior is open with poured-concrete floors. Gyspum-board-sheathed frame partition walls have been added to create four sizable rooms and two small storage and mechanical rooms at the building's east end, as well as a series of rooms adjacent to the west wall. Fluorescent lights, sprinkler system pipes, and ventilation ductwork, and fans hang from the exposed steel truss roof system.

In the northeast corner room, a raised concrete platform extends across the north elevation adjacent to loading docks where employees received shipments. Gypsum-board-sheathed frame partition walls with square windows enclose the space. A concrete ramp with a metal pipe and plywood-panel railing leads to the platform. An open room of approximately equal size is to the west. In that space, the dropped aluminum-frame ceiling system with acoustical tiles and fluorescent light panels has been mostly removed.

In the 1980s, AT&T updated the large southeast room with gypsum-board sheathing that covers steel posts and all walls, thus enclosing exterior windows. Single-leaf doors on the west wall lead to two small mechanical and storage rooms. Wide openings in the north partition wall provide access to the northeast rooms. The dropped aluminum-frame ceiling system with acoustical tiles and fluorescent light panels has been partially removed. The southwest room is identical in finish.

The building's center is open with the exception of a brick elevated service platform and a concrete block hydraulic elevator tower in its northeast section. The steel truss roof system and two rows of steel posts, one near the north wall and one close to the south wall, allow for an expansive interior space free of structural impediments. The space initially contained two levels of steel warehouse shelving. The mezzanine floor consisted of steel grates.

Gypsum-board-sheathed frame partition walls enclosed plant maintenance offices and restrooms flanked by storage rooms adjacent to the west wall. A chain-link fence secures the storage mezzanine

above the offices. Round steel posts supported the mezzanine, which is accessed by a straight run of steel steeps with metal-pipe railings.

**Western Electric Laboratory, Office, Assembly, and Radar Systems Testing Building (Building 16), 1959, Contributing Building**

The large, rectangular, brick and reinforced-concrete Building 16 stands at the center of the complex's north end. The six-bay-wide and thirty-one-bay-long structure has an east-west orientation, with entrances on the east, south, and west elevations. Reinforced concrete caps the running-bond brick walls. In order to accommodate rooftop testing, the building has three levels, with sections becoming progressively taller and deeper moving north. The one-and-one-half-story south section is one bay wide, the two-story central section is two bays wide, and the three-story north section is three bays wide.

The stepped east elevation faces Graham-Hopedale Road. In the south bay's upper section, a single-leaf steel door provides access to steel steps with metal railings that rise to the second-story rooftop testing area. The five south bays are blind. In the north bay, a four-part steel-frame window illuminates each of the second and third stories.

A tall one-story, flat-roofed, brick entrance bay projects from the east elevation near its center. Deep eaves shelter a single-leaf steel door with a glazed upper section and the roll-up corrugated-metal door to the north. A shorter, narrower, flat-roofed, brick room extends from the north bay.

The one-and-one-half-story section's south elevation has an exposed reinforced-concrete column-and-beam frame filled with running-bond brick above the first story. Each bay's upper section also contains two rectangular metal-louvered vents and a central, wall-mounted, aluminum light fixture. Roll-up corrugated-metal service doors originally filled the sixteen west and fourteen east bays. However, Western Electric enclosed most openings with concrete block by 1990, leaving only five original roll-up doors. In some bays, contractors added single- and double-leaf steel doors to provide interior access. In the fifteenth bay from the east end, brick sheathes the wall above two original double-leaf steel doors with glazed upper sections. The east door is wider. A concrete ramp and two-bay loading dock platform with metal-pipe railings extends from the tenth bay from the east end.

Much of the north elevation is covered with ivy and obscured by other vegetation. A deep concrete cap protects bands of four-part, steel-frame, second- and third-story windows. Each sash contains three sections of two horizontal panes. The lower section is an operable hopper. Most windows are intact, but many have been covered with insulation board from the inside.

The west elevation has the same stepped configuration as the east elevation. A flat concrete canopy projects above the five north bays at the first-story level, sheltering six entrances. A roll-up corrugated-metal service door fills the north bay. Roll-up metal grates secure three enormous freight elevators. The third bay from the south end contains a single-leaf steel door and a replacement double-leaf, glazed, aluminum-frame door. The three-story north section's north and south bays contain four-part steel-frame windows, one at each of the second- and third-story levels. The south three bays are blind. Two square metal-louvered vents pierce the two-story section's upper wall. Steel steps with metal railings rise from ground level to a landing outside the single-leaf steel door in the south bay's upper section. The stairs then turn and continue to the second-story rooftop testing area.

Two flat-roofed brick and reinforced-concrete freight elevator towers extend above the two-level rooftop testing area's west end. The elevators transported radar trailers to the roof. The south elevator serves the two-story roof while the north elevator provides access to the third-story roof. A flat-roofed storage room used to house chemicals used in the third-floor blueprint room is adjacent to and shorter than the north elevator.

At both levels, metal-pipe railings top the concrete parapet. Metal-pipe posts attach aluminum spotlights to the railings. To provide additional security, chain-link fencing spans a deep metal-pipe frame that extends up at an angle from the upper section of the second-story's south wall and its cornice. Square concrete test boxes with steel lids line the second-story roof's south edge as well as the third-story roof's north and south edges. The boxes, called doghouses, contained compressed air and power cables for the radar trailers.

In three slightly projecting entrance bays on the third-story section's south elevation, single-leaf steel doors with glazed upper sections open onto the second-story roof. Three sets of steel steps with metal-pipe railings rise in straight runs with central landings between the second-and-third-story roofs. The dense rubber membrane roof provides a firm walking surface.

***Interior***

Building 16 functioned as laboratory, office, and assembly space. The building's concrete block partition walls and reinforced-concrete columns and beams have been painted on the interior. The entire first floor was originally open, and much retains an open plan. The south bay has one-and-one-half-story-tall ceilings, while the remaining five bays are two stories in height. Steel catwalks provided elevated equipment access. Western Electric added steel-frame mezzanines in the 1970s. Fluorescent lights, sprinkler system pipes, and ductwork hang from the ceiling. Square vinyl-composition tiles originally covered the concrete floor.

A central concrete-block wall divides the first floor in half. In the east section, frame partition walls create a series of small rooms lining the north elevation that included testing areas, an electrical substation, and restrooms. The two-level mechanical equipment room near the building's northeast corner has brick interior walls. East of the equipment room, a stair hall with steel and concrete steps with metal-pipe handrails provides access to the upper levels.

At the building's center, brick and frame partition walls enclose two small rooms. In the north room, a short run of steel steps with metal-pipe railings lead to a steel-frame mezzanine adjacent to a passenger elevator. To the east, a narrow north-south corridor separates these rooms from a stair hall between the first and second floors. There is no interior access to these steps.

West of the central concrete-block partition wall, concrete-block walls create several large rooms adjacent to the south elevation. The north four bays are predominately open, although the central two bays have a steel-frame mezzanine above them. Two runs of steel steps with metal-pipe railings rise to the mezzanine, which contains offices with gypsum-board sheathed frame partition walls, vinyl-composition-tile floors, and steel-frame single-leaf wood doors. At the first story's northwest corner, brick walls enclose a two-level mechanical equipment room and electrical substation. A one-bay-wide mezzanine-level steel platform extends from the control room's east elevation. In the central bay at the building's west end, a passenger elevator and steel and concrete stairs with metal-pipe and chain-link railings provide access to the second and third stories.

On the second story, gypsum-board-sheathed frame partition walls enclose the one-bay-deep offices that line the north elevation, the adjacent corridor, and four small rooms at the building's southeast corner. Two large rooms occupy most of the south five bays. This level had dropped aluminum-frame ceilings with acoustical tiles and fluorescent lighting panels, but the acoustical tiles have been removed, as has the floor covering, which exposed the concrete floors. Gypsum board sheathes the reinforced-concrete columns below the dropped-ceiling level. The reinforced-concrete structural system is intact throughout the second and third stories.

The third floor's south two bays are predominately open, while rooms of various sizes line the double-loaded corridor in the north bays. Finishes are identical to the second story.

**Western Electric Tractor Shed (Building 21), 1943, Contributing Building**

Building 21, which has an east-west orientation, is located north of Building 5 and east of Building 6 in the complex's northeast section. The one-story shed-roofed structure has dimensional lumber rafters and wall studs, wood board roof decking, and braced, square, wood posts. Corrugated-metal panels sheath the north, east, and west elevations, as well as the roof. Sliding chain-link gates secure the east

elevation's four bays. A partial-height, chain-link, north-south wall separates the east bay from the two open center bays. A partial-height, plywood-panel, north-south wall extends across the west bay's southeast end, while full-height corrugated-metal interior walls create an enclosed room at the west bay's north end. Wide, double-hung, wood-frame, eight-over-eight-sash windows pierce the room's north and south walls. The room's entrance is on the exterior, at the west elevation's north end. Inside, plywood panels cover each wall's lower half.

**Western Electric Reservoir, 1943, Contributing Structure**

Detroit architect Albert Kahn's firm rendered plans for the round, flat-roofed, formed-concrete water reservoir adjacent to the shed's north elevation. The 200,000-gallon reservoir, approximately twenty-two-feet-tall with a forty-two-foot diameter, functioned as part of the property's fire suppression system.

**Western Electric Storage Shed (Building 22), 1972, Noncontributing Building**

Building 22, utilized for chemical and segregated metal waste storage, stands near the complex's northwest corner. The one-story, rectangular, low-side-gable-roofed structure has an east-west orientation. Corrugated-metal panels sheath the north, east, and west elevations, as well as the roof and some interior partition walls. The nine-bay-wide east elevation is open. The shed is situated on a raised poured-concrete platform to facilitate truck access. A concrete ramp with metal-pipe railings leads to the east bay, while a short straight run of concrete steps with metal-pipe railings rises to the west bay. Concrete pavement surrounds the structure's east, south, and west elevations, facilitating access to multiple loading docks. A formed-concrete retaining wall ameliorates the change in grade between Building 7 and Building 16, which is at a lower elevation.

The shed's rigid-frame steel structural system is exposed on the interior, which has poured-concrete floors. Industrial pendant lights and sprinkler system pipes have been dropped from the exposed steel roof system. The seven west bays are open with the exception of a plywood-sheathed office in the fourth bay from the west end. Corrugated-metal panels enclose two-bay-wide storage room at the structure's east end. Foam insulation has been sprayed on the storage room's interior walls. The office and storage room are inset to allow for sheltered access to the shed's full width.

**Western Electric Industrial Waste Treatment Plant (Building 23), 1973, Noncontributing Building**

A small, rectangular, flat-roofed industrial waste treatment plant stands immediately south of Building 12. The building has a formed concrete foundation and short brick walls executed in five-to-one

common bond with cast-stone coping. Two square sashless window opening pierce the south elevation. A chain-link fence secures the area east of the plant.

**Western Electric Industrial Waste Treatment Plant (Building 29), 1973, Noncontributing Building**

The industrial waste treatment plant, located north of Buildings 2 and 3, occupies the center of the complex's north section. A tall, razor-wire-topped, chain-link fence surrounds the treatment plant, reservoir, tanks, and pump house. The area is paved with concrete.

