

Fort Riley  
Riley County  
Kansas

HABS No. KS-54

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81-FORIL,  
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Buildings Survey  
National Park Service  
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HISTORIC AMERICAN BUILDINGS SURVEY

FORT RILEY

HABS No. KS-54

Location: Fort Riley is bordered on the south by the Republican, Smokey Hill and Kansas Rivers. It is located north and towards the east of Junction City, and the town of Ogden lies at the eastern entrance to Fort Riley.

Present Owner: United States Department of the Army

Present Use: Army post

Significance: Fort Riley was established in the 1850's to protect settlers and traders traveling along the Sante Fe and Oregon Trails. It was laid out in a traditional cavalry post plan with limestone officer's quarters and barracks situated around a rectangular parade ground. This configuration remained for thirty years when it was decided to use the post for separate schools for cavalry and artillery troops. The post underwent a dramatic change at this time when a new plan featuring two separate but adjoining posts, was superimposed over the 1850's plan. The new plan symbolized the fundamental change that occurred at Western posts after the Civil War—the transformation from small, temporary frontier posts to large, permanent posts. A plan such as that of Fort Riley provided comfortable accommodations and amenities for the soldiers and their families, similar to those enjoyed by civilians in comparable situations. This plan also represents an early instance of multi-disciplinary planning, coordinated by a single hand. Engineering, architecture and landscape design all influenced the finished layout and three dimensional character of the post. The 1880's plan continues to dominate the appearance of Fort Riley.

PART I. HISTORICAL INFORMATION

A. The Planning of Fort Riley, 1852-1939

Although Fort Riley began its existence with a conventional plan common to Western frontier posts, it metamorphosed during the late 1880's and early 1890's into a military community in which an unusually high quality of site planning, engineering, and architecture were employed. Today it represents a successful use of the principles of comprehensive town planning that pre-dated the observance of such tenets in most civilian real estate developments.

Fort Riley's original plan dated to 1852, when Secretary of War Conrad instructed General U.S. Clarke, Commanding General of the Department of the West, to locate the site of a new post near the convergence of the Republican and Kansas Rivers. General Clarke appointed a board of officers with professional qualifications in both construction and engineering to select the site (see W.F. Pride, The History of Fort Riley, pp. 60-61). Thus, Captains, E.A. Ogden and L.C. Easton of the Quartermaster Department, Captain C.S. Lovell of the 6th Infantry Division and Lieutenant J.C. Woodruff, Topographical Engineer, set out to select a site.

In October, 1852, the board established a camp on the present site of Fort Riley, calling it Camp Center for its proximity to the geographical center of the United States (ibid). Although the precise considerations that led to the choice of this location are not known, its central location, defensible approaches, and nearness to a steady water supply and supposed navigable river all probably influenced the officers. In November, 1852 the board submitted its report to the Secretary of War, who approved it (ibid). It seems likely that the board also submitted with its report a proposed plan of the fort. Reference to an approved plan is found in official correspondence less than two years later, and the officer's professional backgrounds would have well qualified them to prepare a plan at the time of their visit (see letter from Commanding General of the Department of the West to Major E.A. Ogden, June 25, 1855). Probably Captain Charles S. Lovell and Lieutenant J.C. Woodruff, the topographical engineers of the party, selected the exact site of the post's parade, while Captains E.A. Ogden and L.C. Easton of the Quartermaster Department advised on siting and number of buildings.

In March of 1853 the Army Appropriations Act provided \$65,000 for the erection of buildings at Camp Center. In 1853 and 1854 temporary structures were erected (Pride, p. 61). Brevet Major Edmund A. Ogden of the Quartermaster Department supervised construction of both temporary and permanent structures at the new post. In March, 1855 Congress appropriated funds for erection of sufficient permanent buildings at the new post (named Fort Riley in 1853) to accommodate ten companies of dragoons (cavalry) and ten companies of infantry (see Pride, p. 65 and June 25, 1855 letter to Ogden). The fort's garrison was intended to prevent conflict between the Indians of the region and settlers or commercial shippers traveling on the Santa Fe and Oregon Trails.

Major Ogden's large force of workmen completed work in late 1855 on twelve major buildings and several auxiliary structures. The post at the end of 1855 represented a realization of the 1852-53 plan (see Supplemental Material # 1). A rectangular parade ground on high, relatively level area north of the Kansas River was bounded on the north and south sides by six double officers quarters and on the east and west sides by six barracks. Wooden stables were built to the southwest and the hospital immediately to the east. Inexplicably, the chapel and parsonage of the post were built some distance to the northwest of the parade group. A sutler's store and carpenters, saddlers and blacksmith shops were added to the west of the rectangle of quarters. Small frame quarters for non-commissioned officers were scattered all over the post as late as the 1880's (Pride, p. 92).

The 1855 configuration of Fort Riley remained for about thirty years, beyond the close of the Indian campaigns. In 1871, the school of instruction for Light Artillery was discontinued. With its original purpose accomplished, the post nearly was abandoned. For many years it was debated whether or not to dispose of the Fort Riley Reservation. In the meantime, little change was made. It was rescued by Lieutenant General Philip H. Sheridan, Commanding General of the U.S. Army and former cavalry commander, who in his 1884 annual report urged that the post become headquarters for training cavalrymen and procuring cavalry horses. The same year Major General J.M. Schofield, Commanding General of the Army's Division of the Missouri, recommended that a practical school for artillerymen be established. In 1885 General Sheridan secured authorization and funds to repair and reconstruct Fort Riley as a school for both cavalry and artillery troops (Pride, pp. 186-88).

The first step in carrying out the rehabilitation occurred also in 1885, when Brigadier General Nelson A. Miles, Commanding General of the Army's Department of the Missouri, and Major James Gillis, the Department's Quartermaster, visited Riley to decide on a plan for the post's expansion (Pride, p. 189). It is not known to what extent Miles and Gillis influenced the design of the plan eventually adopted. They may have recommended the construction of separate posts for cavalry and artillery, one of the chief features of the plan executed.

General Sheridan dispatched Captain George E. Pond to act as constructing quartermaster (see "The Cavalry Post of Ft. Riley," p. 118). Pond was charged with supervising the preparation of plans, making repairs, and superintending new construction. An experienced construction supervisor, Pond was a graduate of West Point and had won rapid recognition in the Washington headquarters of the Quartermaster Department for his efficient execution of Army projects (see "Capt. George E. Pond," Junction City Union, December 28, 1889).

Pond began his work preparing or securing plans for additional officer's quarters along the north side of the 1855 parade. In January, 1887, Congress authorized creation of the School of Application for Cavalry and Artillery at

Fort Riley and appropriated \$200,000 to complete quarters, barracks, and stables already started and to erect additional buildings (Pride, p. 194). Captain Pond promptly produced a plan for the proposed artillery post northeast of the old parade. This plan, involving a long parade on a northwest-southeast axis and a semi-circular perimeter at its head, was approved by the Secretary of War later that year (see Pond's letter to Adjutant General, U.S. Army, January 7, 1888). Next, Pond let a contract for construction of the residence of the commander of the artillery post, four double set of officer's quarters, two barracks, five stables, two gun sheds, and the artillery administration building (Pride, p. 196).

