Design and plans for a historical memorial to be erected in Deadwood , South Dakota
by Aldo L Trucano

A THESIS Submitted to the Graduate Committee in partial fulfillment of the requirements for the degree of Master of Applied Art
Montana State University

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This memorial is dedicated to the early pioneer. Ihe three-dimensional figures are Calamity Jane Wild Bill Hickok, and Potato Creek Johnny. Those early-day personalities, espe-cially Calamity Jane and Wild Bill, are known nationally for their escapades. They lived and died in the Black Bills and are burled in Mt. Moriah Cemetery in Deadwood, South Dakota, Potato Creek Johnny was of a little later period, but is remem-bered by the thousands who were privileged to meet him and listen to his tales of prospecting and gold-panning days.

The relief is a composite of the original builders of the country who migrated into the area in search of gold. It also depicts their means of transportation, their joys and their tribulations. The Indian represents the Sioux Nation9 through whose territory those early pioneers had to travel in order to reach their destination.

The design and plans for the monument described herein have been executed to harmonize with the sloping terrain upon which it is to be built. Its position will also take into consider-ation the sunlight, for such a project is dependent upon proper light and shadow effects. The materials which will go into the monument will have an affinity for the surrounding cliffs and pine-clad mountain.

DESIGN AND PLANS FOR A HISTORICAL MEMORIAL TO BE ERECTED IN DEADWOOD, SOUTH DAKOTA

by

ALDO L. TRUCANO

A THESIS

Submitted to the Graduate Committee

in

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at

Montana State College

Approved:

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In Charge of Major Work

Cyril H. Conrad
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J. A. Nelson
Chairman, Graduate Committee

Bozeman, Montana
June, 1949

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Introduction

The historic city of Deadwood is today a flourishing community still with the flavor of the Old West. It lies in the same canyon that was once hustling with wagon trains, prospectors, and gamblers.

So it is with this in mind that the Chamber of Commerce has for the past few years been planning a monument or memorial designed to commemorate that past. Since the famous characters, Wild Bill Hickok and Calamity Jane had such an eventful life in Deadwood, and are buried in the Mt. Moriah Cemetery, they were chosen to depict part of that past. Potato Creek Johnny, though of a little later period, was a typical prospector, and thousands of tourists remember his tales of panning gold along Potato Creek in the Nigger Hill district.

Originally a bronze bas relief was designed to be set into a concrete wall. This project was not a satisfactory one because the bronze and concrete combination didn't seem appropriate for the location in which the monument was to be built.

The plans herein are for a concrete and cast stone memorial which will have a definite affinity for the locale in which the structure is to be built.

I wish to thank the faculty and members of the Art Department of Montana State for their help, especially Mr. Conrad who has given much constructive criticism on the memorial during its evolution from sketch form to the finished scale model.

Acknowledgments are also due to the members of the Chamber of Commerce of Deadwood, South Dakota, for their aid and assistance on the project.

Chapter I

Historical Background

Before going into the proposed memorial, its location, design, and construction, it seems fitting to give a brief resumé of the history of the country and of the characters to whom the memorial is to be dedicated.

Man in his quest for gold has for countless ages made trips into remote and unexplored regions in search of the elusive yellow metal. So it was with the Black Hills.

History is rather indefinite concerning the first white men who, in their never-ending search for wealth, wandered into the mountains in western South Dakota, then part of the Dakota Territory. It is certain that long before the arrival of the first organized expeditions, fur traders and trappers knew of the existence of the mountains and suspected their wealth. It was their tales augmented by stories filtering through from Indians that indirectly led to the formation of the Custer Expedition.

The first gold was found by the Ezra Kind party about 1833. The members of this party were all killed by Indians but left behind them a record scratched on a stone which was found a few years ago near Spearfish by a man named Thoen. The Thoen Stone, as it is now called, is in the Adams Museum in Deadwood.

The Black Hills' recorded history began in 1874 when General George A. Custer and the Seventh Cavalry made a recon-

naisance trip into the Hills from Fort Abraham Lincoln, North Dakota, to explore and map the country.

It wasn't until late 1875 that the Frank Bryant party made rich strikes in Deadwood Gulch. This caused the rush which built up a wild and boisterous gold camp.

With the influx of prospectors came gamblers, prostitutes and professional men. As the camp grew it became a tougher place in which to live, and it was during this time that Wild Bill Hickok (James Butler Hickok) was born in Homer (now Troy Grove), La Salle County, Illinois, in 1837, and grew to manhood in that vicinity. He left Homer and went to Missouri and then moved on to Kansas where he filed claim on a homestead, later relinquishing his right and moving to Nebraska where he again homesteaded. It was on this homestead that he built a corral that was so constructed that he had the entrance through the house only. It was here that he had his famous fight with Dave McCanles.

Wild Bill entered the Army as a Union Scout under General Curtis. After this he was hired by the town of Abilene, Kansas, at $1000 a month to clean up the place of its roughnecks. He later went to Fort Hays and while there, married a famous equestrienne, after which he left her in Cheyenne and came to the Black Hills with Charles (Colorado) Utter and others.

Wild Bill's appearance as described by Connelly was: "His eyes were blue but could freeze to a cruel steel grey at the

threat of evil or danger. The man who incurred his displeasure, glimpsing them briefly from under half shut lids, saw them as cold, greenish . . . Wild Bill's hair was golden brown, matching the color of his drooping mustache. This long hair gave him something of a girlish look but this was not contradictory. In reality long hair was a badge of manhood and courage, worn as a challenge to any Indian who thought himself a brave - a challenge to come and take it. It was a temptation and a defiance flaunted carelessly and constantly in the face of vicious and treacherous enemies."

Wild Bill was over six feet tall without shoes, and the boots he wore had heels two inches high. He sometimes wore a broad sash of embroidered scarlet silk. His favorite hat was a dark felt with a broad brim.

During the summer of 1876 the citizens of Deadwood decided they should have some form of government to overrule the rough class, and it was rumored that Wild Bill was to be appointed chief of police. The rougher faction warned him to get out of town but Wild Bill was not to be bullied by anyone. So during the afternoon of August 2, as he was playing poker with a group of friends in saloon Number 10, Jack McCall sneaked in the front door and shot Wild Bill in the back of the head. McCall was tried for murder by a miners' court and acquitted but was later picked up by federal authorities, convicted, and hanged at Yankton, South Dakota.

Wild Bill's grave is in Mt. Moriah Cemetery overlooking the town where he met his end. The original marker at his grave was on an ordinary board and was placed there by his friend, Colorado Charley.

It read:

"Wild Bill, J. B. Hickok, killed by the assassin, Jack McCall, Deadwood, Black Hills, August 2, 1876. Pard we will meet again in the happy hunting ground to part no more. Goodbye. Colorado Charley, C. H. Utter."

Also during this venturesome time came Calamity Jane. Her real name was Martha Jane Canary. She was born in Princeton, Missouri, May 1, 1852. It is said that her father was a Baptist minister and that Jane was well cared for in her childhood days. At the age of sixteen she ran away from school and married an army officer. Soon afterwards Jane "skipped out" to Fort Steele and became a friend of the soldiers and teamsters. She became quite an expert in handling teams and when an expedition was sent north, she donned men's attire and with the aid of her fellow packers, obtained a position with the government pack train. In this work she prospered for several months. When the expedition reached Hat Creek station the train master discovered her sex and as the result discharged her.

Calamity Jane's first introduction to the Black Hills was in 1875. She came in as a soldier in the military expedition under General Crook, who in August, 1875, ordered the miners to

leave the Hills until treaties could be made with the Indians.

Her next trip into the Hills was in 1876 with a party in which Wild Bill Hickok and Charles Utter were members.

In 1878 a terrible epidemic of small pox broke out among the miners and people of Deadwood. Most of the people were afraid to go near the stricken. Women were few to nurse the sick. In the hour of terror and death there came to the front a willing volunteer, the mule-skinning, bull-whacking and rough roving woman, Calamity Jane. Day and night she went among the sick and dying and for weeks nursed them and tended to their wants.