The flat-roofed, painted-concrete-block Building 29 has tall parapets capped with concrete coping on its east, west, and south elevations. The metal roof wraps around the top of the lower north wall. Concrete steps with metal-pipe railings lead to an inset concrete platform at the north elevation east end. The steel roof structure is exposed above the platform. Two tall, double-leaf, steel service doors provide access to the room south of the platform, while a single-leaf door at the platform's west end leads into the narrow central room. The control room to the west is accessible through the central room or from the west elevation, as a steel-grate walkway with metal-pipe railings wraps around the building's northwest corner.

A flat-roofed metal canopy shelters the single-leaf steel west door. Two long, horizontal, sashless window openings, one on the north elevation and one on the west elevation, illuminate the control room. The south and east elevations are blind. A rectangular concrete tank and three round steel tanks line the south elevation. A steel wall-mounted ladder near the east elevation's south end rises to the roof. A single-leaf steel door and two round steel tanks are to the north. A steel platform with metal-pipe railings provides access to the top of the tanks.

The concrete-block walls are painted throughout the interior. Two control panels occupy much of the west room, which is open with the exception of a small restroom at its southeast corner. Some acoustical tiles and fluorescent light panels have been removed from the dropped aluminum-frame ceiling system. The poured-concrete floors are in good condition. In the central and east rooms, fluorescent lights, sprinkler system pipes, and ventilation ductwork hang from the steel roof system. The central room contains two round steel tanks, a wall-mounted sink, and two metal-pipe-bordered areas. A steel spiral staircase in its northwest corner leads to the basement. The east room has an open plan.

Metal-pipe railings line the round steel reservoir west of Building 29 as well as the rotating steel walkway that spans the structure. Formed-concrete walls border two open-topped holding tanks to the north and east.

**Western Electric Pump House (Building 30), 1973, Noncontributing Building**

A small, square, flat-roofed, concrete-block pump house stands west of the waste treatment reservoir. Formed-concrete steps lead to the double-leaf steel door on the building's south elevation. Concrete coping caps the parapet walls. Steel trusses support the corrugated-metal roof. The interior pumping equipment is mounted on poured-concrete floors.

**Western Electric Liquid Waste Storage (Building 31), 1978, Noncontributing Building**

A one-story, rectangular, flat-roofed, steel-frame storage building stands north of Building 2. The one-bay-deep and four-bay-long building has an east-west orientation and rests on a concrete slab. The lower halves of the east, south, and west walls are stuccoed formed concrete, above which corrugated-metal siding sheathes the steel frame. The north elevation's westernmost bay is identical. Three double-leaf corrugated-metal doors fill the remaining bays. The surrounding area is paved with concrete.

**Water Tower, 1928, Contributing Structure**

A tall steel structure with four angled columns supports the round, conical-roofed water tank that stands north of Building 4. Horizontal struts and angled tie rods span the lattice columns. The 100,000-gallon is elevated eighty-five feet according to the January 1929 Sanborn map. A central vertical riser pipe supplies water to the tank. A fixed ladder attached to the exterior of the southeast column rises to a narrow steel balcony secured by a two-bar steel pipe railing that encircles the hemispherical bottom tank. A second ladder hangs from a swivel joint attached to a steel rod at the roof's peak. The ladder has the capability to rotate around the tower. A cast-iron finial tops the roof.

**Electrical Substation, 1959, Contributing Structure**

A chain-link fence set in concrete curbing surrounds the main electrical substation located at the complex's northwest corner. Gravel covers the ground. The substation contains automated voltage regulators and creosote-treated wood poles that carry electric lines to transformers and into buildings.

**Section 8. Statement of Significance**

The Western Electric Company – Tarheel Army Missile Plant meets National Register of Historic Places Criterion A for industry and Criterion C for architecture. The complex's primary local significance stems from its use for military-related manufacturing, product development, and testing. In February 1942, as part of a national campaign to repurpose underutilized industrial plants during World War II, the Defense Plant Corporation acquired three tracts encompassing 211.26 acres from Washington National Insurance Company. The Hagerstown, Maryland-based Fairchild Engine and Airplane Corporation immediately leased the complex and used it to manufacture twin-engine, laminated-plywood airplanes for the war effort from May 1943 through September 1944. The following month, Fairchild's Duramold Division became the Burlington plant's sole occupant. In December, Firestone Rubber announced that it would utilize the facility to manufacture ordinance for the United States Army. Firestone vacated the complex after World War II's end in August 1945.

The General Services Administration then assumed the property's management. Western Electric Company leased the plant from 1946 until 1991 and developed and manufactured sophisticated communications equipment and weapons including Nike missile guidance and anti-aircraft apparatus. The concern's contribution to the local economy as a manufacturer, employer, consumer of local goods and services, and taxpayer during this period was enormous. The plant employed up 4,500 workers when operating at full capacity. The U. S. Army Missile Command based at Redstone Arsenal in Alabama had assumed jurisdictional oversight of the Burlington facility in 1957, and in August 1963 named it Tarheel Army Missile Plant. In 2004, the federal government designated the complex surplus property and sold it to Hopedale Investment, LLC.

The Western Electric Company – Tarheel Army Missile Plant is architecturally significant due to its collection of intact mid-twentieth-century industrial buildings that display a functionalist approach in their form, massing, expressed structures, and open plans with fenestration dictated by spatial use. The nominated area encompasses fifteen buildings and three structures erected from 1928 through 1978. The Detroit architecture firm Albert Kahn Associated Architects and Engineers, Inc., designed the extant manufacturing and office building additions, power house, and reservoir erected during Fairchild Aircraft's tenure. Western Electric's New York Plant Development Division worked with engineers at the Burlington facility to design Building 13 (1952) and Building 16 (1959), which provided interior laboratory, office, and product assembly space as well as rooftop radar systems testing areas. Western Electric also erected warehouses, industrial waste treatment plants, and other auxiliary structures as needed.

The buildings employ structural systems ranging from riveted steel frames comprised of columns, beams, and trusses to reinforced-concrete columns, beams, and slabs. Brick, stucco, concrete block,

and corrugated-metal siding sheathe exterior walls. The period of significance begins in 1943 with the completion of the Kahn-designed buildings and the initiation of military-related production, and continues to 1966. Although the plant's industrial function and physical expansion continued after 1966, that period is not of exceptional significance.

**Historical Background**

Settlement in the area that would become Burlington was sporadic until the mid-nineteenth century, when the North Carolina Railroad Company purchased approximately 632 acres from landowners northwest of Graham, the Alamance County seat, to construct a support facility halfway between Goldsboro and Charlotte. The construction of repair shops, employee housing, offices, depots, and a hotel commenced in 1856. The community grew steadily, and, although development slowed during the Civil War, incorporated as Company Shops in February 1866. Changes in the North Carolina Railroad Company's organization soon impacted the flourishing town. The Richmond and Danville Railroad leased the Goldsboro-Charlotte line in 1871 and moved the railroad offices to Greensboro from Company Shops in 1875. However, the railroad route facilitated connections to market centers and increased the community's attractiveness to industrial concerns.[4]

Central Manufacturing Company established Lafayette Cotton Mills, Alamance County's first fully steam-powered textile mill, in Company Shops in 1882. E. M. Holt Plaid Mills commenced production the following year. Although Lafayette Cotton Mills closed in 1884, Aurora Cotton Mills purchased the complex and initiated operations in 1885. Elmira Cotton Mills began spinning yarn and weaving fabric in 1886. These three textile mills and Carolina Coffin Company, founded in 1884, bolstered the local economy to the point that the town was able to survive when the railroad repair shops moved to Manchester, Virginia, in 1886. An influx of laborers resulted in a ninety-seven percent population increase from 871 residents in 1880 to 1,716 citizens in 1890. A citizen's committee selected a new name, "Burlington," in February 1887 to celebrate the community's industrial renaissance, but it was not until February 14, 1893 that the city of Burlington incorporated.[5]

As Burlington businesses prospered, the population almost doubled, growing from 3,692 in 1900 to 5,932 in 1920. During the twentieth century's first decades, Aurora Cotton Mills, Burlington Mills,

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[4] Claudia P. Roberts, "Historic Resources of Burlington," Multiple Property Documentation Form, on file at the North Carolina Historic Preservation Office, Raleigh, N. C., 1983, Section 8.1-2; Durward T. Stokes, *Company Shops, The Town Built by a Railroad* (Winston Salem: John F. Blair, 1981), 10; Dr. J. A. Hunter, "Development of Burlington is Viewed From Research Work: Transition From Company Shops," Burlington *Daily Times-News* (hereafter abbreviated *DTN*), November 16, 1936; Walter Whitaker, *Centennial History of Alamance County, 1849-1949* (Burlington: Burlington Chamber of Commerce, 1949), 134; "History of Burlington, North Carolina," Alamance County, NC Convention and Visitors Bureau, http://www.visitalamance.com/history-burlington.asp, accessed in August 2015.

[5] Ibid., Section 8.4-5; Whitaker, *Centennial History of Alamance County*, 134-135.

Inc., E. M. Holt Plaid Mills, King Cotton Mills, and May Hosiery Mill expanded factories and diversified production.[6] The robust economy of the early 1920s encouraged textile innovation, and hosiery manufacturers experimented with alternative fibers that were less expensive and more durable than silk. In 1924, American Viscose Company president Samuel A. Salvage adopted the trade name "rayon" for a synthetic filament that had previously been known as artificial silk. Other producers and the Federal Trade Commission followed suit. As demand increased, entrepreneurs invested in spinning mills. Sixteen American and two Canadian plants generated rayon yarn in 1928. Two concerns began operating rayon plants in North Carolina that year. The Holland-based Enka Artificial Silk Company established America Enka Corporation in Asheville and National Life Insurance Company president Albert M. Johnson of Chicago incorporated A. M. Johnson Rayon Mills, Inc., in Delaware and opened a Burlington factory. Johnson, his wife Bessie, Cliffe U. Merriam, and National Management Corporation were the initial stockholders.[7]

Burlington Mills, Inc. began weaving rayon into its fabrics in 1924 and erected a mill specifically for rayon dress goods production in 1927.[8] This endeavor, in addition to North Carolina's favorable corporate tax rates, may have been what inspired A. M. Johnson Rayon Mills to locate in Burlington. The concern purchased multiple parcels outside the city limits in order to construct the spinning mill. Company records delineate that the concern expended $492,793 to acquire acreage between October 1927 and April 1929.[9]

A. M. Johnson Rayon Mills, Inc.'s vice president and research and chemical director Dr. Waldemar O. Mitscherling, whose primary business was W. Mitscherling Research Laboratories, in Bridgeport, Connecticut, guided the Burlington factory's planning and construction. Framingham, Massachusetts-based McNally Building Company erected the one-story brick structure completed in 1928.[10] The architect responsible for designing the mill has not been identified. The 50,000-square-foot edifice featured distinctive sawtooth roof monitors, which were common in the northeast United States and England but infrequently utilized in North Carolina.