It was originally intended, according to a set of old blueprints, that barracks for seven companies be erected on both the east and west sides of the Parade Field and extended south with officer's quarters constructed in the form of a horse shoe beginning just east of the current Quarters # 24 and west of the old Cavalry Club (Pride, p. 193). This plan, however, was never enacted. In January of 1888, Colonel Forsyth, Commanding Officer, drafted a letter with the help of Quartermaster, Pond, and Surgeon, Dallas Bache to explain.

It was my understanding, upon taking command of Fort Riley, that all the plans for its reconstruction had been decided upon. I therefore accepted the situation, although I felt that if this post were remodeled under the original plan, it would be impossible, with a full regiment of cavalry, to have a dress parade, inspection or review, anywhere within its limits.... I pointed out this serious defect to Captain Pond suggesting the only possible remedy, and, under my direction, the original drawing embodying this plan...was made and submitted in person by him to the Lieutenant General, commanding the Army. To re-arrange the six sets of old barracks, referred to in the communication so as to make them harmonize with the other buildings at the post, will cost us as much as to build the new ones mentioned herein. The plans enclosed show quarters constructed, and to be constructed, for three field officer's quarters and thirty-six captains and lieutenants. I respectively urge in this connection, that quarters be built to meet the requirements of a full quota of officers for a regiment, viz.: five (5) field officer's quarters and thirty-eight (38) captains and lieutenants, and in addition thereto, a sufficient number to shelter such officers of the medical and other staff departments as will be stationed here.

A separate letter was also sent by the Quartermaster, George E. Pond, to the assistant General in January of 1888, detailing his ideas for the expansion of the post (National Archives, Washington, D.C., R6 92 Box 915). According to Pond,

The present quarters of commanding officers and the two double sets on the south side of the parade (the third burned last winter) must

necessarily be removed to permit any enlargement of the post. The six old barracks are in a very dilapidated condition, and to reconstruct and modernize them, it will be necessary to replace all the wood work, to take down a good portion of their walls and rebuild from the ground, and would cost very nearly, if not quite as much as to replace their capacity with new barracks.... The post is desired to be built to accomodate a full regiment of Cavalry, and it will be impossible to parade a regiment in any manner with the parade ground as it is and there is no other ground available within a less distance than three-fourths of a mile from the post. By removing these old barracks.... and making the long axis of the parade east and west it will be possible to parade a Cavalry regiment in a line of platoon columns or line of masses.... The contours of the whole map show ground as it now is, a good deal of grading must be done to correct these contours.

The revised plan won approval in Washington and in 1889 Congress appropriated funds to carry out the plans, bringing the total amount committed to nearly \$1.5 million (Pride, p. 200). The purpose of the 1887 and 1888 plans for Fort Riley was to create separate, but proximate cavalry and artillery posts. The two posts would be able to share in the educational mission of the post, but preserve their separate identities, growing out of the differences in cavalry and artillery training, operations, and regimental organization.

The plan adopted took advantage of the topography of the site. The cavalry post parade (see Supplemental Material # 2) expanded east and west along a relatively level grade bounded on three sides by drops in elevation. Forsyth Avenue, a new residential street, extended north of the Cavalry Parade along level ground to its terminus at the cavalry post commander's quarters now Building # 1 Barry Avenue. There are a few photographs from the Pennell Collection which show this relationship of buildings in 1895 and 1900 (see Supplemental Material # 5, # 6 and # 7). The artillery post was located to the northeast of the end of Forsyth, beyond shallow ravines and depressions. The Artillery Parade was laid out on a gently sloping plateau bounded to the southwest and northeast by slight depressions.

The design of George Pond's 1887-88 plan for Fort Riley was a combination of formal and informal landscape principles. The cavalry post (see Supplemental Material # 2) featured by bi-axial plan: the east-west parade formed one axis and Forsyth the other. An 1898-99 Pennell photograph entitled, "West Forsythe Place" shows the terminus of Sheridan and Forsythe Avenues with Building # 25 in the foreground (see Supplemental Material # 8). Another photograph produced during the same period shows the view looking west down Sheridan Avenue with family officers quarters to one side and the cavalry parade to the other (see Supplemental Material # 9). The intersection of the two axes is now marked by the "Cavalryman" statue at Forsyth and Sheridan. The vistas at the ends of the axes were terminated by important buildings, usually

monumental in size. At the head of Forsyth Avenue was the residence of the commanding officer at the cavalry post; at the south end of the north-south axis was the cavalry dispensary; and at the east end of the Cavalry Parade was the cavalry post administration building (now the Cavalry Museum). Only the west end of the parade lacked a definite terminus.

The artillery post plan (see Supplemental Material # 2) was also formal. A single main axis running from the northwest to southeast served to unite the officer's residential group at the head of the parade and the enlisted men's barracks, administration building, and gun sheds at the foot. Each of the two sections of the parade had its own formal scheme. The officer's quarters were organized in a semi-circle, with those of the field and company officers flanking symmetrically the quarters of the commander of the artillery post (now Building 100) at center. The buildings fronting the rectangle constituting the lower section of the Artillery Parade also were organized with a regard for symmetry. The artillery post administration building occupied the center of the southwest side, flanked by two barracks; it was answered on the opposite side by three barracks of the same plan. Axial terminations also occurred in the Artillery Parade: the post commander's quarters marked the northwest limit of the parade, and the five gun sheds the southeast limit. An 1895 Pennell photograph shows a "View of Fort Riley" with the backs of the quarters along Forsythe Avenue in the foreground (see Supplemental Material # 10)

The formality of the plan for both posts lent itself to the hierarchical relationships present at a military post. Commanding officer quarters occupies the most prominent locations in residential groupings, surrounded by, in order of rank, field (major or above) and company officer quarters. Officer's quarters were also located on a higher elevation than the barracks at the Artillery Parade, further denoting the difference in status. At the cavalry post, the parade separated officer's quarters from barracks.

Along the peripheries of the two posts, Pond employed informal planning precepts, in the tradition of Frederick Law Olmsted, father of the American landscape architecture profession. Both posts were sited on relatively flat surfaces between depressions and ridges on the topography (see Supplemental Material # 2), not imposed on the land in the French formal tradition. In addition, curvilinear access drives and the oblique connections between the two posts followed topographical, not axial lines, an informal planning principle. One grouping of quarters in Pond's final plan (see Supplemental Material # 2) illustrates an informal scheme. Six non-commissioned officer's quarters (now Lower Brick Row) were grouped picturesquely in a hollow to the west of the Cavalry Parade. Another Pennell photograph shows the arrangement of the original three of this grouping, built in 1889, as they appeared in 1898-99 (see Supplemental Material 11).