Percy Russell remembers Calamity Jane as "a medium-sized woman with dark brown hair and eyes. In her youth she was of splendid form, clear complexion and uncommonly good looking. In her older age the rough life of the plains and trails coarsened her appearance. She was a strong mixture of the wild, untamed character of the plains and mountain trails and generous, kindly-hearted womanhood. But under the rough exterior there beat a heart so big and friendly as to be without measure. Brave, energetic, kind, always on the line of action, with a helping hand ever turned to the poor and unfortunate, the personality of Calamity Jane became indelibly stamped upon the minds of the pioneers."

Before her death, Calamity Jane requested to be buried by the side of Wild Bill. This request was carried out by the

pioneers of the Black Hills. She died in Terry, a few miles southwest of Deadwood, August 2, 1903.

Johnny Perritt was better known as Potato Creek Johnny and is of a little later period than that of Wild Bill and Calamity. Potato Creek Johnny came to the Black Hills from Wales in 1883, and worked in a barbershop for a short time. He soon gave up barbering and went to work in the mines and mills in the vicinity of Deadwood, but this seemed to him as a rather drab way of living so he decided to do some placer mining. He went into the Nigger Hill district and started panning gold on Potato Creek. It was here that he found the largest nugget ever to be discovered in the Black Hills. The nugget weighed seven and three-fourths ounces, and a replica of it may be seen in the Adams Museum in Deadwood. He washed gold as long as he was able and then spent the last remaining years of his life in Deadwood. While there he delighted the tourists with his tales of the placer mining days, and also during this time made a few trips to Minneapolis and Chicago to show the folks at travel shows how to pan gold.

Potato Creek Johnny was of slight build, being under five feet tall. He wore his hair long, and his round face was covered with a beard and mustache. His eyes were blue and always twinkled when he spoke of his gold panning days.

Potato Creek Johnny died in 1943 and is buried beside Calamity Jane and Wild Bill.

Chapter II

Sculpture

Sculpture is the earliest art we know. Primitive man sculptured his hammers and knives from stone and designed them for a definite purpose. The tools were made to fit the hands and designed to cope with the situation for which the tool was made.

Man has progressed since that time, but we still use the same medium, stone, for some of our sculptured pieces. We can learn much from the primitive man about his art in working with stone; they knew the material with which they were working and took advantage of forms natural to the material. So it must be with the sculptor today. He should know the materials with which he is working, though today we have many mediums other than stone in which to express ourselves. Each of these materials has characteristics of its own and what is important is that the effects of one set of tools on one kind of material should not be imitated in another material by another set of tools. The aim of the sculptor should be to represent his conceptions in the forms natural to the material in which he is working.

Sculpture being a three-dimensional art is the art most nearly related to architecture. Sculpture is more solid whereas architecture is hollow. The Greeks and Egyptians tended toward these sculptural aspects in their buildings. Sculpture is never

in any true sense architectural, but the two are often combined. Architecture must have a base from which it is inevitably bound. Sculpture, on the other hand, may be free. It is interesting to note a few variations of sculptured pieces such as the earliest known piece of sculpture, the prehistoric ivory statuette from the Grotte de Lespugue. This piece has no base and is valid from any angle or any point of view. Barlach's war memorial at Güstrow is free to hover in the air, and Brancusi's "Le Commencement du Monde" rests on a point. Some animated forms of sculpture have been perfected by the American sculptor, Alexander Calder. These mobile pieces are either suspended or rest on a pivotal point. Through these examples one can readily see that the sculptor has quite a varied means through which to express himself.

The designer of this monument feels that since this project would be a commission sponsored by the Chamber of Commerce that the memorial will, of course, have to be done to meet their approval. This does not mean that the style or the technique used in the sculpturing will necessarily be stalmated, but it does mean that the sculptured statues of the three figures will have to be represented in a manner true to the characteristics of each individual being depicted. These limitations are of course not a hinderance because most any project of this type would have certain qualifications that would have to be complied with.

The material used will influence the manner in which the sculptured figures are to be executed. Cast stone is a hard material, having qualities similar to some of the natural stones that are used for sculpturing; therefore the sculptural aspects of the cast stone will be treated more or less in the same manner as sculpturing in granite or sandstone. The heavy stony quality of the cast stone will be kept throughout the sculptured piece. The statues will be simplified letting the volumes, masses and planes complete the form of the sculptured piece. This definite embodiment in the cast stone sculptured pieces will be enduring and practical because there will be no thin sections to weaken any portion of the statue.

The statues are placed at slightly different levels so that one figure will not obstruct the view of the figure behind it. This arrangement of the three-dimensional figures also creates an interesting triangular shape which keeps the spectator's vision within the area of the figures and bas relief.

The sculptured figures and the background were always thought of as a unit and any changes in the grouping of the figures also necessitated a change in the superstructure or background. The photographs on pages 25 and 26 show the monument in sections, the figures and sections of the molds.

Chapter III

Concrete and Cast Stone

Concrete may be considered an artificial conglomerate stone made by uniting cement and water into a paste and mixing into this paste a fine material such as sand and a coarser material such as broken stone, gravel, slag, or cinders. Upon the hardening of the paste the entire mass becomes like a solid stone. Mass concrete was employed by the Egyptians and Romans, but the use of steel reinforcements did not begin until the nineteenth century of our era.

Because of its composition concrete has great compressive strength but little ability to withstand tension. Steel bars, rods, or mesh fabric consequently are incorporated into those parts of the concrete members where it is required that tensile stresses be resisted. Concrete may, therefore, be divided into two classes: mass concrete, where the weight or bulk is required and where to a large degree only compressive stresses are present, and reinforced concrete, where it is necessary to introduce steel into the body of the material to counteract the tensile stresses caused by the nature of the existing loads.

The proposed monument will more or less be considered as mass concrete due to the fact that there is no external pressure, but it will be also reinforced to compensate for shifting which may occur. This shifting is doubtful since the formation of rock upon which the monument is to be placed is close to the

surface making a good bond for the footings of the structure.

Water-cement ratio: Too much water in concrete renders the paste (cement and water) thin and watery and reduces the holding strength. Many tests have shown that the strength of workable concrete remains the same for a given water-cement ratio irrespective of the amounts of the aggregates.

A small amount of aggregate will produce a fluid consistency, more aggregates will cause a plastic condition, and still additional aggregate will render the concrete dry and stiff; but the strength will always remain the same.

The characteristic element of cast stone is the aggregate composition. Consequently the aggregate must be exposed upon the face side of the piece. The cement, aggregates and water are mixed as for any concrete and then cast in molds. The molds may be of sand, wood, metal, gelatin, or plaster, as the requirements of the piece indicate.

The best cast stone is of the same composition throughout the piece. Much stone is cast in molds of metal or other materials; only the face is composed of the selected aggregates and the backing is of cheaper material. By this method the quantity of special aggregate is relatively small, and distinctive results may be obtained without great increase in cost. The latter method will be disregarded since the sculptured pieces of the monument will be of the same composition throughout.

After the cast stone has set sufficiently, the forms are

removed and the surface is ready for treatment. A finish may be had by hand tooling or by grinding with silicon carbon. In other methods of finish the cement is eliminated from the surface and the color and texture of the aggregates definitely exposed. This may be accomplished by spraying a fine water mist at about 40 pounds pressure upon the face of the piece when the forms are removed. Another method is to brush the surface when 6 to 24 hours old with bristle brushes or with a fine wire mesh. A third method is to clean the surface with 20% to 50% muriatic acid and water.

Since the cement will not take a polish, it is necessary that the aggregates be combined and graded so that they cover almost the entire surface of the face.

The cement, water, and aggregate ratios must be properly adhered to, though any desired surface texture and color combination may be obtained. The material is enduring and economical.