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[6] Leon E. Truesdell, supervisor, *Sixteenth Census of the United States: 1940, Population, Volume I* (Washington, D. C.: United States Government Printing Office, 1942), 772; Leary W. Adams, "The Spirit of the Regulators Lives On," *News and Observer*, May 7, 1922; "New Cotton Mill, Hotel, School Houses Erected at Burlington," *Greensboro Daily News*, February 8, 1925; "More Payrolls Bring Greater Prosperity to Burlington," *Charlotte Observer*, March 25, 1928.

[7] Mois H. Avram, *The Rayon Industry* (New York, D. Van Nostrand Company, 1929), 39-41, 16-17, 60-61, 172; Stock certificates, Folders 2 and 3, A. M. Johnson Rayon Mills Records #5290, Southern Historical Collection, Wilson Library, University of North Carolina at Chapel Hill.

[8] Burlington Mills, "The Story of Burlington Mills," 1948 brochure.

[9] Burlington real estate transaction lists, January 20, 1929 and April 20, 1929, in "Burlington Mill Rayon No. 1," Folder 4, A. M. Johnson Rayon Mills Records.

[10] "Burlington Mill Rayon No. 1," Folder 4, A. M. Johnson Rayon Mills Records.

A. M. Johnson Rayon Mills commenced production in 1928 with two ten-hour spinning department shifts daily. The company provided round-trip transportation for female employees residing in Burlington, Graham, and Haw River, scheduling the hour-long route to coincide with breaks between shifts. By October 1929, approximately eight hundred workers generated up to 5,000 pounds of rayon yarn each day. That month, the company announced plans to enlarge the mill's footprint by almost 90,000-square-feet in order to double production capacity. The expansion was ill-timed due to the stock market crash and the ensuing depression that slowed the nation's economic growth.[11]

In early November 1929, A. M. Johnson Rayon Mills' Delaware sales office began marketing a brand of rayon yarn called "Johnsonette" produced in North Carolina. Frederick C. Niederhauser, A. M. Johnson Rayon Mills, Inc.'s second vice-president and managing director, assumed the Burlington plant's operation in February 1930. Dr. W. O. Mitscherling remained the concern's vice president. Around the same time, the plant closed for several months to facilitate new construction and equipment installation. Building material purveyors included local and national concerns such as Alamance Lumber Company, Burlington Hardware Company, Kirk Holt Hardware Company and Sykes Foundry Company of Burlington; Graham Hardware Company; North Carolina Steel and Iron Company and Odell Mill Supply of Greensboro; Fletcher Works of Philadelphia; Rockwood Sprinkler Company of Worcester, Massachusetts; and E. H. Sargent and Company of Chicago. Max Ams Chemical Engineering Corporation and Delahunty Dyeing Machine Company supplied the much of the plant's equipment. During the transition, A. M. Johnson reorganized the business as Carolina Rayon Mills, Inc., remaining its president. Despite increased production, the company could not surmount financial difficulties and closed the mill in 1931.[12]

National Management Corporation of Dover, Delaware, bought the plant and 587.73 acres from Carolina Rayon Mills, Inc., in November 1931, but held it for only four years before experiencing financial difficulties. The Chicago-based National Life Insurance Company purchased the property at a receivership sale in March 1935 and immediately conveyed it to Hercules Life Insurance Company. Both firms were Sears and Roebuck Company subsidiaries. Former Carolina Rayon Mills supervisor

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[11] A. M. Johnson began purchasing land in Burlington in November 1927 and assumed title to almost 588 acres by 1930. Alamance County Deed Book 92, p. 24; Deed Book 95, p. 586; Deed Book 97, p. 470; Letter to Dr. W. O. Mitscherling, September 25, 1929, in "Burlington Mill Rayon No. 1," Folder 4, A. M. Johnson Rayon Mills Records; "A. M. Johnson to Add Unit that Will Triple Plant," *Daily News Record*, New York City, October 21, 1929; "A. M. Johnson to Appoint Sales Director Shortly," *Daily News Record*, November 1, 1929; "Mr. and Mrs. Henderson Locate Here," *DTN*, January 22, 1930, p. 3.

[12] "A. M. Johnson Rayon to Sell Yarn Soon as 'Johnsonette'," *Daily News Record*, November 9, 1929;"Dr. Mitscherling to Establish Sales Office Here Shortly," *Daily News Record*, January 2, 1930; "New Managing Head for the Rayon Mills," *DTN*, February 26, 1930, p.1; Predicts Big Payroll Increase During Year," *DTN*, March 1, 1930, p. 1; "Rayon Plant Will Resume Operation Soon at Burlington," *Statesville Record and Landmark*, July 10, 1930, p. 5; Account Ledgers, 1929-1930, A. M. Johnson Rayon Mills Records.

Dan Rader continued to oversee the property's maintenance, engaging contractors in 1935 to paint and repair the mill and twenty adjacent company-owned houses built to accommodate mill employees. Hercules Life Insurance Company sold the mill equipment to New York-based Consolidated Products Company in 1926 and began marketing outlying acreage in 1936. That year, truck transport operator Barnwell Brothers purchased outlying five acres upon which to erect a warehouse terminal.[13]

Developers including George T. Penny Land Company of High Point expressed interest in purchasing the property, but Hercules Life Insurance Company retained ownership and engaged Burlington realtors Somers and Garrison to lease the mill. Site manager Dan Rader then became an All-State Insurance salesman for Hercules Life Insurance Company, which merged in April 1938 with Washington National Insurance Company. In June 1938, Southern Foods, Inc., established by A. H. Hughes, Ralph H. Scott, and Dr. S. F. Scott of Burlington and Baltimore investor N. F. O'Dea, rented a portion of the plant. The company utilized cotton seed oil to produce condiments. The entrepreneurs created an associated business, Southern Distributors, Inc., in December 1938 to promote the firm's product. However, the short-lived manufacturing endeavor ceased production in 1939.[14]

In August 1938, T. H. Knott leased approximately 100,000 square feet of the complex to function as a local and long-distance trucking terminal and warehouse. The mill also served seasonal tenants including amusement equipment companies, who stored rides on the site during the winter of 1938-1939. Hercules Life Insurance Company conveyed much of its Burlington property to Washington National Insurance Company in March 1939. The 35,000-square-foot mill hosted Burlington's Municipal Fair in October 1939, allowing exhibitors to set up indoor booths for the first time in the event's history. Following the fair, auctioneers sold the year's tobacco crop from the building and two Burlington warehouses for almost ten weeks.[15]

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[13] Alamance County Deed of Trust Book 103, p. 507; Deed Book 101, p. 335; Deed Book 109, pp. 268, 505, and 513; Deed Book 126, p. 466; "Carolina Rayon Plant is to Let Contract Paint," *DTN*, July 5, 1935, p. 5; "Painting, Repairing Carolina Rayon Mill Property and Houses," *DTN*, September 2, 1935, p. 4; "Carolina Rayon Property Now in Liquidation by Hercules Life of Chicago, as Owners," *DTN*, April 29, 1936, p. 7; "Barnwell Brothers Buys Track [sic] of Five Acres for the Purpose of Building Warehouse Terminal," *DTN*, October 20, 1936, p. 10.

[14] Alamance County Deed Book 123, p. 147; "Carolina Rayon Plant Reported Sold," *DTN* , June 3, 1938, p. 10; "Idle Rayon Plant in Alamance Sold," *News and Observer*, June 4, 1938;"Southern Foods is a New Industry in the Local Business," *DTN*, June 11, 1938, p. 8; "Southern Foods Recognized as One of the State's New and Unique Industries Here," *DTN*, October 14, 1938, p. 8; "New Corporation Formed to Handle Southern Products," *DTN* , December 3, 1938, p. 2; "Dan M. Rader will be All-State Agent in North Carolina," *DTN*, December 6, 1938, p. 3.

[15] Alamance County Deed Book 124, pp. 392, 394; "Truck Terminal-Warehouse Unit to be Opened September 1 in Old Rayon Plant Site," *DTN*, August 26, 1938, p. 9; "Henry Brothers to Store Rides Here During the Winter," *DTN*, November 1, 1938, p. 5; "Municipal Fair to Be Staged Inside the Rayon Grounds," *DTN*, September 15, 1939, p. 5; "Community Fair Opens Monday with Vast Array of Exhibits, Glittering Midway Attractions," *DTN*, September 30, 1939, p. 6; "Preparations for Weed Sales Move Forward Rapidly," *DTN*, October 5, 1939, p. 18; "More than a Half Million Paid Out in Tobacco Sales," *DTN*, December 19, 1939, p. 7.

Company A of the Burlington National Guard unit and the medical detachment of Graham's National Guard unit camped on the former Carolina Rayon Mills grounds during a week-long training and recruiting session in mid-September 1940. The guardsmen then reported to Camp Jackson, South Carolina for a year's active duty. Later that month, the industrial complex housed the Burlington Municipal Fair for a second year.[16]

Burlington's population grew slightly as the economy recovered, numbering12,198 in 1940, at which time 239 retail and 48 manufacturing establishments operated in the city.[17] As World War II escalated, many county residents enlisted in the military, and those left behind were occupied with the war effort in a variety of ways, from filling vacant positions in local manufacturing plants to participating in bond drives and other volunteer efforts. Industrialists pursued military contracts to support the United States's participation in the war. America's goal to become "the arsenal of democracy" benefited large corporations—more than half of the $175 billion-worth of government contracts awarded between 1940 and 1944 went to thirty-three nationally-known firms who had demonstrated their capacity to produce large quantities of quality goods—as well as small businesses, finally remedying the high unemployment rates that lingered after the economic recession of the late 1930s. Industrial jobs increased by seventy-five percent in the South over the course of World War II, with traditionally underemployed groups such as women, African Americans, and the elderly receiving invaluable education, training, and experience. Output soared after May 1943, when President Franklin D. Roosevelt established the Office of War Mobilization to coordinate a diverse array of support endeavors including manufacturing, scientific research, and agricultural production.[18]

The former Carolina Rayon Mills complex provided valuable square footage for local and federal government undertakings during World War II. In January 1942, Southern Pines merchant Francis H. Robinson, who had acquired the former Carolina Rayon Mills employee clubhouse, announced his plans to improve and donate the property to Alamance County for use as a tuberculosis sanatorium. The following month, Washington National Insurance Company conveyed three tracts encompassing 211.26 acres of the former Carolina Rayon Mills property to the Defense Plant Corporation. The Hagerstown, Maryland-based Fairchild Engine and Airplane Corporation immediately leased it for use

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[16] "Local Guard Units Set Up New Quarters at Old Rayon Plant," *DTN*, September 16, 1940, p. 5; "Guard Units Break Camp at Rayon Plant," and "Fair Plans Proceed as Most of Exhibit Space is Taken," *DTN*, September 21, 1940, p. 6.

[17] Truesdell, *Sixteenth Census of the United States: 1940, Population, Volume I*, 772; Thomas J. Fitzgerald, supervisor, *Sixteenth Census of the United States: 1940, Manufactures, 1939, Volume III* (Washington, D. C.: United States Government Printing Office, 1942), 745; Fred A. Gosnell, supervisor, *Sixteenth Census of the United States: 1940, Retail Trade, 1939, Part 3* (Washington, D. C.: United States Government Printing Office, 1941), 740.