To carry out the ambitious program of construction required by the 1888 scheme for Fort Riley, Captain Pond hired specialists to concentrate on the specific features. To prepare plans for the buildings needed, Pond retained William

Goding, a young architect. For topographical surveys and the preparation of plans and specifications for road and street construction and the sanitary sewerage system, Pond hired W.H. Stair, a civil engineer (see "From Fort Riley"). An unnamed "steam heating expert" (possibly Stair; see Pond to Adjutant General, January 7, 1888) advised Pond on the design and siting of the steam heating plant. The landscape gardener or designer of the 1887-91 features of the plan is not known. Pond himself was thereby freed to concentrate on his administrative duties as constructing quartermaster: supervising his staff, preparing specifications and contracts, advertising for bids, letting contracts, and superintending construction.

In July, 1891, after six years of work, Captain Pond was adjudged to have completed his assignment and was transferred elsewhere. He had superintended the expenditure of \$850,000 since 1885. In the cavalry post he had built five of twelve stables planned, six barracks, 22 of 31 officer's quarters, the cavalry administration building, the guard house, dispensary, mess hall, drill hall, hospital, etc. In the artillery post, he had erected five stables, two of the five gun sheds planned, two of the five barracks, the artillery administration building, and five out of the eleven officer's quarters planned. In addition, Pond and his assistants had completed plans and specifications for completing the work not yet commenced (see "From Fort Riley").

Equally impressive were the engineering works accomplished by Pond and Stair. They had constructed a water works system for both posts, with five miles of mains and a 500,000 gallon reservoir; a central steam heating plant supplying every building and extending "over more territory than any other plant in the world," a system of sanitary sewerage, and five miles of roadways, graded and macadamized (ibid).

After Pond's departure, the Army completed his 1887-88 plan with a high degree of fidelity. In the mid-1890's, 1903, and 1909, expansions of the Cavalry and Artillery School resulted in additional buildings including quarters for officers and non-commissioned officers, barracks, stables, etc., which were constructed generally in accord with the 1888 plan (see 1903, 1908, and 1909 articles cited in bibliography and Pride, pp. 221-48, passim). Thus, they provided infill around Pond's previously established post.

Little new construction took place at the main post of Fort Riley between 1910 and 1928. The organization and training of the First Infantry Division at Fort Riley during World War I took place at a vast temporary camp, Funston, away from the permanent buildings (see Pride, pp. 263-85, passim). In 1926 the Construction Service of the Army's Quartermaster Corps received a congressional authorization to replace the temporary World War I structures throughout the United States with permanent buildings for the peace-time Army (see William E. Horton, "The Work of the Construction Service," pp. 7-9). Thus, the Army launched a \$148 million project which was to cover a ten year

period. The depression accelerated the pace and volume of construction as Washington politicians began to expand all public works efforts in 1929 to help relieve unemployment. At Fort Riley this campaign saw the erection of brick quadplexes for junior officers around the edges of the old cavalry and artillery posts. Brick duplexes in 1931 completed the grouping of non-commissioned officer quarters in Lower Brick Row, while a group of new brick field officer quarters on Pershing Avenue formed a concentric semi-circle outside the Artillery Parade quarters on Schofield Circle. A final group of quarters, for non-commissioned officers, rose in parallel rows on Stone Court, in 1939. New construction on the main post halted with the entrance of the United States into World War II (see Supplemental Material # 2).

The planning of Fort Riley's main post symbolizes the fundamental change that occurred after the Civil War at the handful of Western posts, that the Army retained--transformation from small, temporary frontier forts to large, permanent posts. A plan such as that of Fort Riley provided comfortable accommodations and amenities for the garrisoned soldiers and their families, similar to those enjoyed by civilians in comparable situations. A veritable "city" was created on a large scale and with a complex array of features.

Fort Riley also represents an early instance of multi-disciplinary planning, coordinated by a single hand. Engineering, architecture, and landscape design all influenced the finished lay out and three-dimensional character of the post. Such a comprehensive approach to community development was not to be seen in civilian projects until the creation of Roland Park, Maryland, begun by the Olmsted firm in 1891 (see Newton, Design on the Land, pp. 468-69).

The reconstruction of Fort Riley on such broad planning terms was possible because the Army was the developing agent, controlling all aspects of the operation. Sufficient funds to realize the plan were provided, features of the plan were erected at cost, and the vagaries of the civilian real estate market were absent. The Army made a long-term commitment to the expansion of the post and stood by it.

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B. Limestone Construction at Fort Riley:

Geology and Quarries

Limestone is found in abundance in the high river bluffs that border the three rivers dividing the Junction City-Fort Riley area. These steep bluffs are composed of layered horizontal limestone ledges. There are three geological rock classifications: igneous, metamorphic, and sedimentary. A limestone is sedimentary. Because it is found in layers it is also classified as "stratified." This characteristic makes the stone easy to cut and to form into blocks for construction. Also, limestone, like marble, is classified as "calcareous" which refers to the predominant mineral that forms the stone's chief constituent. Limestone's makeup means that when quarried the rock is soft and pliable, and when it is exposed to the atmosphere over a period of time it hardens and makes a good building stone. According to Robert Hay's 1896 report on the geology of the Fort Riley Reservation for the United States Geological Survey (USGS), the predominate limestone in the area is "permian," while the strata area in which it is found is the "Main ledge."

The Fort Riley Reservation includes a number of limestone quarry sites from which the stone used in the construction of buildings was taken. These sites are located along the bluffs of the Republican, Kansas and Smokey Hill Rivers which run through the reservation. Along the Kansas River are Grant Cliffs and Sheridan Bluffs. Sherman Heights along the Republican River is another site of limestone. It is also seen on both sides of the Smokey Hill River. Quarternary deposits are also found toward the head of the adjoining creek valleys such as Lyons and Clark Creeks and their tributaries, Otter, Dry and Humblot Creeks (See Hay, "General Map of Fort Riley Military Reservation and Neighborhood").

According to Hay, the limestone deposits could be divided generally into two groups, the Main ledge, a massive outcropping of limestone, and the stratas of rock above and below it.

The beds immediately above the Main ledge may be spoken of as the Quarry beds. Throughout all the region they yield good building stone, easy to work and of soft, warm tint, in layers from 6 to 18 inches thick, of jointed structure, which give masses 6 to 12 feet long and 3 to 5 feet wide. The shale partings thicken in places to shale beds several feet thick, and the stone changes to shaly flags with hydraulic properties, as at Milford. These beds may be altogether 50 feet thick, above which shales predominate, with occasional ledges of stone, of which only the highest is numbered, and which attains the thickness assigned to it in the section only west of the ninety-seventh meridian, somewhat.