Formulas for Cast Stone and Pre-Cast Concrete

A bulletin on wall construction, sponsored by the Nelson Cement Stone Company, Incorporated, gives a formula for concrete which could be used in the mass construction of the monument. In this test they used a concrete mixture which contained one part cement, 2.8 parts of dry sand and 4.2 parts of dry gravel, by weight. The washed pit gravel had the maximum size of 3/4 of an inch. This formula was used on wall specimens 8 feet high,

3 feet wide and 10 inches thick. The coarse gravel in this mixture would not do for the figures or relief because any chiseling or cutting would tend to knock out the coarser aggregates leaving uneven edges.

André Smith uses 2 parts of clear white sand to 1 part cement. These experiments were on relatively small panels not exceeding 30 x 36 inches. This was done only because of the time element, or setting time, which made it necessary for him to place in his design and cut out the pattern before the mixture became hard.

A variety of good mixtures for casting are as follows:

1. 20% marble dust or granite dust to 80% cement for smooth surfaces.

2. 35% marble dust or granite dust to 65% cement for medium smooth surfaces.

3. 35% marble dust, 15% sand, and 50% cement for rough surfaces.

In experiments on mixtures of granite dust and cement it was found that 2 cement to 3 granite dust gave a very fine texture to the surface. The aggregates were well dispersed though not quite dense enough. Another mixture of 1½ cement to 3 granite dust, with just enough water to keep the mixture together, was vibrated into a wooden box and left to set. When this mixture was taken out of the box the exposed surface had a much denser pattern of aggregates creating a better looking piece. Both of these mixtures are easily chiseled and are good strong mixtures and will stand up well. Other leaner mixtures were

found to be inadequate since they tended to fall apart.

A test slab of cast stone was poured into a form 12 inches wide, 32 inches long and 1½ inches deep. The mix for this test was 1½ cement to 3 granite dust. A layer 3/4 of an inch deep was first poured and a heavy screen was set in at this level to reinforce the slab; with the screen in its proper place another layer of cast stone 3/4 of an inch deep was poured over the entire area making the slab 1½ inches thick. This slab had a very smooth surface due to the fact that the surface side of the slab was poured against a flat piece of plate glass. A drawing of the composition for the relief was drawn upon this slab and then the relief chiseled out. The chisels worked well and good clean edges were maintained throughout except for a few places where air bubbles had formed during the pouring of the cast stone.

Chapter IV

The Monument and Its Construction

The monument is adapted to the sloping terrain upon which it is to be built. Since a structure of this type is dependent on proper lighting, it will have to be placed in a position to take advantage of the summer sun. For this reason the monument will face south and the higher side will be toward the west. (See Plate I, p. 27.)

The monument will be constructed according to government specifications on reinforced concrete, and will be built by a competent construction concern selected by the Chamber of Commerce Committee in charge of the project.

The figures and relief will be composed of cement and granite or marble dust aggregates carefully packed or vibrated into the molds so that the aggregates will show upon the surface.

The models of Wild Bill Hickok, Calamity Jane, and Potato Creek Johnny will be built up in plaster of Paris over an armature. These will then be carved down to the desired proportions. To eliminate the danger of chipped edges and also to facilitate a better casting job, the figures will be kept compact and simplified with no thin sections or sharp protruding edges.

Since the weather varies from freezing to thawing temperatures, it was necessary in the designing of the monument to eliminate the low places which would hold water.

The scale model in plaster of Paris (see photograph, p. 24.) has evolved from a series of sketches in plasticine. This oil clay, due to its plastic qualities, is a very good medium for working three-dimensional pieces. Plasticine will not dry out and is always pliable. Changes in the sketch in this material can be readily made whenever the modeler wishes to do so. Another advantage of plasticine is that it will not adhere to plaster of Paris, making it ideal for removing casts.

Through a process of elimination and altering the monument has lost the billboard effect which it had in the first designs. It now has a massiveness and sculptural quality which is ideal for the terrain and landscape upon which the memorial is to be built.

The models of the bas relief and of the figures will be done in a studio. Each figure will contain an armature, over which the plaster of Paris will be roughly built up to the specified dimensions of the figure. When this is completed and the plaster of Paris is dry the process of chiseling begins, and it is through this cutting that the piece of sculpture will be refined and the masses and volumes brought out. There is to be no intricate detail, only the planes and volumes will suggest the form and composition of the sculptured piece. From these model statues will be taken the sectional molds for the cast stone pieces. (See Plate X, p. 36.)

The model for the bas relief will also be constructed of

reinforced plaster of Paris. A form will be built 16 feet long, 6 feet wide and 6 inches deep. The face side of this form will be lined with sheet metal which will give the plaster slab a smooth surface. The reinforcing rods will be placed midway in the thickness of the model. After the plaster of Paris has hardened sufficiently the forms will be removed and the design for the relief drawn upon the surface of the slab that was against the metal side of the form. The design will then be chiseled out not more than 1½ inches deep. When this is completed this plaster relief will be the model for the one to be poured in cast stone. This model will then be shellacked and oiled and a negative plaster of Paris cast taken from it. Into this negative cast will be poured the cast stone mixture which will be the slab that will be raised into the back wall and concrete poured around it. (See Plate IX, p. 35.)

Chapter V

Dimensions of Monument

The over-all measurements of the superstructure:

32 feet long

26 feet wide

The back wall:

14 feet high

The pillar attached to the back wall:

16 feet high

The relief:

6 feet high

16 feet long

1½ inches deep

The height of each sculptured figure in the round is as follows:

Wild Bill Hickok	9 feet high
Calamity Jane	8 feet high
Potato Creek Johnny	5 feet high

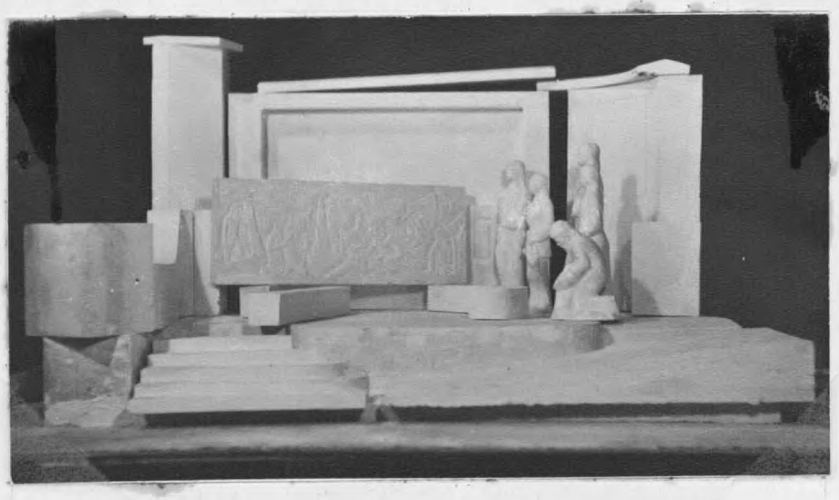
For other measurements refer to plates I, II, III, IV, V, VI.

The superstructure minus the three figures and the relief contains 1405 5/8 cubic feet and, figuring a cubic foot of concrete at 144 pounds*, this would amount, if reduced to tons, 101.205 tons.

*Gay, Charles Merrick, and Parker, Harry. 1946. MATERIALS AND METHODS OF ARCHITECTURAL CONSTRUCTION. John Wiley and Sons Inc., New York.

