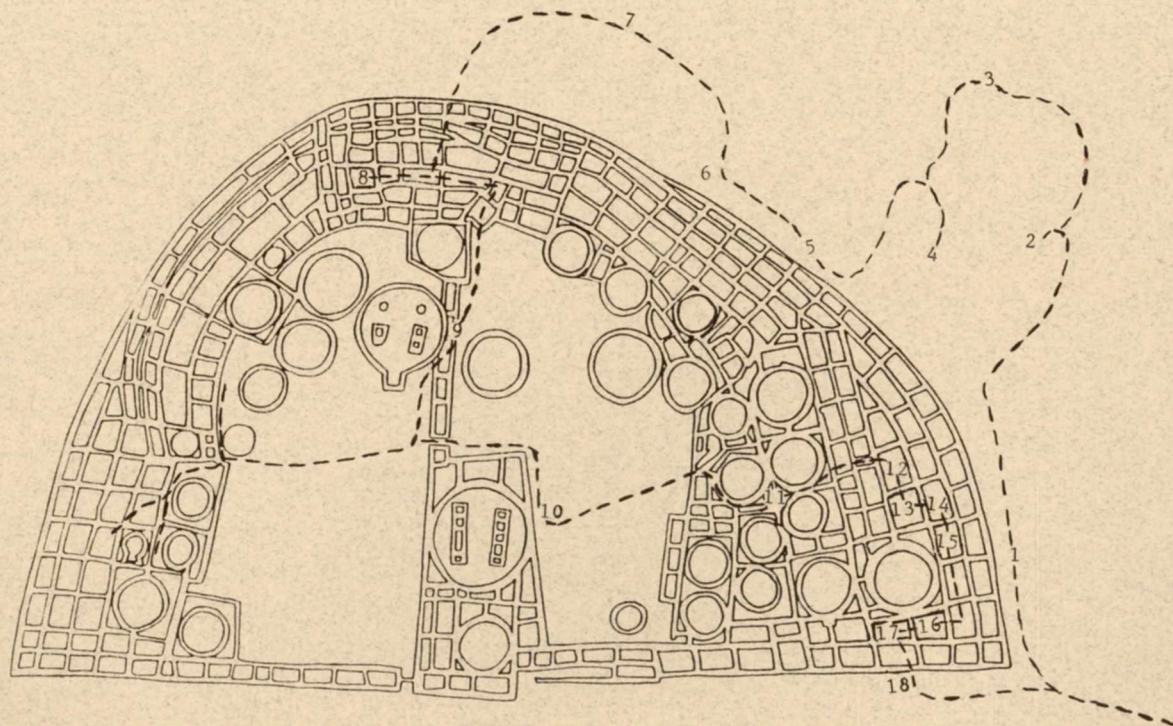
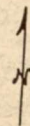


Pueblo Bonito



PUEBLO BONITO



PLEASE STAY ON TRAIL AND OFF RUIN WALLS

Welcome to Pueblo Bonito

To use this trail guide, follow the numbered stops along the trail which correspond to the numbers in the text. While exploring Pueblo Bonito, this guide will enable you to recognize several unique characteristics of Chacoan architecture.

The trail through Pueblo Bonito is 0.6 mile long. The gravel trail that goes along the southeast corner of the ruin is wheelchair accessible but assistance is recommended. To reach this alternate route, follow the south wall past Stop 18 to the plaza entrance.

The archeological resources in Chaco Culture National Historical Park are fragile, irreplaceable, and a significant part of our cultural heritage. The park received international recognition for the cultural resources it contains when Chaco was designated a World Heritage Site in 1987. You can help us protect and preserve this part of our global cultural heritage by following these basic rules. Stay on the designated gravel trails. Do not walk, climb, stand, sit, or lean on the walls. Do not deface, add to, or alter the rock art. Do not collect pottery or other artifacts anywhere in the park. If we all take responsibility for these resources, they will be here for the education and enjoyment of future generations.

