NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
HISTORIC PRESERVATION OFFICE
INDIVIDUAL STRUCTURE SURVEY FORM

HISTORIC NAME: Bell Laboratories

LOCATION: SE cr. Crawfords Corner Rd. & Robert Rd.

MUNICIPALITY: Holmdel Township

USGS QUAD: Marlboro

COMMON NAME: Lucent Technologies

BLOCK/LOT: 11/38

COUNTY: Monmouth

OWNER/ADDRESS:

DESCRIPTION

Construction Date: 1959-65; addn 1980-83

Source of Date: Ref. 1, 2

Style: Modern

Architect: Eero Saarinen & Associates

addn: Roche-Dinkaloo Assoc.

Number of Stories: 5 (plus 1 partially below-grade story)

Builder: Structural Engineers:

Foundation: Concrete piles

Elstad-Krueger Assoc.

Form/Plan Type: Rectangle with small rear wing

Exterior Wall Fabric: Aluminum-framed glass

Fenestration: Continuous glass panels 3' wide by 6' long

Roof/Chimneys: Sawtooth skylight

Additional Architectural Description:

The precise edges, hard surfaces, and unadorned rectilinearity of this massive building conform to the tenets of modern architectural design. The original structure (completed in two phases, 1962 and 1965) consists of four 5-story office-lab blocks of reinforced concrete, all under one roof, with corridors running around the outside periphery. Surrounding the entire entity is a vast curtain wall of aluminum-framed gray reflective glass. The 1980-83 addition essentially increased the length of each block. The plan of each block is arranged on interior hallways similar to a gridiron. The four long-span blocks are separated by a cross-shaped interior court, 5 stories high, ringed with galleries at every floor level, and topped with a skylit roof. The floor space of this immense atrium is broken up by large plants and trees in planters. Analysis of the design, which was considered innovative, can be found in the articles cited in the References.

PHOTO Negative File No. 4-8, 9

MAP (Indicate North)
SITING, BOUNDARY DESCRIPTION, AND RELATED STRUCTURES:
The 465 acre site lies on a plain amidst rolling tree-dotted terrain. The landscape archl. firm of Sasaki, Walker & Assoc. designed the site plan, which is formal in character and features a system of elliptical ring roads. At the main entrance and on axis with the building is a sculptural water tower constructed of steel, 127' high with a bowl-shaped tank 72' in diameter. The building is set back about one-half mile from Crawfords Corner Rd., and is approached via a long driveway and an immense expanse of lawn. Of the original four pools, the largest--six acres, six million gallons--is directly in front of the building and serves as condenser-water spray cooling.

SURROUNDING ENVIRONMENT: Urban □ Suburb □ Scattered Buildings X
Open Space X Woodland X Residential X Agricultural X Village □
Industrial □ Commercial □ Highway Commercial □ Other □

SIGNIFICANCE EVALUATION:
Bell Laboratories is Monmouth County's singular example of modern architecture designed by an internationally-known twentieth century architect. It has been said about Eero Saarinen (1910-1961) that "he designed the boldest buildings erected anywhere in the world by a generation of architects after Frank Lloyd Wright, and he put them where Wright never had the chance, center stage in the big industrial scheme of things" (Ref. 5). Observers have not only noted the forceful, arresting qualities of the mirrored-glass monolith, but have also praised the interior planning solution to Bell Labs' functional requirements. Of the spirit of the design, Saarinen stated that "its material and structure should appear as a giant pavilion on a central axis of a park-like garden, comprising the driveways and a reflecting lagoon." (Ref. 3)
The building certainly projects the authority, in our time, of corporate power and scientific technology. It seems, as one critic wrote, "beyond people, as an overall environment . . . they appear overawed by it as an architectural totality." (Ref. 2) The site is also significant for its historical role in the development of communications technology in the United States, and is associated with several nationally significant sites in Monmouth County that contributed to the development of modern-day communications technology, including Belmar Station in Wall Township (see 1352-14), where the Marconi Wireless Telegraph Company conducted experiments in transatlantic radio communications, and which later became radar research facilities for the U.S. Army Signal Corps; Fort Monmouth (see 1338-1), first established as a training ground for the Signal Corps and as a radio research laboratory; Deal Test Site (see 1337-17); and the nearby Crawford Hill installation owned by Bell Labs (1318-3A), site of significant satellite communications research, including the development of Telestar I in 1962 and Telestar II in 1963. (SEE CONTINUATION SHEET)

ORIGINAL USE: Communications Research Laboratory
PRESENT USE: Same

PHYSICAL CONDITION: Excellent X Good □ Fair □ Poor □
REGISTER ELIGIBILITY: Yes X Possible □ No □ Part of District □
THREATS TO SITE: Roads □ Development X Zoning □ Deterioration □
No Threat X Other □

COMMENTS: The property is for sale (2006), and the potential buyer states that he wants to demolish the entire structure and redevelop the site.