Photograph of Model Monument Cast in Plaster of Paris

Photographs Showing Sections of Model Monument



1 Showing sections with bas relief taken out of wall

2. Showing sections with bas relief in back wall.

Photographs of the Molds and Cast Figures

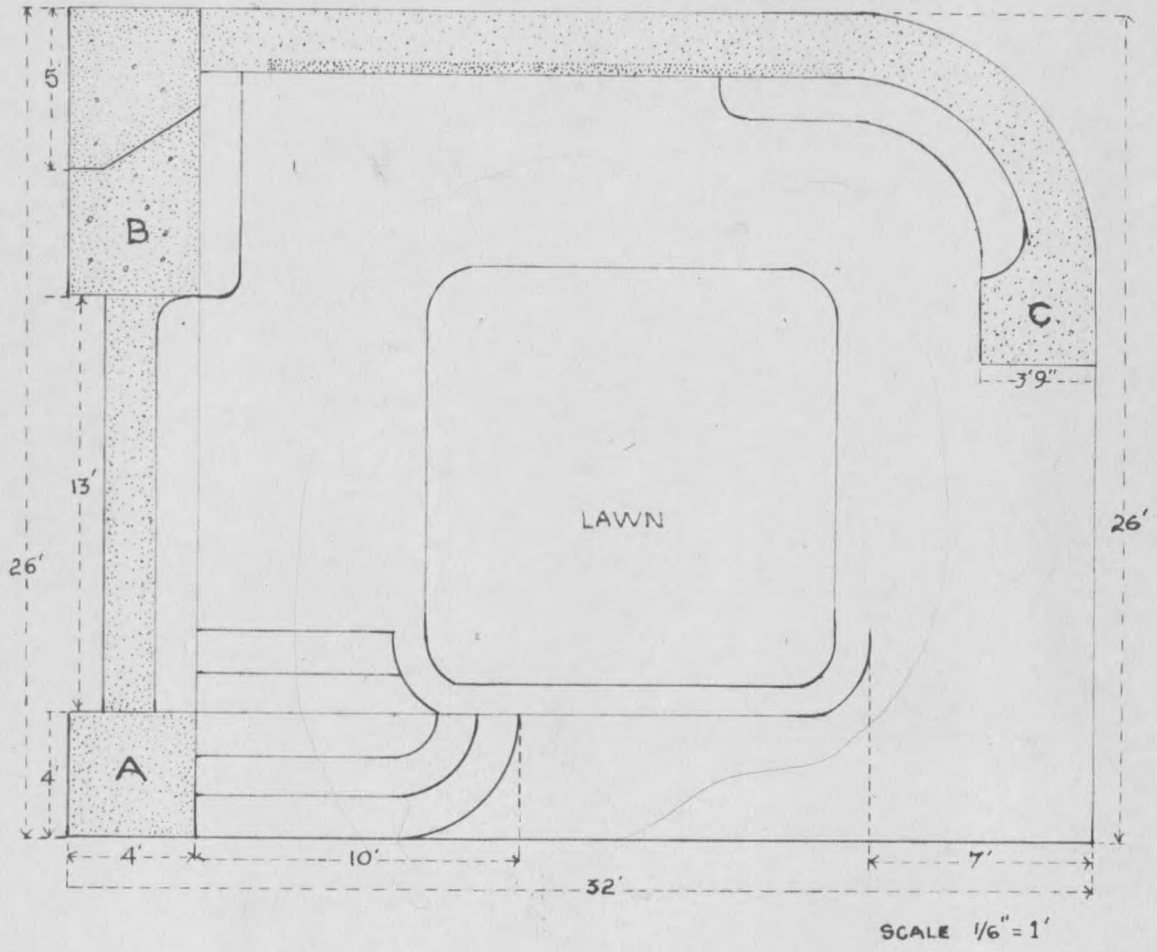
Potato Creek Johnny

Calamity Jane, Wild Bill Hickok and Potato Creek Johnny

Wild Bill Hickok

Calamity Jane

PLATE I.



SCALE 1/6" = 1'