One of the greatest advantages of limestone is that it was found close to the surface, often just under the topsoil, and thus could also be found exposed

along river bluffs or hill sides, and sites could extend almost uninterrupted for many miles. It is found in layers generally six to eighteen inches thick. In addition, its softness when quarried makes it easy to extract and to work.

The so-called magnesian limestones of this district--the Main ledge and the ledges above it--are all useful for building purposes. They can be sawed and otherwise easily cut by the mason, and they harden on their exposed surfaces. The layers above the Main ledge, giving range stone from six to twenty-four inches in thickness, are mostly used, the Main ledge itself being used only where blocks of large cubical dimensions are wanted. The new buildings at Fort Riley show the character of these stones, as do also numerous private dwellings in Junction City and the surrounding region. The mid-shale bed is also of fine quality in many parts of the district. At Fort Riley it is three feet thick; is known as the "white ledge," and is used for caps and sills. On Clarks Creek, at the mouth of Dry Creek, it is still thicker, and of fine quality. East of the district it is also of value, and beds lower than the numbered section are extensively quarried. The building stone of this district must, as population increases be largely exported to the western part of the state as well as to the east.

#### Contractors and Workers

The initial settlers in the Fort Riley area soon saw that the lack of timber in the region required stone construction. One source later commented that timber "in consequence of the superior character and cheapness of our stone, lime and sand, the buildings in Riley County average well in quality...(Riley County Kansas, The Blue Ribbon County, 1881, p. 25). Major E.A. Ogden, the posts first quartermaster, realized that the situation required special workers who were familiar with stone construction. In 1855 he wrote a letter to the Quartermaster General in Washington, D.C. and noted that he had hired one hundred masons and sixteen stone cutters, along with thirty carpenters and teamsters, and four blacksmiths. The use of stone workers was fairly expensive as they received around \$2.00 to \$2.50 per day, apposed to the carpenters, painters, plasters, blacksmiths, who received about \$ .50 to \$1.00 less per day. This expense may have contributed to Fort Riley's early troubles when building ceased before it was completed after the appropriation from Washington ran out.

Stone masons often were recent immigrants from Ireland and Germany, where stone buildings were constructed much more extensively than in America. In 1853, the building of Fort Riley attracted Irish and German immigrants west ward. They came from Cincinnati and St. Louis and worked as stone masons and carpenters and after the post was completed, they "pre-empted" land along the Kansas River and its tributaries and concentrated in communities like Rock

Creek, Elbow, McDowell's Creek, Clark's Creek, Ogden, Junction City, and Chapman's Creek (Thomas, "The Rev. Louis Dumortier," p. 258). Under the supervision of Joseph O. Sawyer, these workers built smooth-faced limestone buildings. Sawyer was employed as "architect and supervisor" according to P.G. Lowe ("Recollections of Fort Riley," p. 101). They arrived at the post in March of 1855 after the army had left on summer campaigns. They slept in the barracks or in tents. The men immediately started working and by the end of July they had constructed a two-story stone building. (Lowe, p. 101). Their contracts stipulated that they were to work until Nov. 15, 1855, and a portion of their wages was retained each month, with the balance coming to them after the project was completed (Lowe, p. 101). The necessary woodwork, doors and frames, window sashes etc. came from a factory in Cincinnati and shipped with all the lumber, hardware and glass by boat to Fort Leavenworth, and from there, by wagon, to Fort Riley. The Cincinnati contractors were named Sawyer and McIlvain or McIlwain (Lowe, p. 101).

While the founding of Fort Riley and its initial construction of buildings occurred in the 1850's, the next boom phase of construction occurred during the 1880's. In 1889 many limestone officer's quarters were erected. Local companies from Junction City secured contracts and hired local residents to do masonry and carpentry work. Capt. George E. Pond, the constructing Quartermaster at Fort Riley from 1885-1891, advertised for bids in the Junction City Union. Contractors were required "to furnish all materials and labor" (Specifications by George E. Pond for Building # 73 (RG 92, Box 918, National Archives, Washington, D.C.). Junction City companies such as Zeilger and Dalton Brothers and John Oberg, John Holmgreen, H.W. Pratt, and C.E. Bently were all awarded contracts for construction on the post (See Junction City Union, September 3, 1887, p. 3).

The use of local companies and workers continued through the next major period of construction on the fort which occurred during the late-1920's and 1930's. The depression encouraged the expansion of public works projects to help relieve the unemployment rolls. Building companies in the local area included Mont J. Green of Manhattan who was awarded the contract for buildings around Stone Court in 1938.

#### Stonecutting and Construction

The first step in quarrying the stone was to find and uncover a deposit of limestone of the proper thickness in an easily accessible location. Since limestone was found so close to the surface it was generally considered impractical to uncover rock more than approximately three feet down. Any deeper required the laborious removal of ground. The soil above the limestone was removed with a horse drawn scraper, known as a slip. After removing and hauling off the top soil, blocks were measured off and the cutting process begun.

The early settlers generally used a sledge to break blocks of stone for building from the rock ledges and bluffs. Later, the feather and wedge or feather and plug method was used. A row of holes was drilled into the stone along which the rock was to be split. In each hole was inserted two feathers, short metal rods curved at the upper end. Then, a metal wedge or plug was lightly driven with a hammer until the stone split. Once adopted, the feather and wedge method was used almost exclusively in this area to quarry both post rock and building stone, until later machine cutting tools were developed.

After the rough blocks were cut, the stone cutter examines them in order to decide how its shape and size could be used to the best advantage, i.e. header, stretcher, lintel, corner stone, etc. Each side of the block was finished or dressed individually. The dressing of stones was discussed in the Encyclopedia of Architecture, Carpentry and Building, p. 72, as follows.

The stone is placed with the bottom bed up, all the rough projections are removed with a hammer and pitching tool, and approximately straight lines are pitched off around its edges; then a chisel draft is cut on all the edges. These drafts are brought to the same plane as nearly as practicable by the use of two straight edges having parallel sides and equal widths, and the enclosed rough portion is then dressed down with the pitching tool or point to the plane of drafts. The entire bed is then pointed down to a surface true to the straight edge when applied in any direction--crosswise, lengthwise and diagonally. Lines are then marked on this dressed surface, enclosing as large a rectangle as the stone will permit being worked to, or of such dimensions as may be directed by the plan. The faces and sides are pitched off to these lines. A chisel draft is then cut along all four edges of the face, and the face either dressed as required, or left rock-faced. The sides are then pointed down to true surfaces at right angles to the bed. The stone is turned over bottom bed down, and the top bed dressed in the same manner as the bottom.

There are a number of ways to finish the faces of cut stone. It can be pointed, rough or fine, with a pick or point which leave narrow tool marks. The surface may also be hammered for an even smoother surface, or the stone can be left rough or rock-faced.