REFERENCES:
1. Bell Labs, Community Relations Department.

RECORDED BY: Gail L. Hunton
DATE: April 1982; updated 2006
SURVEY: Monmouth County Historic Sites Inventory
ORGANIZATION: Monmouth County Park System
SIGNIFICANCE EVALUATION (continued):

During the 1930s Bell Labs expanded its research facilities in Monmouth County, acquiring this 465-acre site in 1929. Research at Holmdel during the 1930's helped to establish reliable long distance radio telephony and founded the science of radio astronomy. A partial list of the multifaceted communications research at this mammoth new facility begun in 1959 includes engineering of the switching and transmission system for the entire telephone network; operation support systems; fiber-optics research; lasar research; early work on digital switching systems; and computers and software.

The Holmes-Hendrickson House (see 1318-27), a substantial 18th century Dutch farmhouse, was originally located on this site. In 1959 Bell Labs moved the house (minus its outbuildings) to its present location on Longstreet Road, and gave it to the Monmouth County Historical Association.

2006 Update: At the time of the original survey in 1982, Bell Laboratories was owned by AT&T, which had originally acquired the property and developed the site. Lucent Technologies is the current owner, and the property is for sale.
THE TELEPHONE COMPANY DIALS THE MOON

Behind the biggest mirror ever made by man (or part of it, see facing page), the new Bell Laboratories face inward; to see the view, the scientist must step out into the hall.

This is not the only startling aspect of the building, though it may be the one that strikes a visitor most forcibly. More surprising, perhaps, is the immense change in corporate policy implied by this piece of architecture. In the past the telephone industry has seemed determined to hide its technology behind facades of studied mediocrity. Until recently most components of the gigantic American Telephone and Telegraph Company have been wrapped in buildings made very well of brick but covered in colonial design as conservative as the telecasts with given telephone poles.

Yet it is for a division of AT&T that Eero Saarinen and Associates designed this gleaming scientific instrument and set it behind a carefully composed lake on 456 rural New Jersey acres at Holmdel, an hour's drive from Manhattan. The new Bell Lab is not only symbolic of modern science, but symbolic also of the yielding of architecture to science. It is clear at last that the good old telephone company has stepped out of its village-uncle role and accepted a frank new characterization, that of the futurist scientist.

What are other evidences of this change? Outside architecture, of course. One such indication was the appearance recently of Frederic R. Kappel, AT&T president, on the inaugural of intercontinental TV transmission via Telstar. Kappel thus identified his company not as it traditionally had been linked with home and hearth, but with the transistor, with microwave transmission, with radio astronomy, and with the other leaps forward taken in its labs.
right character seemed to be a rather formal building, dignified and restrained—yet just any ordinary office building. It should express itself as a building where important and serious developments for our time and for the future are taking place."

Formal, dignified, and restrained—the building is all these things, to the degree that it seems almost unreal.

It is true that there are human touches—the elegant canopies before the entrances and over the walks to the employees' parking. There also is a very good-looking sculptural water tower standing a mile from the building, made of steel—although it looks like concrete. There is a handsome cafeteria-restaurant downstairs with hundreds of elegant metal chairs in it (and the only incandescent lighting obvious in the building, all the rest is fluorescent). The small paradoxes at Boll, the stuff of which credible architecture is made, are very delicately handled, sometimes too delicately: for example, the concrete-clad elevator towers miss their chance for contrast in shape or finish; they sigh disinterested.

But it is not small failures that make the mood of this building so strange, so withdrawn. It seems beyond people, as an overall environment. They appear overshadowed by it as an architectural totality. When you see a person in the endlessly long corridor or in the War lobby you do not seem to see him completely. Usually he is silhouetted, moving quietly against that immense glass wall.

In this spectral design dignity was created only in the details.