BIRDS EYE VIEW OF MEMORIAL

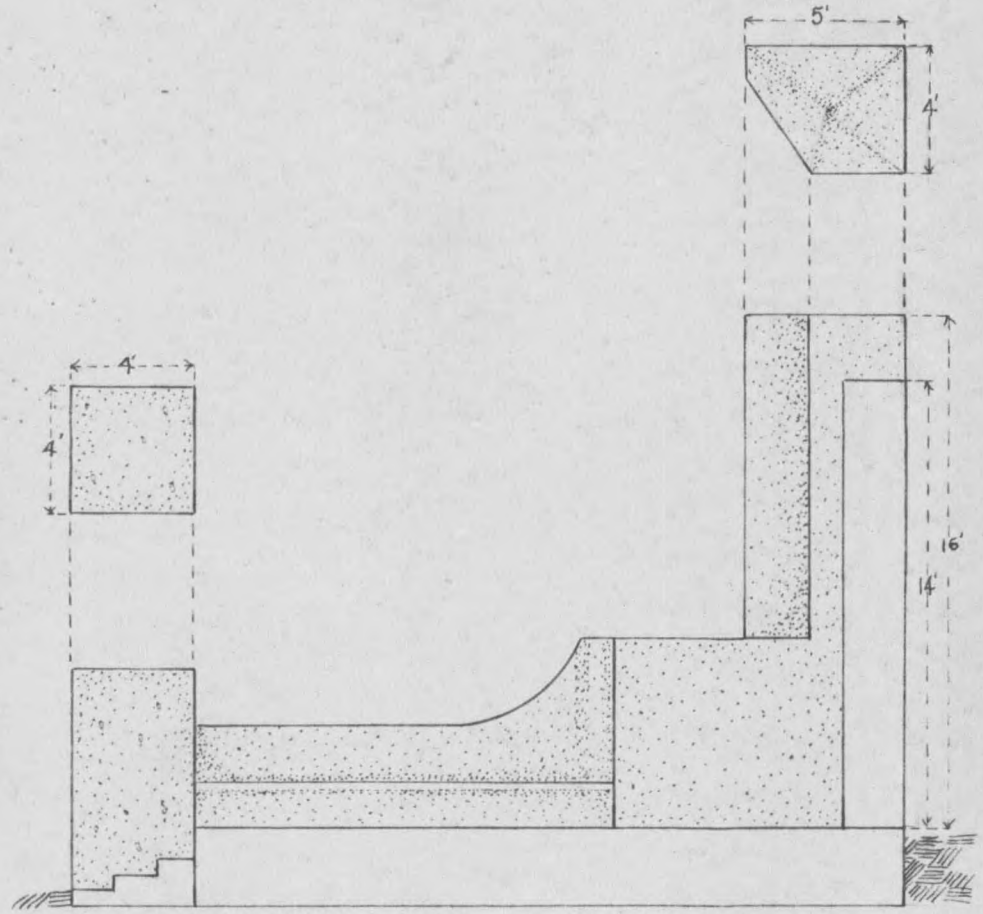
PLACING OF STATUES

A - POTATO CREEK JOHNNY

B - WILD BILL HICKOK

C - CALAMITY JANE

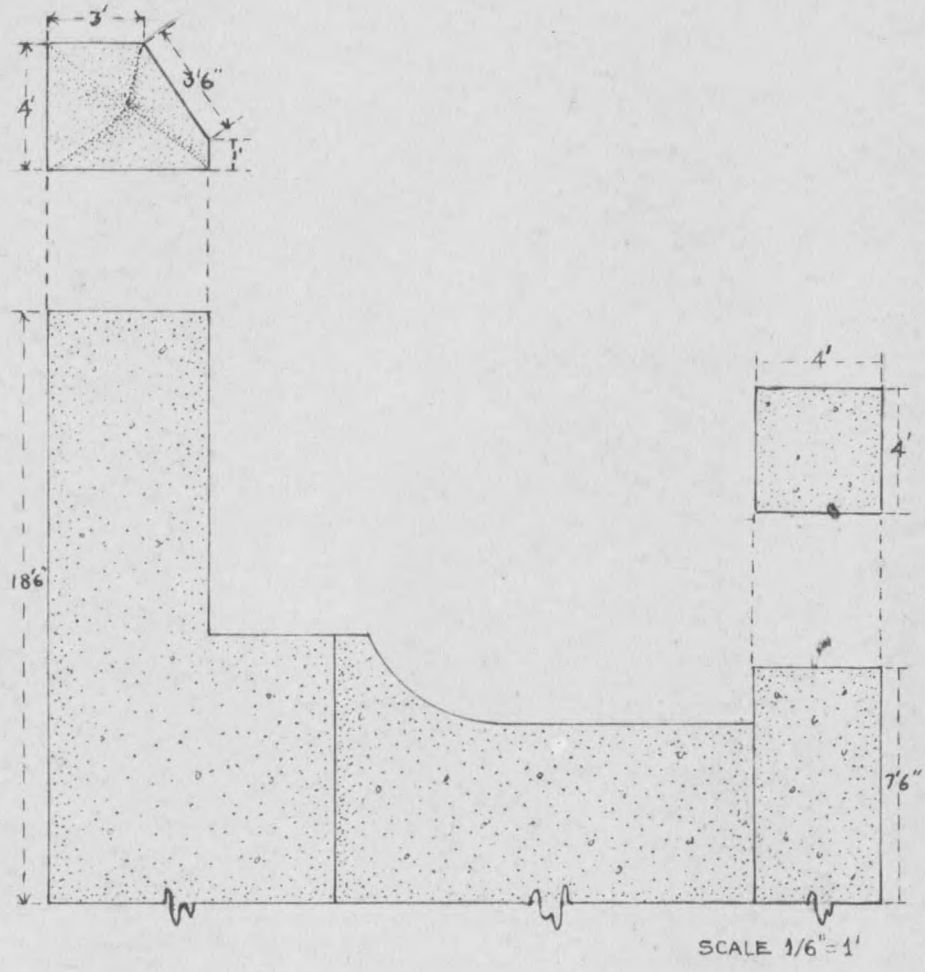
PLATE II.



SCALE 1/6" = 1'

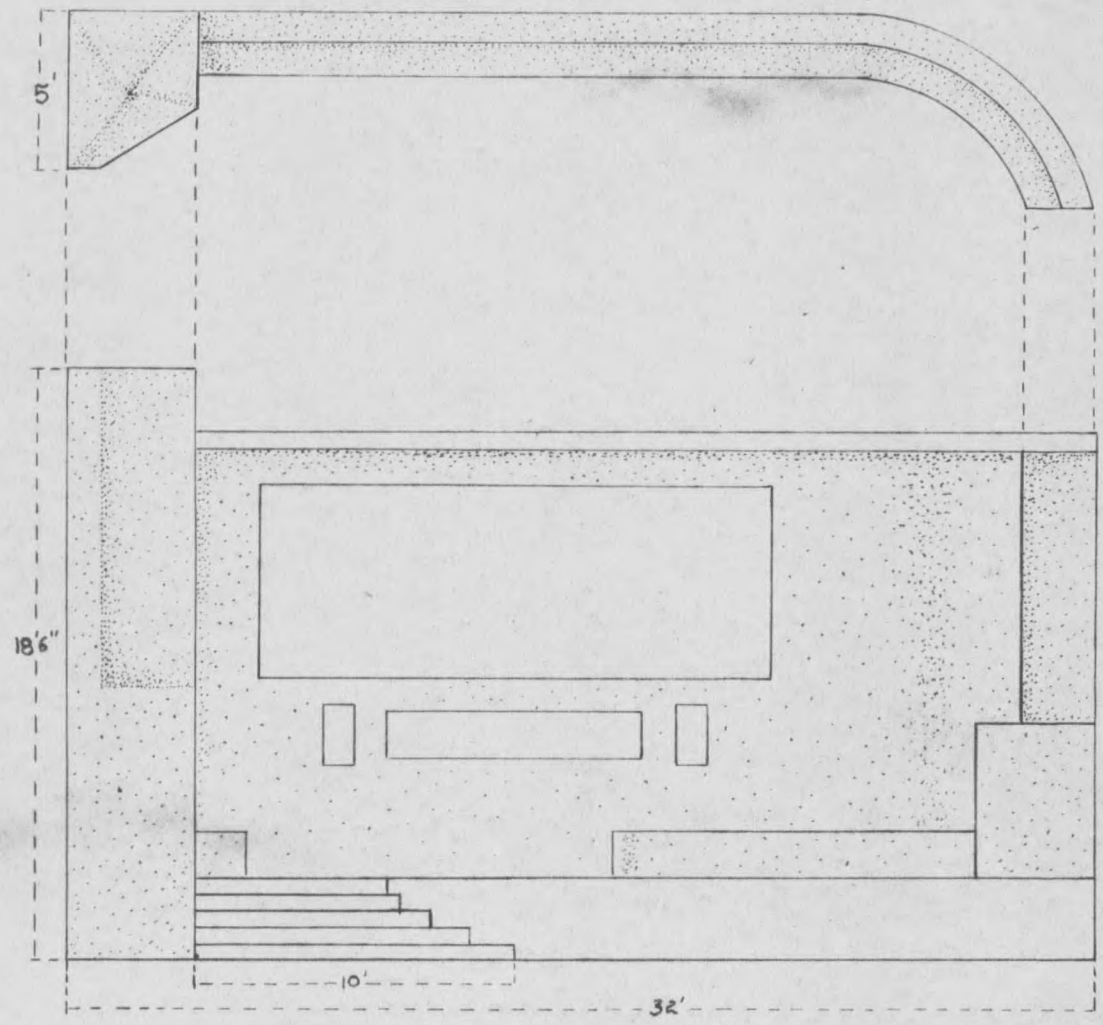
INSIDE VIEW OF LEFT WALL

PLATE III.



OUTSIDE VIEW OF LEFT WALL

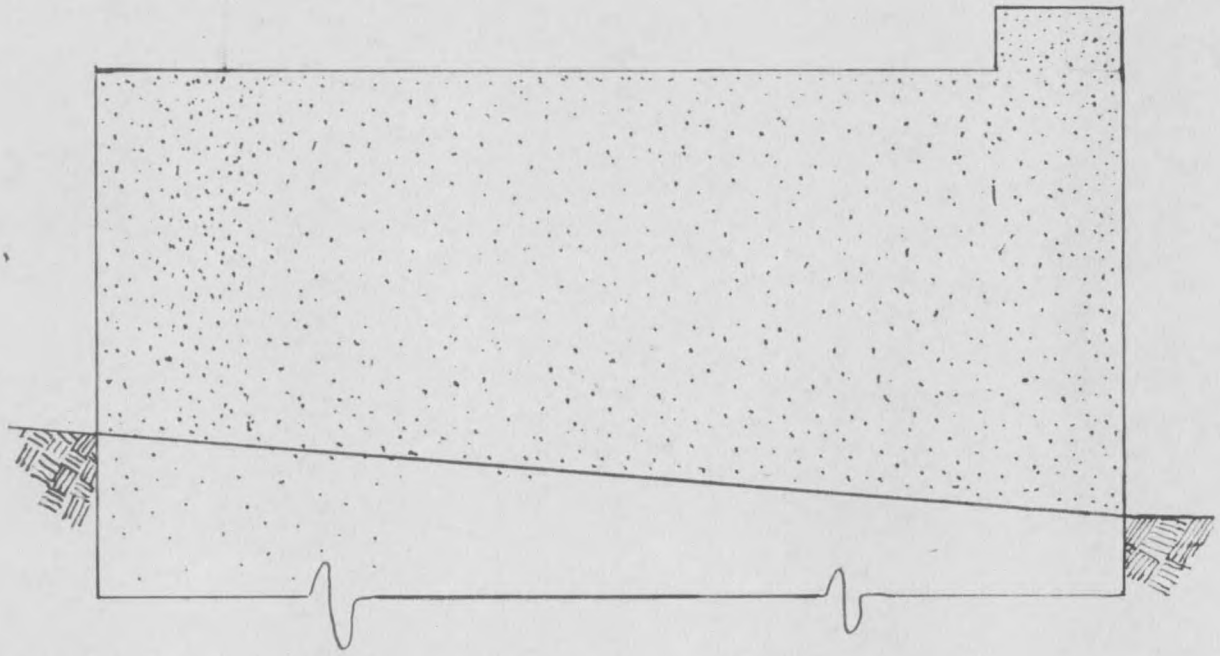
PLATE IV.