[18] Marilyn M. Harper, et. al. *World War II and the American Home Front* (Washington, D. C.: The National Historic Landmarks Program, October 2007), 3, 13-16.

by its aircraft production division and embarked upon a renovation and expansion that doubled the mill's square footage. The Detroit architecture firm Albert Kahn Associated Architects and Engineers, Inc., prepared plans for manufacturing and office building additions, a power house, and a reservoir that are extant, as well as a guard house/fire station and an airport control tower that have been demolished. The project also involved modifications to Huffman Field, an airstrip in close proximity to the plant, to serve as an airplane testing site. Burlington contractor H. Frank Mitchell Jr. executed the work, which was subsidized by a $3 million loan through Reconstruction Finance Corporation. Governor J. Melville Broughton welcomed Fairchild executives to North Carolina at an April 7, 1942 celebration.[19]

Fairchild Engine and Airplane Corporation placed the Burlington plant into service in May 1943. Production was initially slow due to the time require to train approximately 2,350 laborers, ninety percent of whom had no prior experience with such work. However, employees fabricated about one hundred twin-engine, laminated-plywood airplanes for the U. S. Air Force's aerial gunner and bombardier training program by September 1944, when the program's funding ended. In October, Fairchild's Duramold Division became the Burlington plant's sole occupant, molding seamless fiberglass, wood, and rubber aircraft components. Duramold only occupied the site for a few months.[20]

In December 1944, Firestone Rubber announced that it would utilize the plant to manufacture ordinance—155 MM and 90MM guns—for the United States Army. Due to the highly specialized nature of the work, company representatives estimated that a projected 1200 to 1500 employees would relocate to Burlington along with the necessary production equipment. Firestone also rebuilt tanks at the site. The Burlington operation was short-lived, however, as the factory closed in August 1945 when the company's military contract ended at World War II's conclusion. The General Services Administration then assumed the plant's management and contracted with Western Electric Company, Inc., to lease the complex.[21]

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[19] The tuberculosis sanatorium began operating on July 1, 1942. Alamance County Deed Book 138, p. 227; "Surveys Made on Robinson Property by Several Defense Industries Prove Suitable for Manufacture of Airplanes," and "TB Rest Home Plans to Proceed Accordingly," *DTN*, January 20, 1942, p. 12; "Fairchild Will Launch An Aircraft Industry Here," *DTN*, February 18, 1942, p. 8; "Plans Completed for Plane Plant," *News and Observer*, February 19, 1942; Marion Brown, "Work of Converting Burlington Plant into Plane Factory Already Begun By Fairchild Corporation," *Greensboro Daily News*, February 22, 1942; "H. Frank Mitchell and Son Are Low Bidders Saturday When Official Action Was Taken at Hagerstown," and "First of Fairchild Visitors Reach Here for Program Tuesday," *DTN*, April 6, 1942, p. 7; Charles Bond, "Alamance Becomes 21st County in State with Own Tuberculosis Sanatorium as Institution is Dedicated This Afternoon," *DTN*, June 20, 1942, p. 12.

[20] Fairchild Chief Explains Delays at Plane Plant," *Durham Morning Herald*, December 10, 1943; "Burlington Firm to Feel Cutback," *News and Observer*, August 12, 1944; "Fairchild Plans to Retain Plant," *News and Observer*, October 14, 1944.

[21] "Firestone Rubber Will Manufacture Artillery Pieces at Fairchild Unit," *DTN*, December 7, 1944, p. 1.

Western Electric Company, Inc., founded in 1872, initially manufactured telegraph equipment for Western Union, becoming the United States's largest electrical parts supplier before its 1881 acquisition by Bell Telephone, which became American Telephone & Telegraph (AT&T) in 1899. Western Electric then served as AT&T's sole telephone manufacturer. On January 1, 1925, Western Electric and AT&T consolidated portions of each company's engineering departments to create a jointly-owned and managed entity, Bell Telephone Laboratories, which researched and developed communications technology. Telephone demand declined during the depression years, but increased significantly beginning with the onset of World War II in 1939, when the telephone was marketed as a "weapon of preparedness." Beginning that year, the company manufactured electronic equipment including computers and navigation, radar, and sonar systems for use in national and international defense installations. In February 1945, as the military continued to explore the most effective means of destroying enemy bombers, the U. S. Army Ordnance Department selected Western Electric and Bell Telephone Laboratories to develop a surface-to-air missile for that purpose. Research continued after the war, albeit with a dramatically reduced budget, as military spending declined exponentially from $81.5 billion in 1945 to $13.1 billion in 1947.[22]

When building materials became available at the war's end, Western Electric undertook deferred facility maintenance and expansion, capitalizing on the opportunity to utilize vacant industrial complexes throughout the country. In February 1946, the company negotiated a five-year lease for the former Carolina Rayon Mills plant in Burlington, agreeing to pay $155,988 in annual rent. On March 11th, the concern began interviewing for approximately two thousand positions. Western Electric estimated that fifty percent of the new hires would be women. Over the course of the week, 2,250 applicants pursued employment. The plant commenced manufacturing radio transmitters following worker training. By November 1947, the shop also produced microphones to be used in applications ranging from safe alarms to aircraft communication systems.[23]

Western Electric's primary North Carolina plant, which was in Winston-Salem, also began operating in 1946. The company leased the former Chatham Manufacturing Company complex on Chatham Road, and shortly after interviewing for their first nine hundred positions in April, initiated production of military communications equipment including radar and telephone components and systems. By

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[22] Albert B. Iardella, *Western Electric and the Bell System: A Survey of Service* (New York, N. Y.: Western Electric Company, Inc., 1964), 18, 35; John C. Lonnquest and David F. Winkler, *To Defend and Deter: The Legacy of the United States Cold War Missile Program* (Bodega Bay, CA: Hole in the Head Press. 2014), 16, 19.

[23] "Western Electric Leases Now Idle Alamance Plant," *News and Observer*, February 21, 1946;"Western Electric Plant Interviewers See Estimated Total 2,250 Applicants Since Offices Open Monday Afternoon," *DTN*, March 16, 1946, p. 7; "Lions Hear W. E. Plant Official Discuss Type of Products Being Made," *DTN*, October 18, 1946, p. 2; "Local Western Electric Plant is Making 12 Microphone Models Which Are Going to All Parts of Nation and World," *DTN*, November 28, 1947, p. 9.

October Western Electric employed 1,600 workers in its Winston-Salem division and had expanded into a former tobacco warehouse on Oak Street.[24]

Western Electric's Burlington plant increased production through the late 1940s, serving as an important catalyst in the city's post-war industrial expansion. Burlington Mills also provided jobs and significant economic impact, maintaining a sizable presence in the city while expanding to other locations. By 1948, the company's 28,000 employees operated seventy-two plants in seven states as well as eleven in Australia, Canada, Columbia, Cuba, and Mexico. Burlington Mills reported twenty-three million dollars in plant acquisitions and equipment improvements in 1950. That year, census takers reported Burlington's one hundred percent population increase to 24,560 residents over the course of the previous decade. The city's dramatic overall growth continued through the mid-1950s, when the Chamber of Commerce reported that the industrial workforce had multiplied by eighty percent, citywide annual payroll expenditures soared 220 percent, and building permit issuance increased 215 percent between 1946 and 1956.[25]

The United States government augmented Western Electric's defense contracts in response to the Soviet Union's August 1949 detonation of an atomic bomb. Rearmament escalated after the Korean War began in June 1950, and Western Electric continued to develop sophisticated equipment and weapons including Nike guided missile and antiaircraft apparatus. The Burlington plant manufactured Mark XV gun components for the U. S. Navy as well as T-33 and M-33 gun components for the U. S. Army. In 1951, Western Electric erected a large metal warehouse (Building 14) to accommodate increased production.[26]

The following year, Western Electric completed two new structures at the Burlington plant designed to provide Nike Ajax missile guidance system assembly and testing space. Burlington contractor Mitchell Construction Company and the Atlanta, Georgia-based Armco Drainage Corporation built the 16,000-square-foot prefabricated metal Building 12. The Western Electric's New York Plant Development Division worked with engineers at the Burlington facility to prepare plans for the 50,000-square-foot, two-story-on-basement, reinforced-concrete building executed by J. A. Jones Construction Company

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[24] James Howell Smith, *Winston-Salem in History, Volume 8: Industry and Commerce, 1896-1975* (Winston-Salem: Historic Winston-Salem, Inc., 1977), 47; Thomas Pepper, "Electronics—New Industry, People," *Winston-Salem Journal*, April 10, 1966.

[25] Burlington Chamber of Commerce, "Let's Go to Burlington, North Carolina," ca. 1959; "Burlington Mills: $23,000,000 Plant Increase," Raleigh *News and Observer*, January 4, 1951; A. C. Snow, "Burlington Project, Dream for 10 Years, Nears Reality," Raleigh *News and Observer*, January 31, 1954.

[26] David G. Buchanan and John P. Johnson, Building Technology Incorporated, "Historic Properties Report: Tarheel Army Missile Plant," prepared for the Historic American Building Survey/Historic American Engineering Record, National Park Service, U. S. Department of the Interior, July 1984, p. 22.

of Charlotte. The structure's two-level roof features two thirty-foot-long radar-equipment-testing areas. The U. S. Army Corps of Engineers supervised the project.[27]

Area residents benefited from Western Electric's support of civic organizations and institutions. The company instituted a program in conjunction with Elon College whereby students attended classes in the morning and worked the full second shift. Employment numbers remained high. In July 1952, the Burlington plant's 2,500-member work force included 900 supervisors, engineers, and clerical support staff. The facility's annual output, which had averaged more than $100 million-worth of product since 1947, was expected to more than double in 1953.[28]

Western Electric attained record sales of $1.5 billion in 1953, including military equipment contracts valued at $400 million, a sizable percentage of which was manufactured at their North Carolina Works in Burlington, Greensboro, and Winston-Salem. Western Electric's field engineering division encompassed approximately six hundred employees at seventy-seven United States locations and eleven international offices that year, but the vast majority of the company's 102,000 employees operated sixteen manufacturing plants throughout the United States. Western Electric's 1953 payroll expenditure for approximately 9,400 North Carolina workers and 700 supervisors was $40 million.[29]

In 1954, after nine years of research and development, Western Electric and Bell Telephone Laboratories perfected Nike Ajax, the U. S. military's first guided, surface-to-air, antiaircraft missile. The twenty-one-foot-long weapon, armed with a conventional warhead, had a thirty-mile range. Douglas Aircraft Company manufactured the airframes, initially at its Santa Monica, California, factory, and then at a Charlotte, North Carolina, plant beginning in 1955. Bell Telephone Laboratories supplied the guidance systems. Engineers and scientists at the Burlington plant continued to improve antiaircraft technology, developing faster, more powerful Nike Hercules missiles and guidance systems in 1956. In order to house this endeavor, Western Electric added buildings encompassing 355,000 square feet to the Burlington complex by 1957. In February of that year, the plant's research team began work on the even more advanced Nike Zeus antiballistic missile program, overseen by Burlington-based engineer S. C. Donelly.[30] The project soon necessitated more laboratory and testing facilities, resulting in the renovation of Building 13 and the 1959 construction of the expansive three-story Building 16.