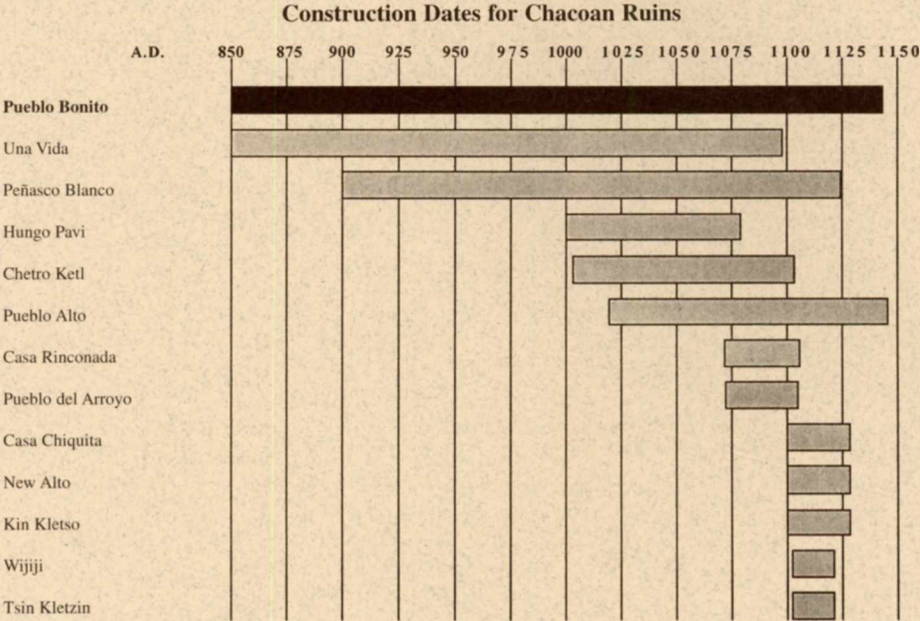
For your safety, do not climb canyon walls, or onto the mesa except via a designated trail. Children should remain with the guardian responsible for their safety.

Pets **are not** allowed in the ruins.

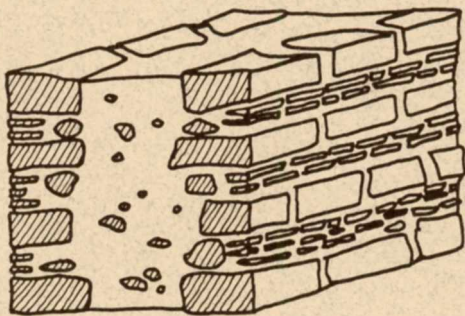
The name Pueblo Bonito is Spanish for “beautiful town.” Carravahal, a guide from San Juan Pueblo, provided Lt. James Simpson with the name during a military expedition that came through Chaco in 1849. Following the expedition, Simpson published the first detailed description of the ruins in Chaco Canyon.

Anasazi, a Navajo word which translates as “Ancient Ones” or “Ancient Enemies,” is the term archeologists use to refer to the culture that began about 2,500 years ago and was centered in the Four Corners region. The Anasazi Indians were the builders of the large pueblos that were constructed in Chaco Canyon from approximately A.D. 850 through 1150.

Pueblo Bonito is the most celebrated and most thoroughly investigated site in Chaco Canyon. Constructed in stages over a thousand years ago, Pueblo Bonito epitomizes the great pueblo architecture found here. Archeologists specializing in Chacoan archeology use the term “great house” to describe large sites like Pueblo Bonito. Great houses display a particular set of attributes, including planned layouts, multi-story construction, distinctive masonry, very large rooms, and circular subterranean chambers called “kivas.” Pueblo Bonito exhibits all of the characteristic elements of great house construction, all of which you can see along this trail.