SCALE 1/6" = 1'

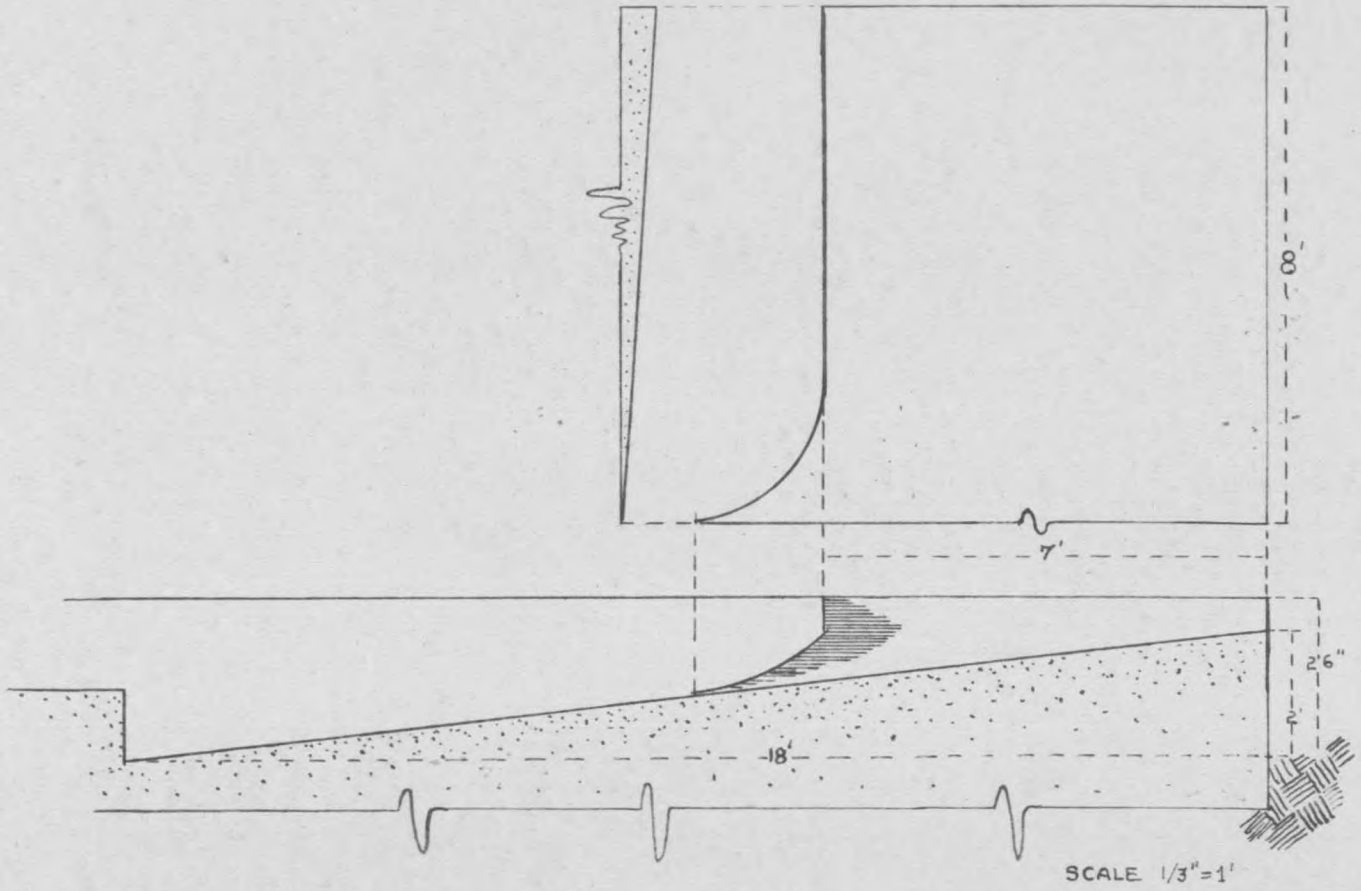
FRONT AND TOP VIEW OF BACK WALL

PLATE V.



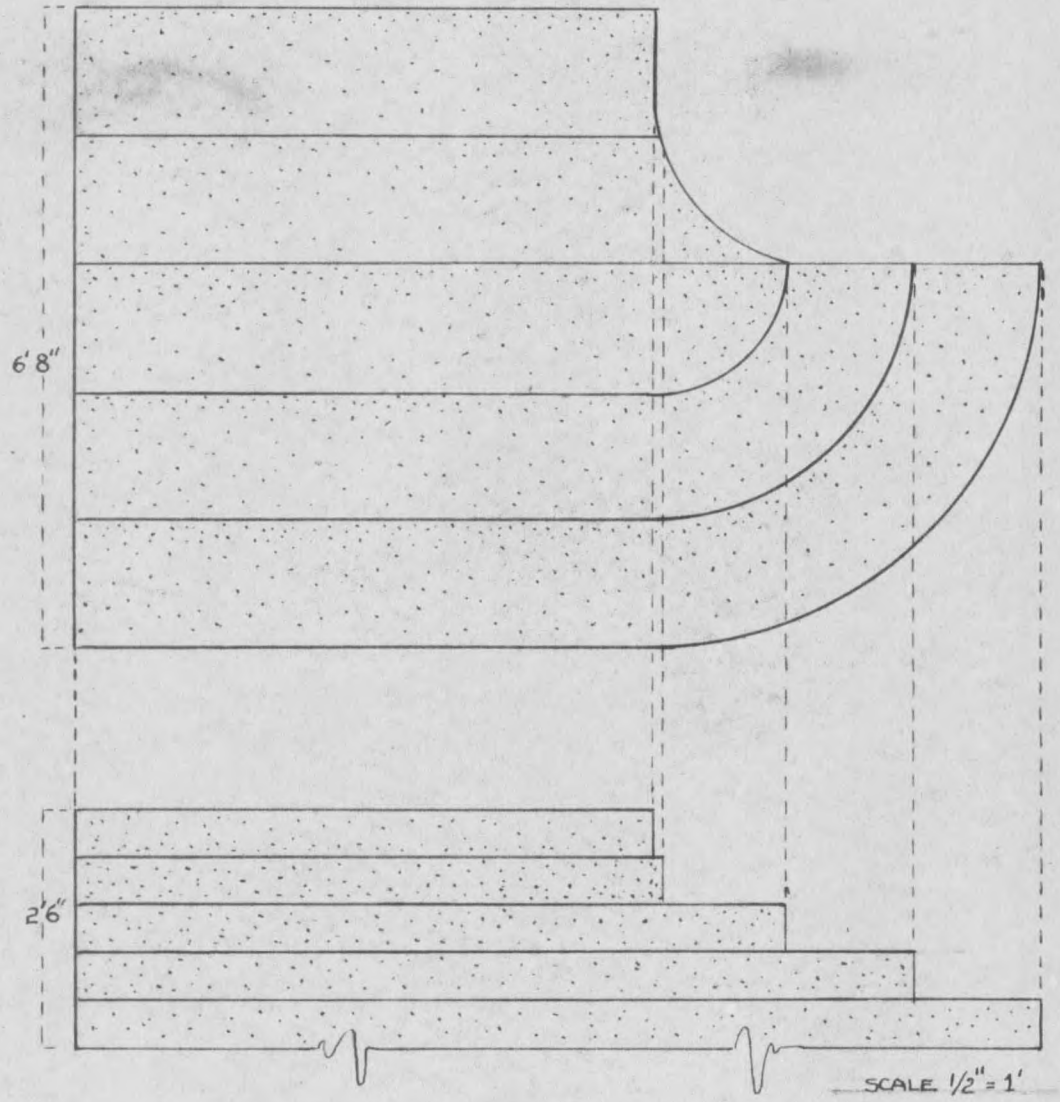
BACK VIEW OF MONUMENT SHOWING GROUND LINE

PLATE VI.