There are general rules for laying all types of stone masonry be it ashlar, square cut, random or rubble. Masonry must be first of all laid in a series of courses, perpendicular to the direction of the pressure which it has to bear in order to give it strength. This process is referred to as laying stone on its natural bed. The largest stones are used for the foundation. The dust must be removed and the stone moistened with water so that the mortar will not dry too fast and become powdery. Then, all joints and spaces are filled with mortar and a thin layer spread on the top surface. The next course is added to overlap the course below so that no course is directly

above the joint of the course beneath it. This method, or bonding, means that each stone is supported by at least two stones together. In addition, the entire structure should be carried up simultaneously. If one side becomes too much higher than another the larger side will settle before the other side is attached, causing cracks in the structure.

#### Construction of Stone Buildings at Fort Riley

The early stone structures at Fort Riley, of which only four remain (Buildings # 3, # 24, # 30 & # 123), were constructed of hammered, ashlar block limestone, built of a simple, unornamented, vernacular architectural style. Each stone had to be hand cut and dressed using the simple cutting tools, hammers, chisels, etc., of the day. Dressing stone with a hammered finish is a three step process. First the blocks are rough pointed. A pick of heavy points is used to remove the rough surface of the stone, leaving short, narrow tool marks. Then, the blocks are tooth axed. The tooth axe has a number of points which when applied to the surface of the stone gives it a finer pointed surface in preparation for hammering. Finally, the blocks are "bush hammered." The bush hammer is a square prism of steel with pyramidal points. With it, any remaining roughness is hammered out. The walls of these early stone buildings are thick, approximately sixteen inches. Wall thickness in stone buildings is generally proportional to the height and length of the building and, of course, with the great abundance of limestone there was no need to economize on stone in the early days.

By the next phase of construction at Fort Riley, beginning in the 1880's, hammered, hand cut limestone was no longer being used. Though limestone was still cheap and plentiful, labor was not. In addition, machine cutting tools had been devised to ease production. Thus, in the buildings constructed after the 1850's, rock-faced ashlar limestone was used to build the architect designed, Queen Anne influenced residences. Rock-faced stones are those whose faces are left untouched as they come from the quarry. Leaving one side of the block in such a manner reduced cost. Not only was rock-faced stone cheaper to produce, by the 1880's its heavy, unfinished, rustic form had become fashionable with the introduction of H.H. Richardson's Romanesque Revival style architecture. The rock-faced treatment gave the building form and texture which combined nicely with the lintels, sills and other decorative elements which were then of smooth-faced stone (or visa versa). This was the case at Fort Riley. The stone residences built here after the 1850's have rock-faced walls and most have contrasting smooth-faced lintels and sills. The walls are approximately eighteen inches thick which would be necessary to accommodate the increase size of the load bearing masonry residential structures built during this period.

By the beginning of the twentieth century, limestone quarters at Fort Riley had begun to evolve. While the machine-cut, rock-faced ashlar limestone walls mirrored those of the 1880's and 1890's, the wall thickness had shrunk to six inches in the case of Quarters # 174, and the rock-faced ashlar limestone walls had a narrower course every other row.

Limestone buildings were constructed at Fort Riley as late as 1939. That year the army built ten rock-faced limestone quarters on Stone Court and six on Riley Place. In general, however, construction with limestone decreased. During the depression the army launched large scale construction projects to replace temporary quarters built during World War I. This project suffered from financial limitations during the early and mid-1930's so that often times brick was used instead of limestone. For example, Buildings # 330 through # 336 on Pershing Avenue, were originally intended to be built of limestone, but the cost was found to be too great, so brick was used instead. One source noted in 1933 that, "Stone construction in this country has been largely abandoned during recent years" which, "makes it difficult to find sufficient numbers of skilled stonemasons to accomplish the construction of stone buildings within a short time" (Junction City Union, Nov. 27, 1933, p. 1).

When stone was used, however, it was used as a veneer rather than as the structure's main support. Building # 373, built in 1939, has machine-cut, eight inch thick walls, as opposed to the sixteen inch thick walls of the late nineteenth and early twentieth century buildings. The coursing had also changed in 1939 as Building # 373 had random ashlar limestone walls. However, the use of limestone as late as 1939 at Fort Riley was a special case of the army wishing to conform to the overall beauty and building tradition of the fort. Had it not been that so many limestone buildings were constructed during the 1850's and 1880's, the use of limestone would probably have ended much sooner than 1939 due to the cost of stone and the lack of stone masons sufficient for large projects.

Prepared by:  
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Project Historians  
Fort Riley Family Quarters  
Documentation Project, NPS  
Summer, 1985

PART II. SOURCES OF INFORMATION

A. Primary and Unpublished Sources:

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"Some More Buildings for Fort Riley," Junction City Union, May 22, 1903.

Thomas, Sister M. Evangeline, "The Rev. Louis Dumortier, S.J. Itinerant Missionary to Central Kansas, 1859-1867," Kansas Historical Quarterly, 20:3, August 1952, pp. 252-270.