Dark glare-resistant glass gives a moody portrait of the New Jersey hills surrounding the site, right, the wall of bright reflecting glass.
In many locations a wall of mirrored glass five stories high and 700 ft long would be an architectural disaster. But in the gently rolling openness of the South Jersey terrain—tree-dotted, but not densely wooded as is New England—the new Bell Telephone Laboratories Engineering Development Center, when finally glazed with reflecting glass, will have just the right amount of glitter to give it great style and elegance. Its precise, hard, shiny surfaces—and its rectilinear—will make effective contrast with the soft curves and dips and rises of the countryside. Its character—akin to the machine-perfect products its users will develop—will be peculiarly appropriate.

As is the case in producing many new products, manufacturing difficulties were encountered here in pioneering with a low-brightness reflective glass. As a result, one wall was glazed with an experimental product (see page 149) and the remainder with gray heat-resisting glass, so the building could be used. It appears a satisfactory laminated mirror glass will soon be available to replace the substitute gray glass.
The plot plan at right shows the final twin-building scheme, of which one half is now completed. The 460-acre site is approached from a highway lying to the north, or bottom, of the plan. The largest of the four pools—six acres, 6,000,000 gpd—is directly in front of the building, serves for condenser-water spray cooling and as a fire-fighting reserve. Each of the one-way, elliptical ring roads carries traffic in opposite directions, nearly sorting motorists by destination. Thanks to overhead bridges, pedestrians never need cross a road. Truck and auto traffic are separated.
Perhaps it was also the new image in mind that the telephone company* in 1957 decided to come out from behind its middle-class mask and to pick the Saarinen firm to do the new lab.

The laboratory building, like the best of technology itself, is beautifully made, precisely controlled, and of great authority.

It is called by the client an economical triumph in both first cost and upkeep. Functionally it is a superb diagram of the task assigned to its designers. In some aspects it also expresses the high-sounding poetry of technology, the occasional plume of madam amation, and its grace.

But, like much of modern science, this building, inside and out, is also a very strange phenomenon, and a terribly formidable one. Its grace is not intrinsic to its central design, but, like innumerable capons attached to its mass, is the center of a Versailles-like landscaping plan (below right), yet remains remote from it. All in all, its approach to scientific symbolism, this weird beauty may be one of the most paradoxical designs ever.

The most immediately amazing part of the building is its special glass wall. Saarinen intended this to be an actual mirror, covering all sides of a building which ultimately will be 700 feet long. 350

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* AT&T is the parent company.

Bell Laboratories, Inc. is the child, a tiny enterprise engaged in research and development. The other parent is Western Electric Co., which manufactures telephones and other equipment and builds and owns many of Bell's buildings, including this one.

Feet wide, and six stories high. To itself this idea of a totally reflective wall is not new. It merely pushes a familiar modern architectural axiom—glass from the outside is seldom transparent but almost always reflective—to the ultimate, attempting to create a building which in every detail of its gigantic existence, a building which isn't there, but is a caged reflection of the surrounding sky, landscape, and parking fields.

The architect was ahead of his time in this ambition. His glass suppliers could not make enough of the one-way reflective glass up to standard to enclose even the first half of this structure, so only the south wall wears a mirror. The other walls and even part of the south were clad in glass-reducing tinted glass instead until the suppliers can catch up. However, clear glass surrounded by glass wall—4 1/2 acres of it—framed in elegant black aluminum—today does surround all the functions of the building except for two independent Stacks of elevators.

Yet inside, not one corner of this office has an exterior window. Only the south corridor have...
This void is ringed with galleries; below, it is the world's biggest conversation pit sunk into the floor—the building's reception area. When the next two blocks of offices and labs are added alongside the first two, they will produce not only another room just as big as the reception area, but there will also be a long interior court, five stories high, topped by a skylight. Present plans label this space as a landscaped interior court, and the second lobby as an employees' lounge, including a staircase down to the cafeteria-restaurant. The renowned Pennsylvania Steel's main room in New York City is only 26 feet taller than any of these rooms.

There are thoughtful reasons for everything in the Bell Lab design. For example, the reflective glass was justified visually, from outside, by the desire to break up the massive building, playing cloud movement down its length. From inside, the justification was environmental: specifications for the glass called for it to reflect back roughly 70 per cent of the sun's energy (i.e., heat), while admitting 15 to 20 per cent of the light. In diagram, above, a constant temperature is assured outside and inside the wall of reflective glass to demonstrate how much radiant energy is admitted. Lower figures are for convected heat from glass.