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[27] "Western Electric's New Buildings In Expansion Program Completed," *DTN*, September 15, 1952, p. 5.

[28] "25 Elon Students Hold Jobs at Western Electric Plant," *DTN*, October 11, 1951, p. 11; 'Western Electric Work Here Greatly Increased," *DTN*, July 11, 1952, p. 12.

[29] Public Relations Department of the North Carolina Works, Western Electric Company, Winston-Salem, N.C., "Western Electric Large Electronics Plants in Three Cities," *The E.S.C. Quarterly*, Winter-Spring 1954, page 6.

[30] The Charlotte Army Ordnance Missile Plant manufactured Nike Hercules missiles until 1967. Lonnquest and Winkler, *To Defend and Deter*, 3, 103, 148, 157, 314; "Western Electric Plans Addition to Plant Here," *DTN*, October 28, 1968, p. B1; Iardella, *Western Electric and the Bell System*, 39-40.

In 1961, Western Electric's North Carolina operation employed 13,300 workers: 3,700 at the Burlington plant, 1,400 in Greensboro, and 8,200 in Winston-Salem. This number did not include approximately 800 Bell Telephone Laboratory employees, 382 of whom were in Burlington. The company's economic impact was significant, ranging from $88,300,000 in wages to contracts with North Carolina vendors valued at $16,000,000.[31]

Western Electric continued to serve as the primary contractor for the Nike Hercules and Zeus missile programs. In 1962, the company received contracts totaling almost six million dollars to facilitate missile research, development, and production. The Burlington plant fulfilled approximately seventy percent of a $1,588,900 contract for Hercules radar and data processing components, while General Electric Company's Syracuse, New York facility supplied the remaining thirty percent, primarily perimeter acquisition radar. The Army also awarded the Burlington plant an additional $1,449,000 contract to produce guidance equipment for Nike Hercules missiles that year.[32]

The U. S. Army Missile Command based at Redstone Arsenal in Alabama had assumed jurisdictional oversight of the Burlington complex in 1957, and in August 1963 named it Tarheel Army Missile Plant.[33] However, as Western Electric continued to lease the property from the General Services Administration, most newspapers and other non-military sources continued to refer to the property as the Western Electric plant. The company's telecommunications equipment production increased from $13 million in 1962 to $22 million in 1963, with two thousand Burlington employees engaged in that task. Although the complex was Western Electric's sole manufacturing location of "hands-free" speakerphones, the facility's primary task was Nike X antiballistic missile development. A new Department of Defense contract that year involved manufacturing underwater equipment for the U. S. Navy. By 1966, the Burlington plant also conceived, tested, and fabricated satellite guidance systems for the U. S. Air Force and the National Aeronautics and Space Administration.[34]

In 1967, Secretary of Defense Robert S. McNamara announced plans to create a $5 billion national antiballistic missile system to counter possible Chinese and Russian missile deployment. Western Electric remained the primary contractor for Nike X, with the Burlington plant's 3,700 employees

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[31] "Some Readjustment Underway in W. E. Work," and "N. C. Works Has 13,300 Employees," *DTN*, March 29, 1962, p. B1.

[32] "Nike Hercules Contract Let Through Army," *DTN*, January 19, 1962, p. B1; "Western Electric Gets Contract on Hercules," *DTN*, June 18, 1962, p. B1 ; Lonnquest and Winkler, *To Defend and Deter*, 167.

[33] General Services Administration, "Tarheel Army Missile Plant, 204 N. Graham-Hopedale Road, Burlington (Alamance County), NC, Status Report as of February 1993," Federal Property Resources Service, Office of Real Estate Sales, Region 4, Atlanta, Georgia.

[34] "WE Phone Output Shows Gain," *DTN*, April 2, 1964, p. B1; "WE Makes Guidance System," *DTN*, June 25, 1966, p. B6; "Satellite Guided By WE System," *DTN*, September 28, 1967, p. D3.

leading the research and development initiative. Workers also manufactured Sprint and Spartan missile guidance systems and electric parts and assemblies for data processors.[35]

In 1969, Shaddrick Construction Company of Thomasville executed $322,787 worth of improvements that included modifications to the paint shop (Building 7), the creation of a digital rack test area at Building 16's west end, and the installation of a deep tank in which electrical cabinets could be submerged in cleaning chemicals. The Nike X program—renamed Nike Sentinel when the missile entered production—soon required more square footage for research and development. In order to accommodate this, Western Electric moved administrative offices and employee service areas into a two-story, brick, 50,000-square-foot addition finished in 1970. The Savannah District Army Corps of Engineers supervised the construction of the structure designed by Asheville architects Six Associates, Inc., to house offices and a cafeteria.[36]

Western Electric next expanded its North Carolina operation to Guilford Center, a research and engineering complex erected on Mt. Hope Church Road near I-85. On the facility's 1971 completion, the company transferred approximately six hundred Western Electric and Bell Laboratories workers from Burlington to Guilford County. The Burlington plant experienced further reduction in force in October 1972, when the U. S. Army significantly reduced the scope of its Safeguard ballistic missile defense system following the strategic arms limitation treaty (SALT). Contract cancellations required immediate project cessation, resulting in temporary lay-offs for 250 workers and a projected permanent loss of an additional 150 positions.[37]

Employment at the Burlington plant continued to decline in subsequent years, numbering 2,450 at the end of 1974 and 1,775 in December 1975. That month, Western Electric announced plans to eliminate 1,200 Burlington jobs by June 1976 and move telecommunications equipment production to its Old Lexington Road plant in Winston-Salem. However, the company continued to update the Burlington plant as needed. Burlington engineers and architects Alley, Williams, Carmen, and King facilitated minor renovations and mechanical system updates in 1982. The Old Lexington Road plant employed thousands through 1988, when AT&T consolidated production in Burlington. Only four hundred employees worked at the Winston-Salem facility at the end of 1989. AT&T closed the Burlington plant in late 1991, but continued to perform routine maintenance for the General Services Administration.[38]

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[35] Bob Horton, "Production of Nike X to Cost $5 Billion," and A. Howard White, "WR To Remain Prime Contractor for Nike X," *DTN*, September 19, 1967, p. 1; Committee on Appropriations, United States Senate, *Department of Defense Appropriations for Fiscal Year 1970* (Washington, D. C.: U. S. Government Printing Office, 1969), 520.

[36] "Western Electric Plans Addition to Plant Here," *DTN*, October 28, 1968, p. B1; "WE Work Bids Received," *DTN*, June 9, 1969, p. B1.

[37] "WE Center Opens Soon," *DTN*, January 21, 1971, p. B1; "WE Situation Will Affect 400 Workers in Local Plants," *DTN*, October 6, 1972, p. B1.

[38] George Stein, "Sources: 1,200 Western Jobs to Go," *DTN*, December 11, 1977, p. 1.

Following an environmental evaluation that deemed the property environmentally suitable for transfer, the federal government deemed Tarheel Army Missile Plant surplus property. On November 29, 2004, the General Services Administration sold the plant and 22.04 acres for $1,585,000 to Hopedale Investment, LLC, of Burlington. That concern conveyed the property to Saucier, Inc., of Tallassee, Alabama on August 24, 2013.[39]

**Industrial Architecture Context**

In the first purpose-built industrial buildings erected in the United States, designers strove to accommodate machinery in a manner that allowed for efficient access to power sources as well as maximum utilization of natural light and ventilation. By the mid-nineteenth century, "slow-burn" masonry construction, with load-bearing brick walls, exposed heavy-timber framing, thick plank floors, gabled roofs, large operable windows and transoms, and metal fire doors predominated.[40] During the late nineteenth century, steam and electric power availability encouraged factory movement to urban areas in close proximity to railroad lines and sizable potential employee pools. Mill and factory design evolved from a vernacular process whereby owners worked with builders who erected edifices based on mutually understood norms to a field dominated by professionally-trained engineers who rendered plans for industrial buildings and supervised their execution.[41]

Standards imposed by machinery manufacturers and insurance companies also guided industrial architecture's evolution. In order to minimize fire risk, stairwells, which could serve as conduits for fire movement between floors, were located in projecting stair towers. Brick interior walls and galvanized-sheet-metal-clad, solid-core-wood doors, known as kalamein doors, separated the mill sections where fires might start or spread rapidly.[42] These heavy doors would automatically close in the case of a fire, as the heat would melt a soft metal link in the door's counterweight assembly and the door would slide shut on the sloped metal track. As an additional precaution, water reservoirs and elevated water tanks supplied automatic sprinkler systems in many industrial complexes.

As the twentieth century dawned, architects and engineers continued to plan manufacturing complexes with function rather than aesthetics in mind. However, new building materials, technology, and forms

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[39] Alamance County Deed Book 2169, p. 675; Deed Book 3256, p. 582.

[40] Sara E. Wermiel, "Heavy Timber Framing in Late-Nineteenth-Century Commercial and Industrial Buildings," *APT Bulletin: Journal of Preservation Technology*, Volume 35, No. 1, 2004, 56.

[41] Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States* (Oxford: Oxford University Press, 1999), 15-21; "Piedmont Manufacturing Company," http://www.nps.gov/history/nhl/DOE_dedesignations/Piedmont.htm, accessed in February 2011.

[42] Brent D. Glass, *The Textile Industry in North Carolina: A History* (Raleigh: Division of Archives and History, North Carolina Department of Cultural Resources, 1992), 38.

manifested efficiency, modernity, and economic progress. Mill and factory designers began to specify steel and reinforced-concrete columns and beams in conjunction with brick, concrete, terra cotta block, or tile curtain walls that provided structural bracing but did not carry any weight. Bands of steel-frame multipane windows and roof monitors provided workers with abundant light and ventilation. Steel truss roof systems spanned open interiors that accommodated sizable equipment and allowed for flexibility as manufacturing needs changed.[43]

Although structural systems for some late-nineteenth-century industrial buildings included cast-iron or wrought-iron columns or steel posts and beams, high cost greatly limited the materials' use until the early twentieth century. The ability to withstand the weight and vibrations of heavy machinery without failing contributed to the popularity of structural-steel construction, as did the ease of fabricating framing systems from standard factory-generated parts. Typical elements include I-, T-, H-, and box-shaped columns and beams; round posts; and reinforcing plates, angles, and webs. Steel components could be riveted together, creating strong connections, and tended to be smaller and lighter than heavy-timber or iron framing members. This allowed for wider and taller buildings with more square footage for equipment. The popularity of flat roofs and sizable roof monitors also resulted in structural-steel framing prevalence. In order to reduce oxidation and achieve fire resistance, steel members were coated with intumescent paint; sprayed with a thin mixture of cement, sand, and water called gunite; or encased in concrete.[44]

Concrete construction technology also improved during the early twentieth century. Engineer Claude A. P. Turner patented a structural system comprised of concrete mushroom columns and formed-concrete floors in 1908 after utilizing it in his plans for Minneapolis's 1906 Johnson-Bovey Building. He then designed the first American bridge supported by the columns, which carried Lafayette Avenue over the Soo Line in St. Paul, Minnesota. The Cameron Avenue Bridge over Falling Branch Creek in Winston-Salem, completed in 1920, possesses statewide engineering significance as North Carolina's only such structure employing reinforced-concrete mushroom columns to carry a concrete slab span. Few extant examples have been documented nationally. The technology was often used in mill construction, however, appearing in North Carolina factories such as those erected in Winston-Salem by R. J. Reynolds Tobacco Company beginning in 1915 and the six-story knitting mill that P. H. Hanes Knitting Company built in 1921.[45] As industrial architecture began to reflect a Modernist influence,

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[43] Bradley, *The Works*, 144-147.