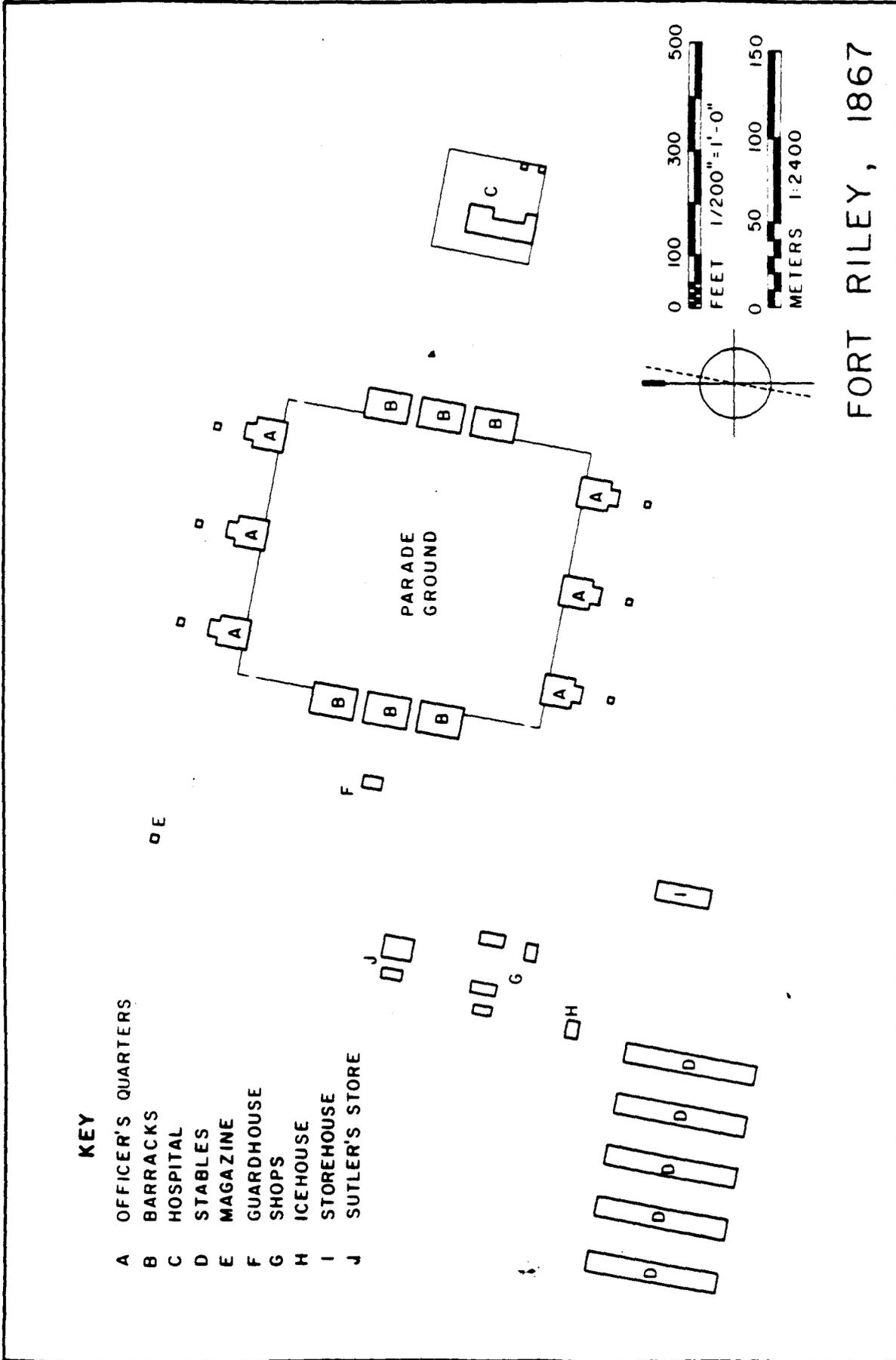
"200,000 for Fort Riley," Junction City Union, June 18, 1890.

PART III. PROJECT INFORMATION

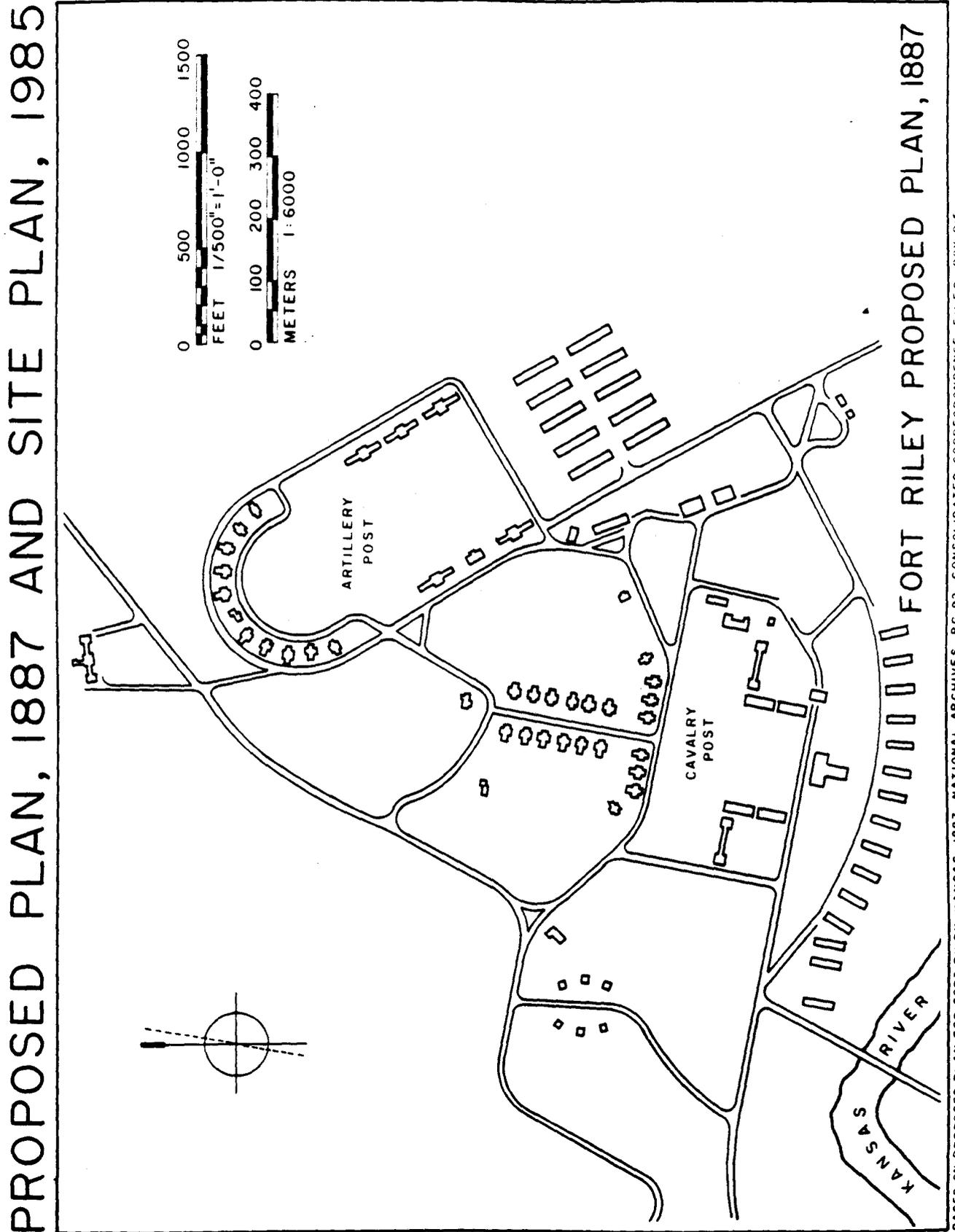
This project was undertaken by the Historic American Buildings Survey (HABS) of the National Park Service in agreement with the post commander of Fort Riley, Kansas, and the headquarters of the United States Army Corps of Engineers, Washington, D.C. The project was completed under the general supervision of Robert J. Kapsch, Chief of the HABS/HAER Division. Sally Kress Tompkins served as the Program Coordinator and Robie S. Lange as Project Leader. The Field Supervisor was James A. Glass (historian, Cornell University). The project historians were Catherine Crawford (University of Maryland) and Joseph Rodriguez (University of California). Large format photography was conducted by Mike Whye. Documentation was prepared for transmittal to the Library of Congress by Catherine Crawford.

The following more detailed HABS reports were conducted as a study of historic family officer's quarters at Fort Riley, Kansas. There are numerous historically and architecturally significant buildings at Fort Riley not included in the study. Due to the volume of existing buildings of this nature, an effort was made to select a sampling of family officers quarters which would be representative of the entire complex of quarters.