1 Chacoan walls are referred to as “core-and-veneer” masonry, and are a hallmark of great house construction. You are looking at the facing stones of the wall (the veneer). The core consists of roughly shaped pieces of sandstone laid in mud mortar, which is faced with carefully



Core-and-veneer

selected shaped stones to create the veneer. There were several types of veneers used in great house construction, and they changed over time. Today these pattern variations in veneer provide archeologists with a tool for dating site construction.

After the walls were built and roofed, a plaster coating was applied over most of the walls that concealed this fine

stonework. This helped protect the mud mortar from rain. It also decreased maintenance because it is easier to reapply mud plaster than to repair the mortar joints of the walls.

Walking up the trail to the next stop, you will see several mounds on your right. These mounds contain construction debris. The large mound closest to the cliff conceals a great house, and in the mounds between Pueblo Bonito and Chetro Ketl, there may be portions of a masonry wall that would have connected these two structures during their occupation.

2 These enormous blocks of sandstone are what remain of Threatening Rock. Prior to its collapse in 1941, the rock was a detached segment of the cliff wall that was separated from the cliff by a wide crack. It measured about 97 feet high, 140 feet long, 34 feet thick, and weighed an estimated 30,000 tons. Looking along the canyon wall behind you, you will see a massive vertical boulder that resembles Threatening Rock before it fell.

The Anasazi builders chose this location even though they recognized the threat of a fall. They built a supporting masonry terrace below the rock, which slowed the erosion of soil from below the rock, delaying its collapse. To your right, you can see what remains of this terrace.

3 The imposing cliffs surrounding the canyon provided the stone from which the Chacoans built the impressive structures that are found here. Two types of stone were used for construction. The first was a hard, dark brown stone quarried from the upper canyon walls. The second was the blocky, light tan stone that is found along the lower walls of the canyon. The laminated dark brown stone used in earlier construction appears to have been the preferred building material. It is harder and breaks more readily at right angles to the bedding plane. This provided the builders with usable pieces that could be easily shaped and incorporated into the intricate stone patterns found in these walls.

4 From here you can see the large scale and geometric design of Pueblo Bonito. As with most of the other great houses in the canyon, the layout was the result of several building stages and was not a single construction event. From initial construction in the middle of the ninth century, three hundred years elapsed before the present form of Pueblo Bonito was realized.

The number of rooms in this structure suggests that many people lived here. The first archeologists working in Chaco estimated a population of 20,000 to 30,000 for the entire canyon. These estimates were based on the number of rooms in all of the known sites in Chaco. With continuing archeological research, population estimates have been lowered to between 4,400 and 6,000 people. The lower estimates are based upon a variety of approaches for determining population size.

The number of known firepits, the amount of arable land, and the quantity of pottery vessels are some of the data that have been used to estimate population.

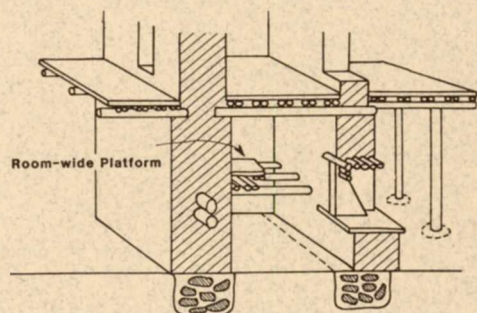
5 This broken cross section of wall displays its massiveness and how well it was designed. The height of the first story determined the width of the wall. Wall width decreased with each additional story, lightening the load on the massive base. This type of wall construction ensured strong and stable walls at heights of four or five stories. Decreasing wall widths also demonstrate advance planning on the part of the builders. Second and third stories were planned before the first story was built.

Great houses were built more substantially than other Anasazi structures in the San Juan Basin, but it is not certain for what purpose. Substantial walls were necessary for multi-storied design, but the overall massiveness of the structures may have served other functions. Pueblo Bonito, along with the other great houses found here, may

have been used primarily for religious or political functions, rather than serving individual family needs. The massive scale and attention to detail in construction also reduced building maintenance, which would have been particularly important if the resident population was small or seasonal. Whatever the reason, substantial portions of the great houses in the canyon are still intact eight-hundred-years later because they were so well constructed.