[44] Ibid.

[45] As construction drawings for the Cameron Avenue Bridge have not been located, the engineer is unknown. However, R. J. Reynolds Tobacco Company commissioned the bridge's construction as part of its development of the surrounding neighborhood for its employees. J. E. Sirrine and Company, architects and engineers of many of the company's structures, specified mushroom columns for buildings erected during that period. A. S. Macolmson, "The Mushroom System of Reinforced Concrete Building Construction," *Engineering-Contracting*, September 4, 1907, p. 137; Lichtenstein Consulting Engineers, Inc., "Bridge ID No. 330373," North Carolina Department of Transportation Historic

architects and engineers specified reinforced-concrete structural systems, previously disparaged as unattractive, for innovative applications. Architect Frank Lloyd Wright famously utilized mushroom columns as a central design element of the S. C. Johnson and Son, Inc., Administration Building (1936-1939) in Racine, Wisconsin, a sprawling concrete, steel, brick, and glass International Style complex.

Modernist architectural principles such as simplicity, efficiency, affordability, and intrinsic material expression were inherently applicable to industrial buildings. Edifices designed by Albert Kahn's Detroit office display a functionalist approach in their form, massing, articulated structures, and open plans with fenestration that is dictated by spatial use rather than symmetry. Kahn replaced traditional load-bearing walls with curtain walls containing large steel-frame windows and used monitor roofs to provide illumination and ventilation. Frank Lloyd Wright, inspired by Japanese architecture, also promoted horizontal massing, spare detailing, and visual connectivity between interior and exterior spaces. Their work, and that of European architects including Walter Gropius, whose streamlined design for the 1911 Fagus Factory in Germany features steel-frame multipane curtain walls, exemplified Modernist precepts.[46] Industrial architecture continued to reflect these tenets as the twentieth century progressed.

**Joseph Emory Sirrine - J. E. Sirrine and Company**

The architect responsible for designing A. M. Johnson Rayon Mills, Inc.'s 1928 Burlington mill and its 1930 expansion has not been identified. However, in a March 14, 1930, interoffice memorandum regarding necessary sanitary sewer system improvements, P. R. Duffey reports to F. C. Niederhauser that he has consulted with the "J. E. Sirrine Co." to determine the cost of a water filtration plant.[47] It is therefore possible that the prolific Greenville, South Carolina-based firm designed the mill and its addition, particularly as the company had nearby commissions at the time. Sirrine guided Tabardrey Manufacturing Company's 1928 plant updates in Haw River for the Cone family. The firm had

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Bridge Inventory Report, 2003; Nannie M. Tilley, *The R. J. Reynolds Tobacco Company* (Chapel Hill: University of North Carolina Press, 1985), 307; *Manufacturers' Record*, August 26, 1915 and October 14, 1915; Anita Scism and Spencer Gung, "R. J. R. Downtown Buildings, 1875-1950: A Historical Perspective," unpublished report prepared for R. J. Reynolds Tobacco Company, March 12, 2002.

[46] Gropius, the highly influential founder of the German design school known as the Bauhaus, which operated from 1919 until 1933, taught at Harvard's Graduate School of Design beginning in 1937. His personal residence in Lincoln, Massachusetts, erected in 1937, epitomizes Bauhaus philosophy. Bradley, *The Works*, 250; Henry-Russell Hitchcock Jr. and Philip Johnson, *The International Style: Architecture since 1922* (New York, W. W. Norton & Company, 1932, 20; Henry-Russell Hitchcock Jr., *In the Nature of Materials: The Buildings of Frank Lloyd Wright, 1887-1941* (New York: Da Capo Press, Inc., 1942), 52, 92-93, Figures 99 and 328-338; "Gropius House," http://www.historicnewengland.org/visit/homes/gropius.htm (accessed August 2015).

[47] "Burlington Mill Rayon No. 1," Folder 4, A. M. Johnson Rayon Mills Records.

established a prior relationship with the Cones prior through its design of buildings for Proximity Manufacturing Company, Proximity Print Works, Revolution Cotton Mills, and White Oak Cotton Mills, all in Greensboro.[48] The 1928 Burlington rayon mill manifests J. E. Sirrine and Company's typical use of riveted structural-steel columns, beams, and trusses in conjunction with brick exterior walls in order to create fire-resistant, flexible work spaces.

Joseph E. Sirrine had a long history in the Carolinas. Beginning in 1876, his family resided in Greenville, where he matriculated at the Greensville Military Academy. He then attained a Bachelor of Science degree from Furman University in 1890 and began working as a civil engineer. Four years later, Sirrine supervised construction of a Greenville mill for one of the nation's most prominent industrial engineering firms, Lockwood, Greene, and Company. He remained in Greenville and managed the firm's Southern textile mill commissions from 1899 until 1902, when he established an independent office. Sirrine's endeavor was successful, and in 1921, with eight associates, he incorporated J. E. Sirrine and Company. His role in the textile industry was more complex than that of many engineers, as Sirrine served as a director on the managing boards of twenty-three milling concerns. A comprehensive list of his commissions does not exist, but trade publications and newspaper articles allow for many attributions.[49]

**Albert Kahn – Albert Kahn Associated Architects and Engineers, Inc.**

Albert Kahn was one of only a few American architects who specialized in early-twentieth-century industrial building design. Kahn, born in Rhaunen, Germany on March 21, 1869, emigrated in 1880 to the United States, where his family soon settled in Detroit. After completing the seventh grade, he undertook odd jobs, becoming an office boy for architects George DeWitt Mason and Zachariah Rice in 1885. He subsequently developed drafting skills with Mason's guidance. A $500 scholarship from *American Architect and Building News* afforded Kahn the opportunity to study in Europe from 1891 to 1892. He initially remained with Mason and Rice after his return, but in 1895 established the first of a series of practices with partners including Alexander B. Trowbridge, George W. Nettleton, and Ernest Wilby. His brother Julius Kahn, a University of Michigan-educated engineer who had been employed with the U. S. Navy and the U. S. Army Corps of Engineers for seven years, joined the firm in 1903. The siblings' collaboration on Packard Motor Company's Building Number 10 (1905) in Detroit

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[48] "Work of Remodeling Cotton Mill Started," *DTN*, December 12, 1928, p. 1; John E. Wells, "Joseph Emory Sirrine," *North Carolina Architects and Builders: A Biographical Dictionary*, 2009, http://ncarchitects.lib.ncsu.edu/people/P000303 (accessed August 2015).

[49] *Commerce and Finance*, November 14, 1923; *Manufacturers' Record*, March 26, 1925; Clemson Textile School, "Mr. J. E. Sirrine Passes," *The Bobbin and Beaker*, Vol. 6, No. 1, 1947, 3, 20; Wells, "Joseph Emory Sirrine."

displayed their pioneering experimentation with reinforced-concrete structural systems.[50]

Kahn's Detroit office designed hundreds of factories for American industrialists including automobile manufacturers Packard, Chrysler, Ford, and General Motors, as well as for international clients. At the Packard Motor Car Company Forge Shop (1910), Kahn used a steel structural frame to support a traveling crane mounted to the roof trusses and glass curtain walls to allow for maximum light and ventilation. He minimized the exterior walls' bay articulation by using narrow steel columns of about the same size as steel window sashes. Kahn's firm continued to employ bands of steel windows in conjunction with masonry or concrete screens to conceal steel structural framing in edifices such as the Industrial Works (ca. 1915) in Bay City, Michigan, and Ford Motor Company's Charlotte, North Carolina, assembly plant (1924). The firm's Dodge Half-Ton Truck Plant in Detroit, completed in 1937, was a much more sophisticated building with tall glazed curtain walls reminiscent of Walter Gropius's Bauhaus School (1926) in Dessau, Germany.[51]

Kahn's pragmatic approach to industrial building design—manifested in brick, concrete, and steel structures with minimal embellishment, bands of large steel-frame windows, and open plans—was also applicable to defense-related projects. The U. S. military awarded the firm numerous commissions for airfields, hangars, camps, and warehouses during World War I and continued to employ them for decades. Kahn's endeavors at what is now Langley Air Force Base in Virginia include the one-story, brick, front-gable-roofed, 1919 Aero Repair Building, which features ornamental brickwork in its gables, but otherwise exemplifies his functional design tenets. The U. S. Army Air Corps engaged the firm to prepare plans for a series of austere, one-story, brick, flat- and gable-roofed laboratory and test buildings erected at Wright Field near Dayton, Ohio, between 1927 and 1934.[52]

Kahn's international oeuvre burgeoned with 521 Russian factories built from 1929 to 1932. In 1938, the firm's American industrial commissions constituted nineteen percent of the country's total for such buildings. Kahn oversaw the completion of projects valued at $200 million between 1930 and 1940, when he incorporated his firm as Albert Kahn Associated Architects and Engineers, Inc. As defense contracts proliferated in response to World War II, the firm designed projects worth an estimated $500 million from 1941 to 1946. U. S. Navy commissions included bases in Alaska, Hawaii, Midway Island,

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[50] "Albert Kahn Biography," Finding aid for Albert Kahn Papers, 1896-2014, Bentley Historical Library, University of Michigan, http://quod.lib.umich.edu/b/bhlead/umich-bhl-0420?rgn=main;view=text (accessed August 2015).

[51] "Art: Industrial Architect," *Time*, August 8, 1938; Bradley, *The Works*, 248, 248-258; Ryan L. Sumner, "Ford Motor Company Assembly Plant /Quartermaster Depot /Charlotte Army Missile Plant," Local historic landmark application prepared for the Charlotte-Mecklenburg Historic Landmarks Commission, July 1, 2002.