D. Supplemental Material  
1. Fort Riley, Early Plan, 1867

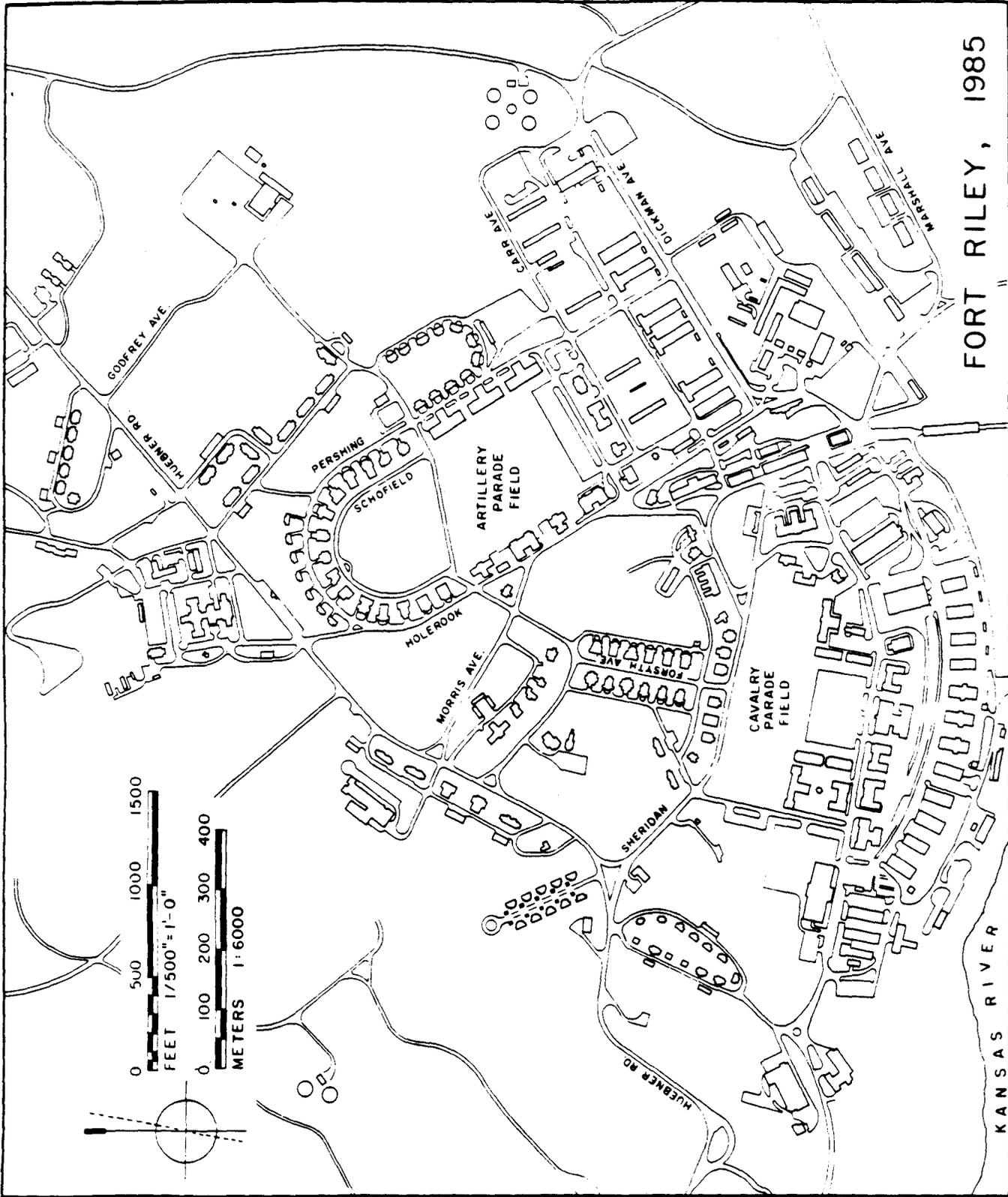


2. Fort Riley, Proposed Plan, 1887



BASED ON PROPOSED PLAN FOR FORT RILEY, KANSAS, 1887. NATIONAL ARCHIVES, RG 92, CONSOLIDATED CORRESPONDENCE FILES, BOX 915