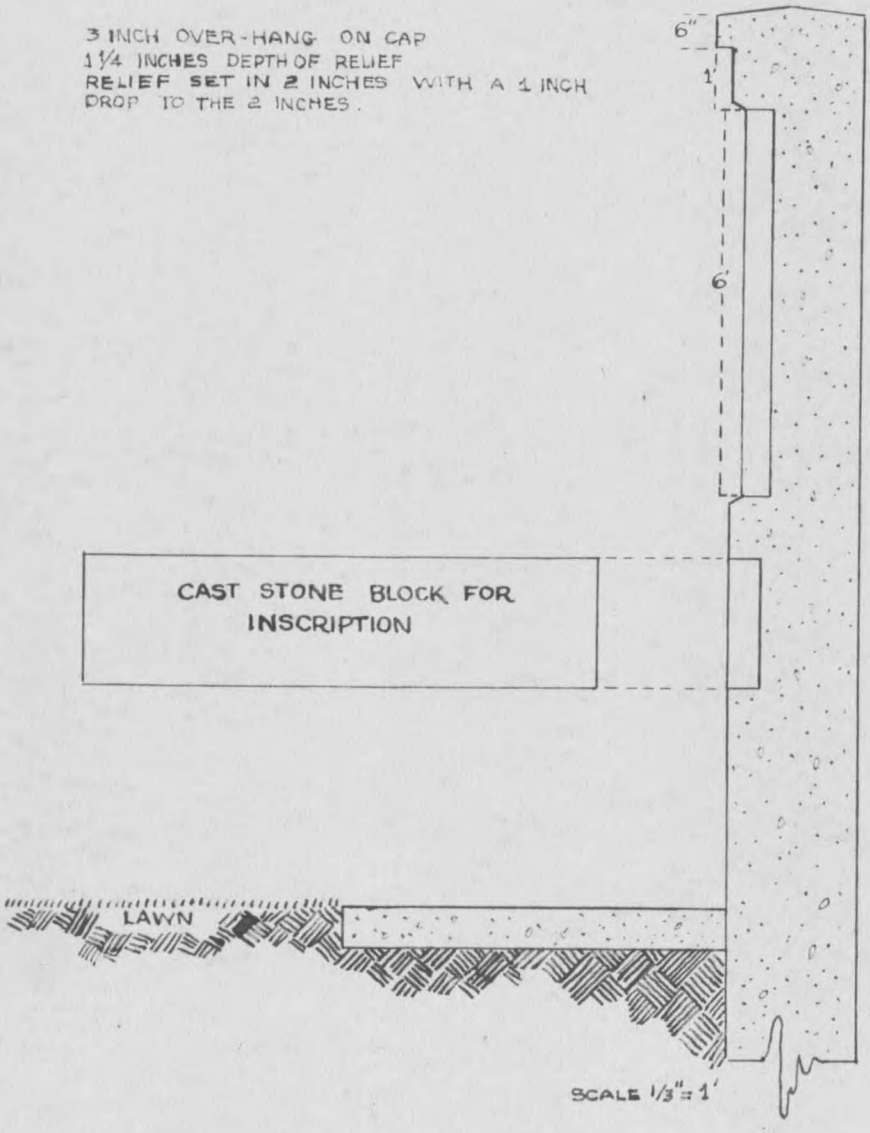
FRONT VEIW OF RAMP AND TOP
SECTION
A 2 FEET RISE IN 18 FEET

PLATE VII



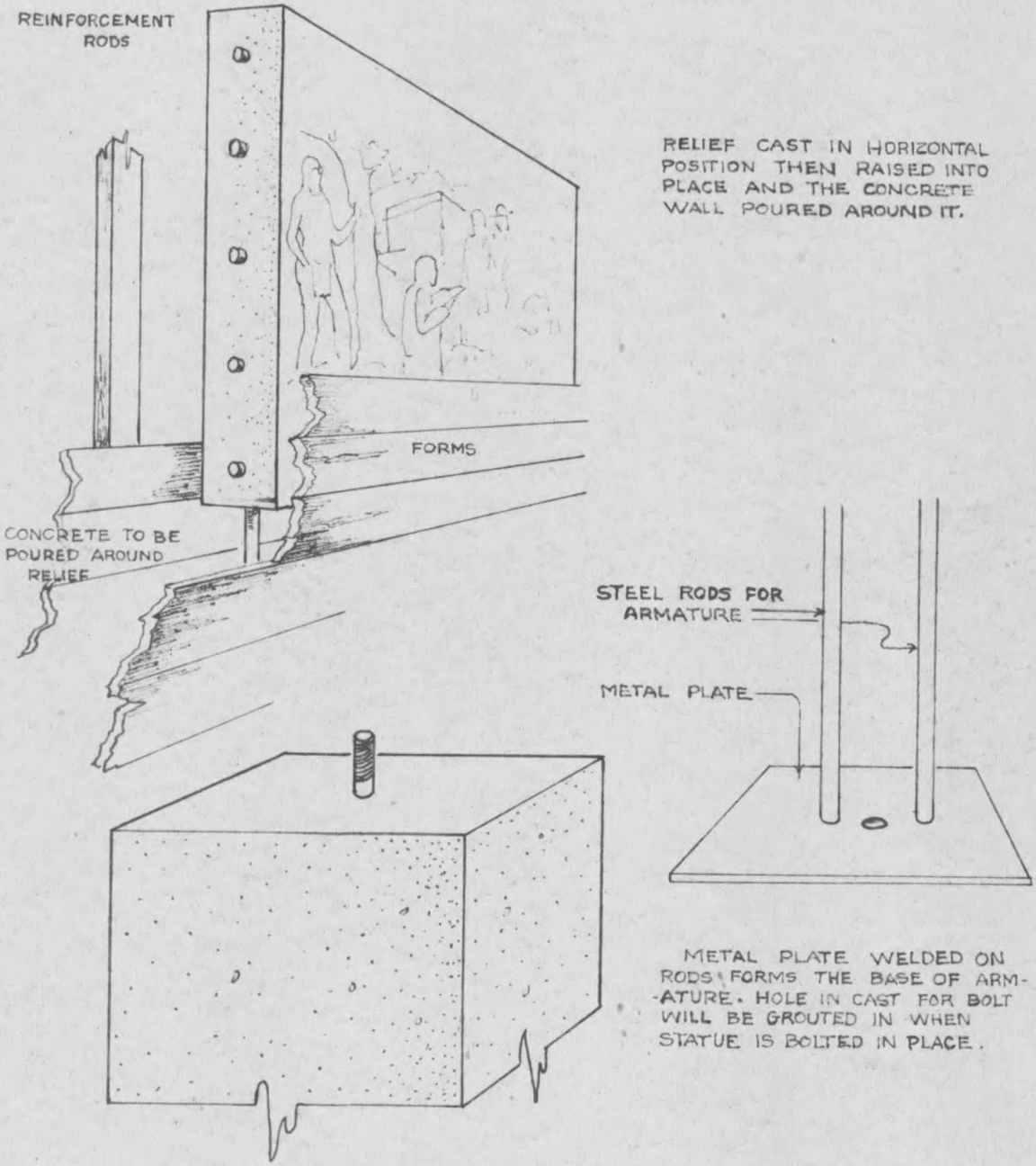
FRONT AND TOP VIEW OF STEPS

PLATE VIII.