[52] Roy Hampton, with contributions from Maria Burkett and Christine Trebellas, Hardlines Design Company, "Historic Context for Evaluating Mid-century Modern Military Buildings," Department of Defense Legacy Resource Management Program Project Number 11-448, May 22, 2012, pp. 14, 16 ; "Albert Kahn Dies; Famous Architect," *New York Times*, December 9, 1942, p. 27.

and Puerto Rico. In many cases, the firm planned new or modified existing factories for private-sector companies with government contracts. Ford Motor Company's 1941 Willow Run Bomber Plant in Ypsilanti, Michigan, encompassed five million square feet of manufacturing space, an airport, and employee housing. Curtiss-Wright Corporation commissioned Albert Kahn Associated Architects and Engineers, Inc. to render drawings for its 1942 St. Louis, Missouri, airplane factory. The firm's work at Fairchild Engine and Airplane Corporation's Burlington, North Carolina, facility comprised manufacturing and office building additions, a power house, and a reservoir that are extant, as well as a guard house/fire station and an airport control tower that have been demolished. Prior to Kahn's death on December 8, 1942, the firm executed approximately two thousand projects, over one thousand of which were for Ford Motor Company.[53]

**Six Associates, Inc.**

Western North Carolina architects William Waldo Dodge Jr., Henry Irvin Gaines, Anthony Lord, William Stewart Rodgers, Erle G. Stillwell, and Charles Waddell incorporated Six Associates in 1942 in order to bolster their chances of obtaining government contracts. The approach succeeded, and the firm subsequently designed commercial, educational, institutional, and industrial buildings in North Carolina and throughout the southeast. Six Associates' industrial oeuvre includes Buncombe County commissions such as American Enka Corporation's ca. 1956-1957 administration building in Enka and the 1966 Gerber Company Products Plant in Asheville. Much of the firm's work, including the 1970 office, infirmary, and a cafeteria building at Western Electric Company's Burlington plant, manifests a Modernist influence. Six Associates operated under its original name until the mid-1990s. Following several subsequent mergers, Callaway Johnson Moore and West, now CJMW, acquired the practice in 2002.[54]

**Industrial Architecture in Burlington**

Burlington's rapid late nineteenth- and early twentieth-century industrial growth greatly influenced the city's development. In order to take advantage of lower land prices and allow for unfettered expansion, industrialists typically erected mills and worker housing on the town's outskirts. These complexes

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[53] Ibid.; "The Arsenal of Democracy," http://www.savethebomberplant.org/save-a-piece-of-history/ (accessed August 2015); "Architecture for War Production: A Military Aircraft Plant in the East, by Albert Kahn," *Architectural Record* (June 1942), pp. 43-52; "Albert Kahn Dies; Famous Architect," *New York Times*, December 9, 1942, p. 27; "Albert Kahn, Architect, 1869-1942," *Architectural Record* (January 1943), pp. 14-16; "Albert Kahn Associated Architects and Engineers, Inc.," Questionnaire for Architects Roster and/or Register of Architects Qualified for Federal Public Works, October 16, 1946, American Institute of Architects Archives, Washington, D. C.

[54] Charlotte V. Brown and William B. Bushong, "Six Associates," *North Carolina Architects and Builders: A Biographical Dictionary*, 2010, http://ncarchitects.lib.ncsu.edu/people/P000099 (accessed August 2015); "Western Electric Plans Addition to Plant Here," *DTN*, October 28, 1968, p. B1; "WE Work Bids Received," *DTN*, June 9, 1969, p. B1.

evolved over time. By 1982, when historian Allison Harris Black completed a survey of Burlington's historic architecture, many early mills had been demolished or encapsulated within later additions. Examples that she included in the 1987 publication *An Architectural History of Burlington, North Carolina* are Aurora Cotton Mills, E. M. Holt Plaid Mills, Elmira Cotton Mills, Lakeside Cotton Mill, May Hosiery Mill, and Windsor Cotton Mill – King Cotton Mills. All began functioning during the late nineteenth century and were subsequently expanded.

E. M. Holt Plaid Mills and May Hosiery Mill are comparable to the Western Electric Company – Tarheel Army Missile Plant in that the complexes manifest the evolution of industrial building technology as the twentieth century progressed. All include steel-frame buildings erected from the 1920s through the 1950s that originally had large multipane steel-frame windows. Sections of each mill utilized sawtooth roof monitors, which consist of a sloped south face and an almost-vertical north face with bands of tall windows, to allow more light to penetrate interior spaces. Such monitors were common in the northeast United States and England but infrequently utilized in North Carolina. At each plant, buildings constructed in the mid-twentieth century display a Modernist influence in their functionalist design, spare detailing, and exposed structural systems.

E. M. Holt Plaid Mills began weaving "Alamance Plaids" on West Webb Avenue in 1883 and continued producing gingham fabric until 1931, when the company transitioned to cotton yarn spinning. The plant includes two of Burlington's earliest extant industrial buildings: a one-story-on-basement, low-gable-roofed, brick and heavy-timber-frame 1883 mill executed in five-to-one common bond with segmental-arched windows and stone quoins and the similar two-story brick finishing building erected to the east between 1914 and 1918. Around 1924, the company built a two-story sawtooth-roofed west addition that more than doubled the main mill's size as well as the two-story, brick, Classical Revival-style office that projects from the south elevation of the complex's east building. E. M. Holt Plaid Mills became an L. Banks Holt Manufacturing Company subsidiary in the 1920s. Burlington Industries purchased the concern in 1939 and constructed the expansive 1951 Art Moderne-style one-story-on-basement brick addition that fills the lot's west half to increase weaving, shipping, and storage capabilities.[55]

The 1951 plant epitomizes the Modernist aesthetic in its horizontal massing, flat roof, asymmetrical façades, decorative brick banding, curved entrance walls, and glass block and steel-frame windows. All of the windows in the earlier manufacturing sections were enclosed with brick in conjunction with the 1951 updates. Later additions include a windowless brick structure that extends from the 1951

[55] Sanborn Map Company, "Burlington, North Carolina," Sheet 6, April 1924, January 1929, March 1948, and 1952; " '50 Payroll 10 Million Jump in Year," *DTN*, January 29, 1951, p. D1; Allison Harris Black, *An Architectural History of Burlington, North Carolina* (Burlington: City of Burlington, 1987), 65-66; Whitaker, *Centennial History of Alamance County*, 165.

addition's east elevation and corrugated-metal-sheathed steel-frame loading docks in the complex's northeast quadrant. The sawtooth roof on the circa 1924 addition has been replaced with a low gable roof.

In December 1928, May Hosiery Mills installed equipment in a newly finished one-story red brick mill at what is now 612 South Main Street. The almost-square building had large sawtooth roof monitors, which were replicated in the two-story, brick, 1930s addition to the south that doubled the mill's size. In September 1939, the company completed a two-story warehouse and office addition measuring 20-by-100-feet at the mill's south end at a cost of approximately $20,000. The complex then spanned the block between South Main and South Spring Streets and connected with its heating plant, originally a freestanding building. A tall blonde brick smokestack rises above the warehouse. May Hosiery Mills, McEwen Knitting Company, and four other textile manufacturers merged to create a new corporation in the fall of 1940, but maintained independent operations. Burlington Industries acquired the concern in 1948.[56] Subsequent modifications include the construction of a circa 1960s windowless office addition at the mill's north end and window enclosure throughout most of the mill. The 1939 addition retains large multipane steel-frame windows, although the glass has been painted. Metal panels cover the sawtooth roof monitors and corrugated-metal siding sheathes the office addition's upper wall sections.

Western Electric Company – Tarheel Army Missile Plant is Burlington's most intact mid-twentieth-century industrial complex. The 1943 buildings designed by Albert Kahn Associated Architects and Engineers, Inc., and the 1950s edifices rendered by Western Electric Company's Factory Planning and Plant Engineering Department exemplify functionalist design tenets. The brick, concrete, and steel structures exhibit minimal embellishment, open plans in the manufacturing and warehouse areas, and adaptable office and laboratory space. Steel and reinforced-concrete structural elements are visible on the interior. The multipane steel-frame windows and sizable roof monitors are significant survivals. As the buildings were not originally air-conditioned, large windows were imperative to provide light and ventilation.

In order to illuminate the narrow, one-story, red brick, 1943 office addition (Building 1), Kahn's firm specified a sawtooth roof supported by riveted structural-steel trusses. The double truss system, wherein a heavy transverse truss supports the window walls' lightweight longitudinal trusses and connects the sawtooth roof ridges, did not require interior support columns.[57] The sawtooth roof is intact and

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[56] "Another Full Fashion Plant for Burlington," *DTN*, December 12, 1928, p. 1: "May Addition is Ready for Use as Storage Unit," *DTN*, September 7, 1939, p. 17; "May and McEwen Industries Propose Merger," *DTN*, July 16, 1940, p. 5; Sanborn Map Company, "Burlington, North Carolina," Sheet 3, January 1929, March 1948; Whitaker, *Centennial History of Alamance County*, 169.

[57] Bradley, *The Works*, 193.

visible in the building's north section. Western Electric modified Building 1 in conjunction with the 1970 construction of the office addition to the east. Alterations include removal of the entrance pavilion at the east elevation's center, demolition of the east wall's north section to allow for connectivity between the kitchen and cafeteria, and window and door enclosure with brick on the north and south elevations.

Building 4 displays characteristics of the standard landplane hangar design developed by the Kahn firm for the United States military during World War II.[58] Brick and stucco walls and two bands of steel-frame windows sheath the structural-steel frame. The hangar interior rises to a two-story height and is open to the flat roof monitors to allow for ample light and airplane assembly. Steel I-beams, round steel columns, and steel trusses are exposed throughout. An overhead bridge crane system lifted heavy aircraft components and the building's poured concrete floor provided a durable work surface. The reinforced-concrete mushroom columns that support the ground floor's heavy load are visible in the basement.

The 1943 power plant (Building 5) building epitomizes Modernist industrial design precepts, as its form reflects its function. The stepped three-level roof gradually increases in height from the one-story south bay to the three-story north bay, allowing for sizable equipment. The exterior is simply executed—brick walls laid in five-to-one common bond capped with metal coping—but Kahn's firm specified the use of long horizontal and tall narrow recessed brick panels to add aesthetic interest.

Western Electric's New York Plant Development Division worked with engineers at the Burlington facility to design Building 13 (1952) and Building 16 (1959), which provided interior laboratory, office, and product assembly space as well as rooftop radar systems testing areas. The large rectangular structures' exposed reinforced-concrete columns, beams, and floors supported heavy equipment and minimized vibration. The buildings have stepped roofs, with sections becoming progressively taller and deeper moving north. The first floor's high ceiling and open floor plan accommodated sizable equipment, while the second- and third-story offices and laboratories have dropped ceilings and partition walls. Large freight elevators conveyed radar antennae trailers from the first floor to the roof in order to verify that the radar signal transmittal equipment functioned properly.

Rooftop testing was necessary due to the potent energy generated by antennae used in Nike missile systems. Antennae were only powered at high elevations outside and were always aimed skyward. Western Electric developed and tested three types of antennae in Buildings 13 and 16: search antennae, which rotated while seeking an aircraft target; target antennae, which locked on target aircraft; and missile antennae, which tracked missiles to targets based on an intercept path plotted by computers

[58] Michael A. Pedrotty, Julie L. Webster, and Aaron R. Chmiel, *Historical and Architectural Overview of Military Aircraft Hangars* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 6-3.

located in vans associated with the systems. The vertical separation created by Buildings 13 and 16's high and low roof levels allowed for differential energy distribution, which facilitated simultaneous testing of multiple systems. The search antennae were always tested on the high roofs, while target and missile antennae trials occurred at both levels.

While being tested, antennae received electronic signals from two towers. The tower on Building 2's south elevation served Building 16's rooftop testing area. A no-longer-extant tower located on leased property south of Building 13 and Highway 70 transmitted signals to antennae tested on Building 13's roof. After the electronic equipment in an antenna locked on a target, an optical telescope could be aligned with a visual target on a tower. When portable Nike systems were activated in the field, electronics and telescopes worked concurrently to aim antennae at targets. Western Electric contracted with light aircraft operators to fly patterns above the facility during final systems tests.