3. Fort Riley, 1985

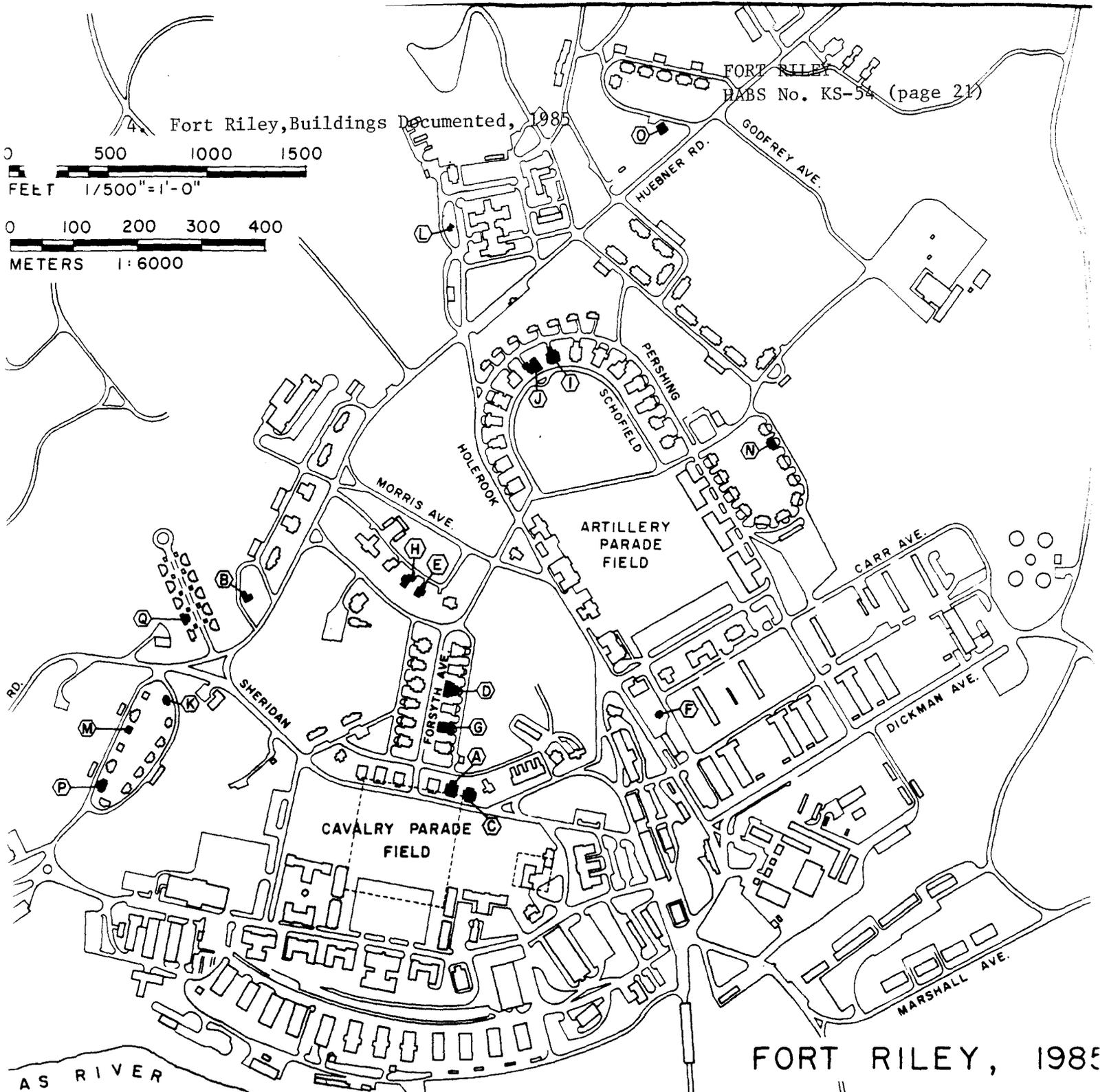


4. Fort Riley, Buildings Documented, 1985

FORT RILEY  
HABS No. KS-54 (page 21)

0 500 1000 1500  
FEET 1/500" = 1'-0"

0 100 200 300 400  
METERS 1:6000



BY GENERAL SITE MAP PREPARED BY HIGGINBOTHAM AND ASSOCIATES, ARCHITECTS AND PLANNERS AND THE U.S. ARMY CORPS OF ENGINEERS, 1977

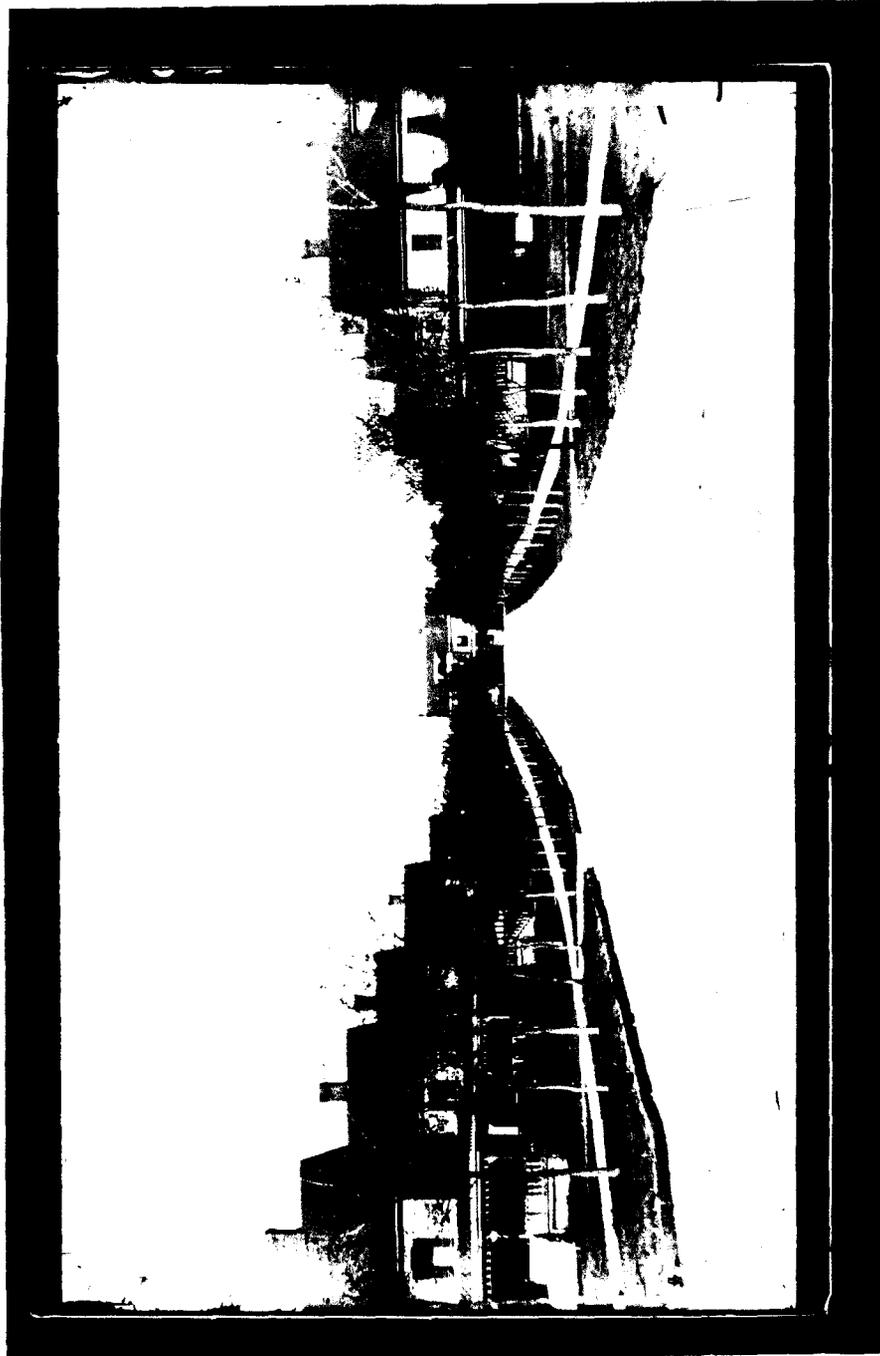
**LEGEND:**

- BUILDINGS DOCUMENTED BY H.A.B.S. LABELED (A) TO (Q)**  
 (FOR WRITTEN AND PHOTOGRAPHIC DOCUMENTATION SEE KS-54-A TO KS-54-Q)
- LOCATION OF FORT RILEY PARADE GROUND, 1867**

5. Pennell Photograph "East  
Side Forsythe Avenue,"  
1898-99



6. Pennell Photograph, Forsyth Avenue  
from Sheridan Avenue with the Commander  
of the Cavalry's House, #1 Barry Avenue  
at the top



7. Pennell Photograph, Forsythe Avenue  
from Sheridan Avenue, with the Com-  
mander of the Cavalry's House, #1  
Barry Avenue at the top, 1900?



8. Pennell Photograph, Sheridan and Forsythe Avenues with # 22 Sheridan Avenue in the foreground



9. Pennell Photograph, Sheridan  
Avenue West, 1898-99



10. Pennell Photograph, View of  
Fort Riley with the back of  
the buildings along Forsythe  
Avenue in the foreground,  
1895



11. Pennell Photograph, Non-commissioned Staff Quarters, 1898-99