CROSS SECTION OF BACK WALL

PLATE IX

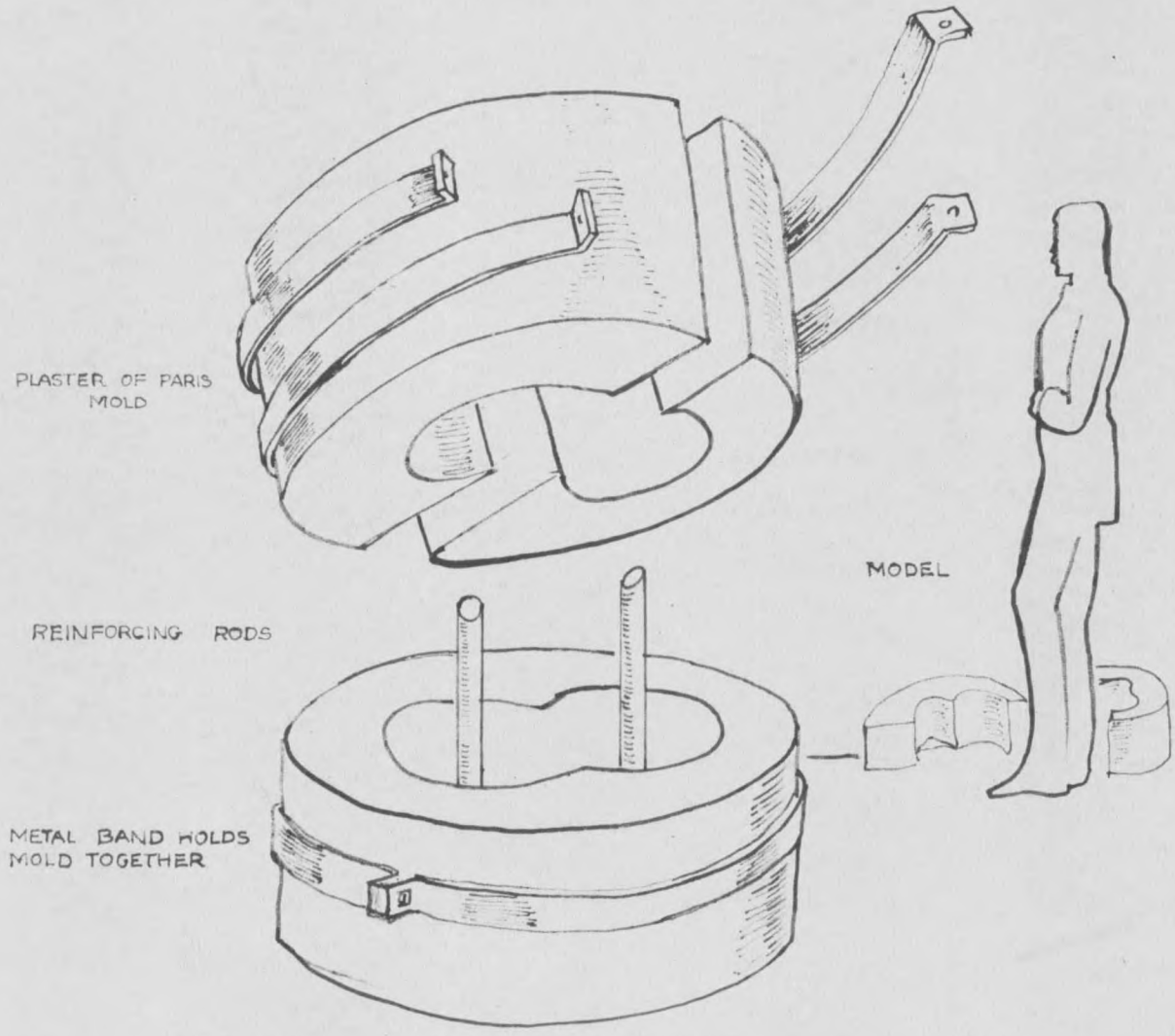


RELIEF CAST IN HORIZONTAL POSITION THEN RAISED INTO PLACE AND THE CONCRETE WALL POURED AROUND IT.

METAL PLATE WELDED ON RODS \ FORMS. THE BASE OF ARM-ATURE. HOLE IN CAST FOR BOLT WILL BE GROUTED IN WHEN STATUE IS BOLTED IN PLACE.

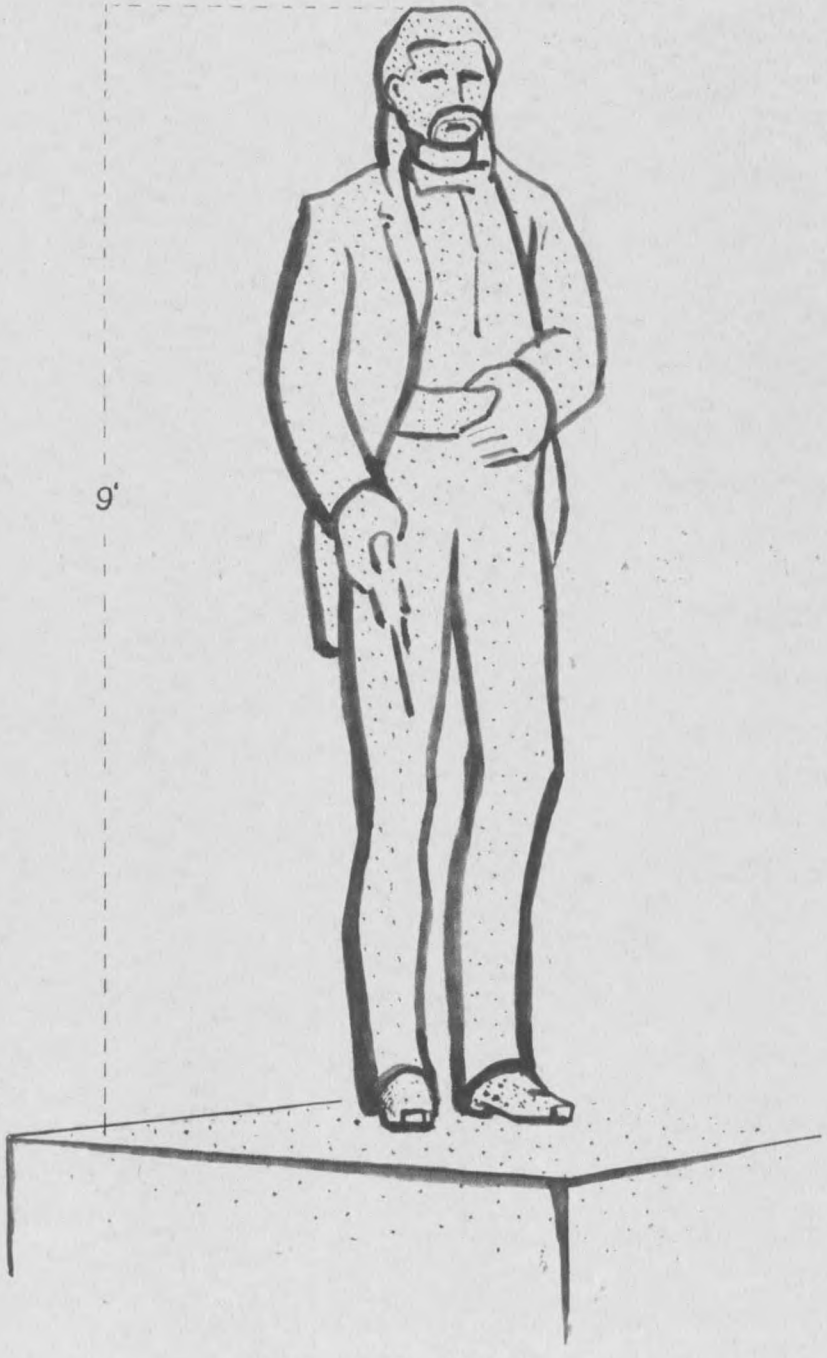
SKETCH OF RELIEF AND ARMATURE

PLATE X



SKETCH SHOWING THE METHOD OF SECTIONING MOLD, CAST FROM MODEL.

PLATE XI



WILD BILL HICKOK

PLATE XII

POTATO CREEK JOHNNY

PLATE XIII

CALAMITY JANE

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