6 This back wall was built during the second construction phase at Pueblo Bonito, approximately A.D. 1040 to 1050. It included a row of rooms around the exterior of the first phase rooms, creating a new back wall. The earlier rooms did not have exterior doorways, so access to the new arc of rooms was not possible. There were interior doorways between all the new rooms and several doorways in the new exterior back wall.

When these rooms were excavated, many of them contained shelves or platforms across the short axis of the room. These “roomwide” platforms were constructed midway between the floor and ceiling, extending from the side wall about four to five feet towards the center of the room. One interpretation of these platforms is that they functioned



Roomwide platform

as shelves, measurably increasing the storage capacity of a room. These features and the restricted accessibility to these rooms, have led others to suggest they may have been used as sleeping platforms. There is no conclusive archeological evidence regarding their use.

7 The doorways to your right lead into rooms that were used by Richard Wetherill at the turn of the century. Wetherill, who was a rancher and an archeologist, and George Pepper, from the American Museum of Natural History, were the first to excavate at Pueblo Bonito. After they completed their excavations in 1899, Wetherill remained in the canyon, homesteading and operating a trading post until his death in 1910.

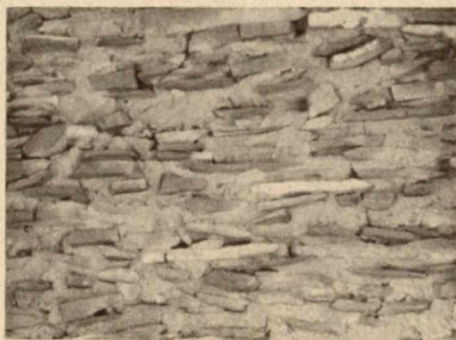
Wetherill and Pepper began their excavations in Pueblo Bonito in 1896, and by the time they were finished, they had excavated 190 rooms. They located, photographed, and mapped all of the major structures in the canyon. In addition, they recorded Anasazi irrigation systems, stairways, roads and water catchment areas, and sponsored other researchers including a physical anthropologist and a geologist. Overall, they contributed immensely to the early archeology of Chaco Canyon.

8 This is the oldest section of Pueblo Bonito, dating from about A.D. 850 to the late 900s. This early construction consisted of about one hundred ground-floor and upper-story rooms, including some sections that were three stories high. Three to five round pit structures (kivas) were built in front of the multi-storied, crescent-shaped block of rooms, completing this stage of construction. As with most great houses, this early section was incorporated into the bulk of the structure during subsequent stages of construction. Several different masonry styles are represented in these walls including the earliest type that was used in great house construction. Identified as Type I, it is distinguished by thin rectangular-shaped pieces of sandstone laid in mud mortar. Type I Walls required more maintenance than later types because the mud mortar joints were larger. When exposed to the elements, it would

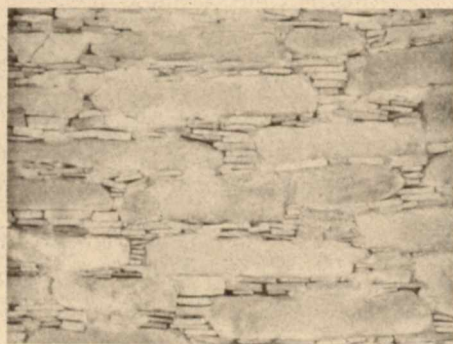
have been necessary to regularly repair mortar damage to maintain the wall.

9 This open area is well defined by multi-storied roomblocks to the north, east, and west, and by a single-story row of rooms to the south. It is referred to as the plaza, which is a term borrowed from later pueblo architecture used for a similar feature. Along the front of the roomblocks, large firepits were dug, and several kivas were constructed in the plaza. The archeological record provides few clues to the specific use of the plaza area, but based upon modern day use, a great deal of activity took place here. Today, plazas provide a place for people in the community to gather for informal activities as well as ceremonial events.