The warehouses that Western Electric erected as needed to accommodate production epitomize the cost-effective and expedient framing technology afforded by standard factory-generated steel components. Building 14 (1951) and Building 7 (1955) have riveted structural-steel frames comprised of slender posts, beams, and closed-gable Pratt trusses that are exposed on the open-plan interiors. The utilitarian buildings are sheathed with corrugated-metal exterior panels and rest on poured-concrete foundations.

Building 12 (1952) has a Quonset hut form, developed by private contractors for the U. S. military to be easily expandable. The Burlington warehouse features four low-arch-roofed, steel-frame sections sheathed with corrugated-metal panels. The two outer sections are slightly wider as the roof arc extends all the way to the poured-concrete foundation slab.

Building 22 (1972), which has seven west open bays, is also clad with corrugated-metal panels and rests on a poured-concrete foundation, but features a rigid steel frame. In this type of structure, most members are welded together as part of the manufacturing process and shipped as complete units rather being connected with rivets during field assembly. Although some on-site welding is still needed, this technology facilitated expedited building construction.[59]

[59] Leonard Michaels, *Contemporary Structure in Architecture* (New York: Reinhold Publishing Corporation, 1950), 41.

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**Section 10. Geographical Data**

**Latitude/Longitude Coordinates**

| | | |
|---|---|---|
| 1. | Latitude: 36.099116 | Longitude: -79.405977 |
| 2. | Latitude: 36.096620 | Longitude: -79.406106 |
| 3. | Latitude: 36.096490 | Longitude: -79.409499 |
| 4. | Latitude: 36.098995 | Longitude: -79.409603 |

**Verbal Boundary Description**

The boundaries of the - Western Electric Company are indicated by the bold line on the enclosed map. Scale approximately 1" = 200'

**Boundary Justification**

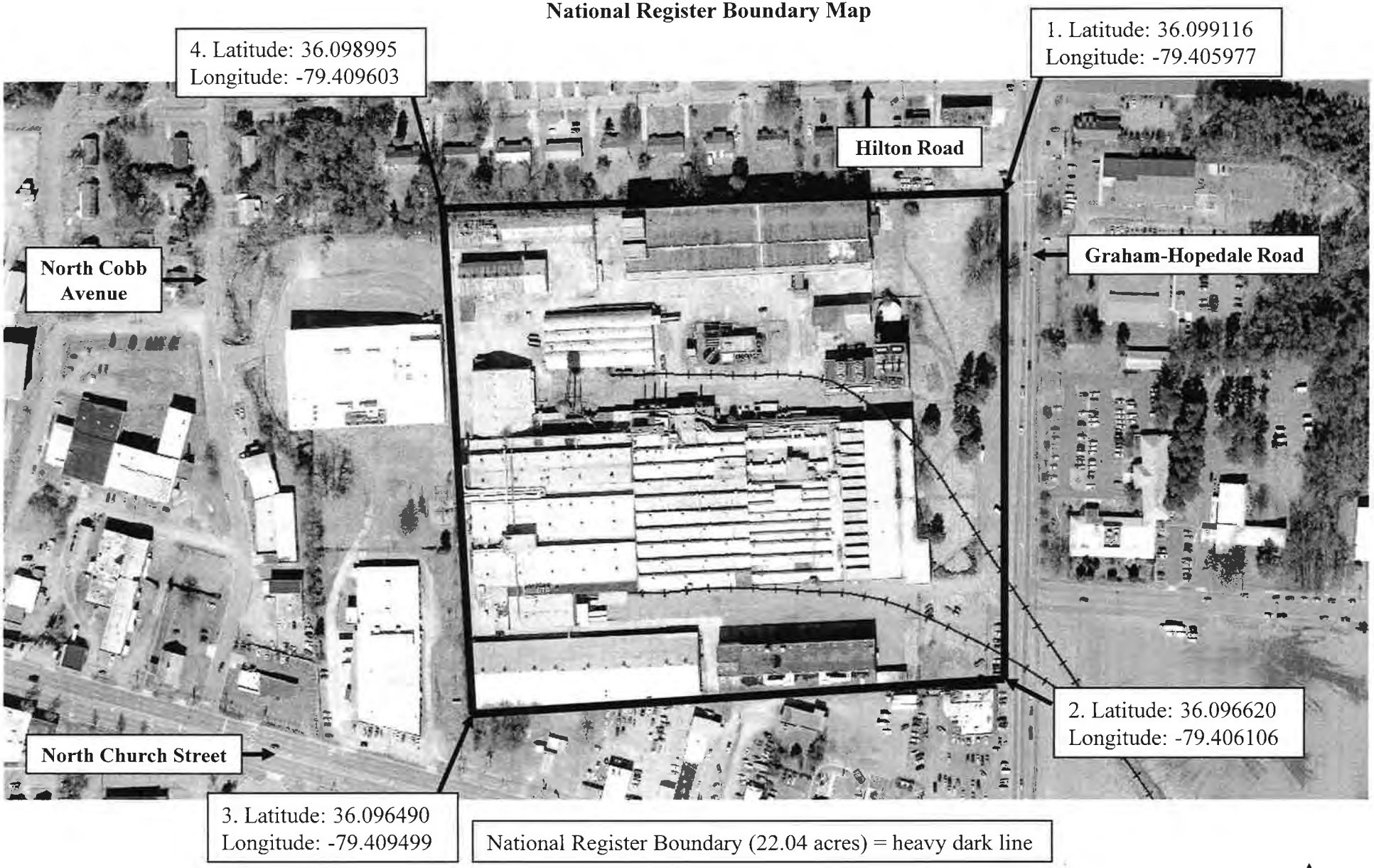
The Western Electric Company – Tarheel Army Missile Plant boundary (tax parcel #139757) encompasses 22.04 acres historically associated with the complex's industrial operation.

**Photos**

Photographs by Heather Fearnbach, 3334 Nottingham Road, Winston-Salem, NC, on July 31, 2015. Digital images located at the North Carolina SHPO.

1. Looking south from the parking lot adjacent to Graham-Hopedale Road; Buildings 13 and 14 at left and Buildings 1-4, 9-11 at right
2. Looking east from Building 4 to Building 1-A
3. Looking southwest from Building 16's high roof; noncontributing industrial waste treatment plant (Buildings 29 and 30) at center
4. Building 5, southeast oblique
5. Building 13, northeast oblique
6. Building 16, northwest oblique
7. Building 14, northeast oblique
8. Building 3, interior, north section, looking east
9. Building 4, interior, southwest section, looking north
10. Building 4, interior, central section, looking northwest
11. Building 16, first floor, east section, looking west

**Western Electric Company – Tarheel Army Missile Plant**
**204 Graham-Hopedale Road, Burlington, Alamance County, North Carolina**
**National Register Boundary Map**



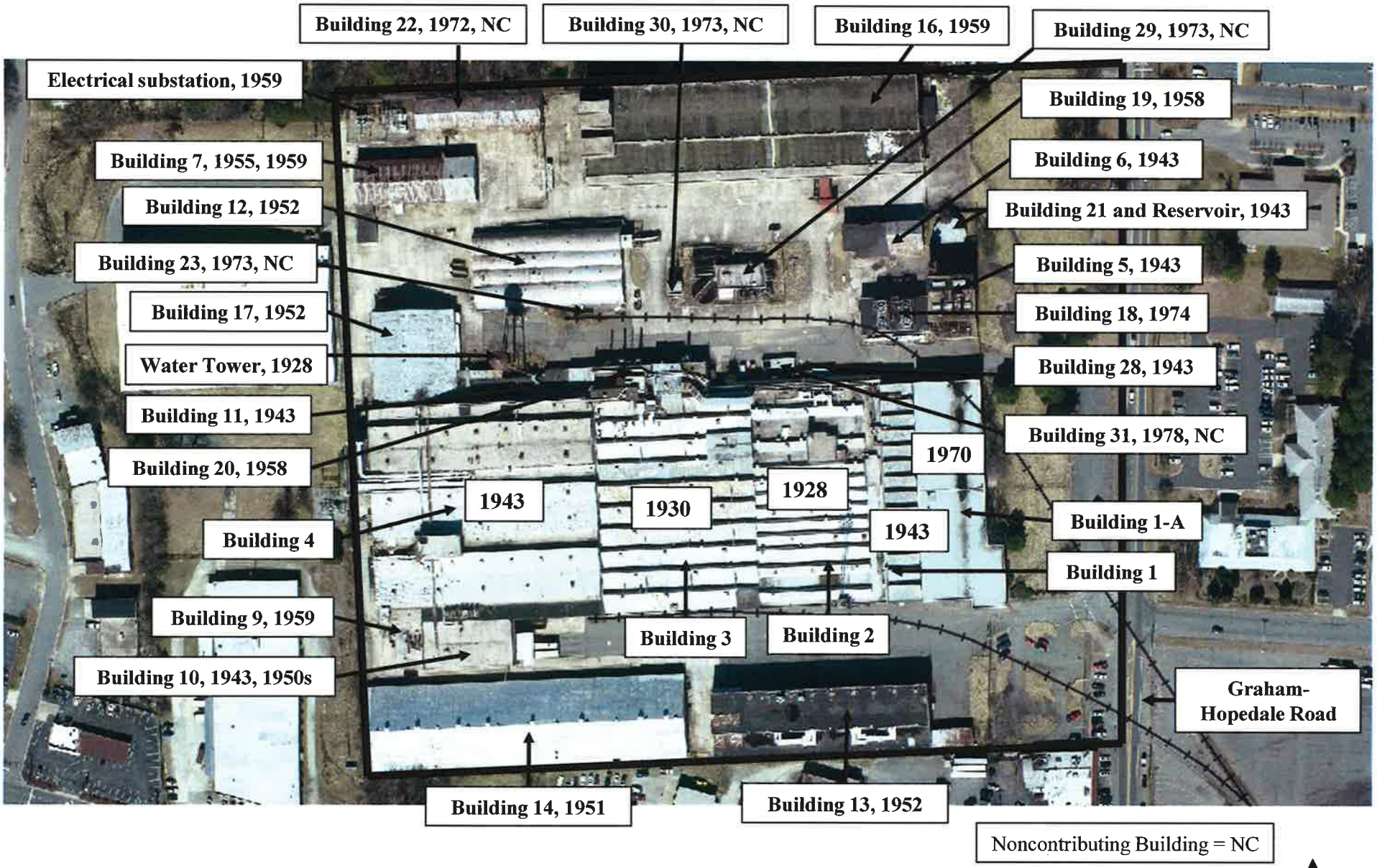

Heather Fearnbach, Fearnbach History Services, Inc. / December 2015

Base aerial photo courtesy of Alamance County GIS at http://alamancecounty.connectgis.com/Map.aspx

Scale: 1" = 200'

N

**Western Electric Company – Tarheel Army Missile Plant Site Plan**
**204 Graham-Hopedale Road, Burlington, Alamance County, North Carolina**




Noncontributing Building = NC

Heather Fearnbach, Fearnbach History Services, Inc. / December 2015

Scale: 1" = 150'

N

Base aerial photo courtesy of Alamance County GIS at http://alamancecounty.connectgis.com/Map.aspx

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