The most interesting technical aspect of the building is the inside-out air conditioning.

Most buildings, particularly glass-walled ones, accept the peripheral air-conditioning zone as the big challenge and, having licked that, can condition the central spaces with relatively simple zone systems. The Bell Lab turns this idea inside out: it is the labs and offices in the core of the building which are most carefully conditioned, with individual controls. The corridors along the exteriors are cooled largely by air on the return cycle. The periphery is, for space, of secondary importance, because it is not inhabited full time.

Grundus the lab appears company officials say daily that it is cheaper, or is the end of the spread of costs compared with other labs they have built, and that the upkeep is 25 per cent less than in another comparable laboratory they operate nearby in Jersey. Moreover, the mock-up built before the design was drawn was turned into an immense money saver. R. H. McCarthy, director of plant design and construction at Western Electric, says that the mock-up, which cost about $1,800 per cent of the building budget, cost about $119,000 but eventually saved more than 3 million in actual building costs. About total building cost, Western Electric will only say that it is in the vicinity of $20 million for the first stage. McCarthy adds that Saarinen's design "represents a simple, scientific approach which, as a public utility, we like."

For Bell Laboratories...
It was with a double domino of space—one lab, one office—that Saarinen and his co-designers—chiefly Kevin Roche—began.

Soon they came up with an office-lab layout similar to their IBM scheme (Forum, June '61). The basic block, housing about 1,000, was to be six stories high, built on a structural bay 45 feet 9 inches by 108 feet. On either side of alternate rows of transverse columns were placed lines of 24-foot-deep laboratories, with six-story-deep utility spine cavities between them absorbing the columns. Then rows of 12-foot-deep offices were also placed back-to-back so that their standard storage wall partitions absorb the other transverse rows of columns.

An interior corridor separates labs from offices. Four of these six-story blocks would have filled the client's prescription for space. Two were enough for present needs. The blocks of offices and labs were rendered with the exquisite unity and precision which the design world has come to expect of the Saarinen office. The other end of the storage wall, shown opposite, is a good example.

But there was the problem of how should the blocks be related? Saarinen decided to put them all under one roof and it was with this decision that the building began to develop its immensity. For, despite his efforts to define the separate blocks within, the building it remains a single building in its impression, both inside and out. It is a building of many offices-lab spaces, and a few rooms so big they are grandiose.

The first of these enormous rooms is the immense space between the two completely six-story interior office-lab blocks. The pace...
ance, since major traffic is relegated to peripheral corridors, which permit taking full advantage of the countryside site. Emerging from concentration in lab or office, the individual will come upon a sweeping view of the countryside or the formal planting of the winter-garden interior court, and feel refreshed by his encounter with nature. The corridor walk becomes an exciting one at the points where the corridors become balconies in the reception court.

The vast, balconied reception court, which rises through five floors and is roofed by a skylight, cuts from front to back of the building to create a dramatic focus for the entire interior of the structure. In the final stage, an employee's lounge in the other building block will create its counterpart. Between them, the five-story-high winter-garden court will become the new focus of the entire complex. Its planting will be formal in character, and it will contain orange trees, growing from the giant concrete planting boxes.
Saarinen's Telephone Center Opens in New Jersey

HOLMDEL, N.J. Eero Saarinen's Development Center for Bell Laboratories has opened here, revealing a structure reminiscent in sophistication and finesse of detailing of his IBM Research Center in Yorktown Heights, N.Y. Those who have seen it have been reminded also of his great General Motors Technical Center, if only because of the juxtaposition of a long, slanting curtain-walled building with an accented water tower.

The Development Center, presumably one total entity to exterior view, is actually two separate units married in a single glass and black-anodized aluminum envelope. The two sections are identical on either side of a roof-high lobby which is ringed by balconies and connecting overpasses. The lobby is crowned by a skylight. Impressive measurements of the building are: 700 ft across front façade; 135 ft deep; and 70 ft above grade in front (a partially below grade floor extends to the rear and houses mechanical, equipment, shipping, and receiving areas). At the rear of the structure, two elevator towers serve the two main segments of the building.

A 127-ft-high water tower adds sculptural look to Bell Laboratories.