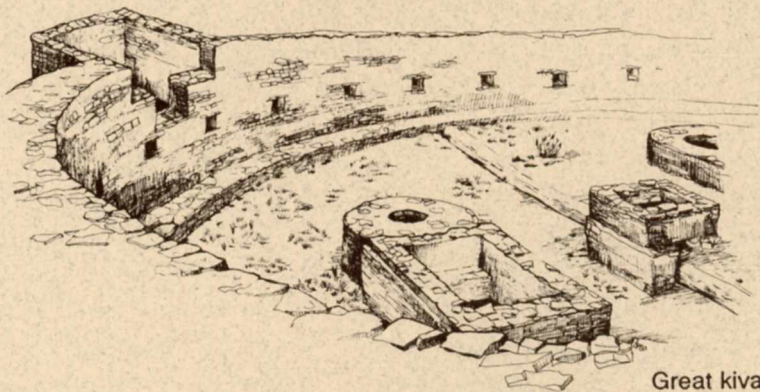
The plaza of Pueblo Bonito is divided into eastern and western halves by a central dividing wall



Type I



Type II



Great kiva features

that is aligned with true north. There was only one entryway into the plaza, which is located in the southeast corner of the western half of the plaza. (The present opening in the eastern section resulted when a room collapsed.) When the original entrance was first constructed, it was over seven feet wide. During a later construction phase it was remodeled and reduced to a door less than three feet wide, and even this small door was subsequently blocked. One of the original excavators interpreted this as a defensive measure, suggesting there was a pressing need for this deliberate and progressive closing in of the pueblo.

10 This very large, round subterranean structure is a great kiva. They are characteristic of great house construction and include a set of highly standardized architectural features. These include a low masonry bench around the base of the room,

raised floor vaults, a raised fire-box and deflector, pits for seating four wooden posts or masonry pillars used to support the roof, and an antechamber and entryway at the plaza level of the subterranean structure. The size, standardization in construction, and investment of labor exhibited in great kivas indicates they may have served a highly specialized public function that met community-wide needs. In the plaza of Pueblo Bonito, there were at least three great kivas.

An additional feature that is frequently found in Chacoan great kivas is a set of wall crypts or niches. Wall niches may have functioned as depositories for offerings and ceremonial paraphernalia, or possibly served as open shelves for the display of ceremonial objects. Supporting evidence for these interpretations is the recovery of beads, pendants, and ornaments from the niches in one of the great kivas at

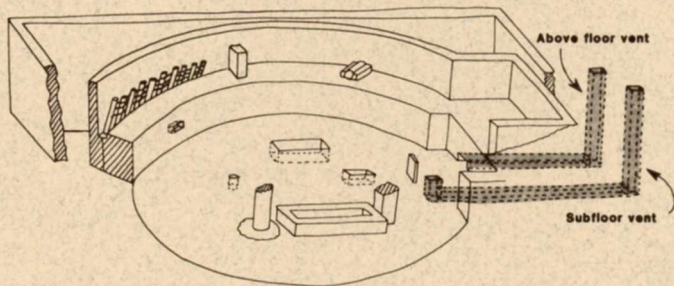
Chetro Ketl. When these niches at Pueblo Bonito were exposed during the excavation of this great kiva, they were empty.

11 In describing the architecture of the modern Pueblo Indians, the term kiva is used to refer to round rooms used for ceremonial purposes. This term has been applied to the round rooms found in Chaco and other prehistoric sites in the Southwest. Although it is not known whether the prehistoric kiva was used exclusively for ceremony, this architectural form dates back to the earliest Anasazi pithouses, around A.D. 400.

Neil Judd, who excavated at Pueblo Bonito from 1921 through 1927, identified several features of kivas in Chaco that distinguish them from kivas in other Anasazi settlements. Judd defined the “Chaco-type” kiva as including a low masonry bench encircling the base of the room with a short recess usually to the

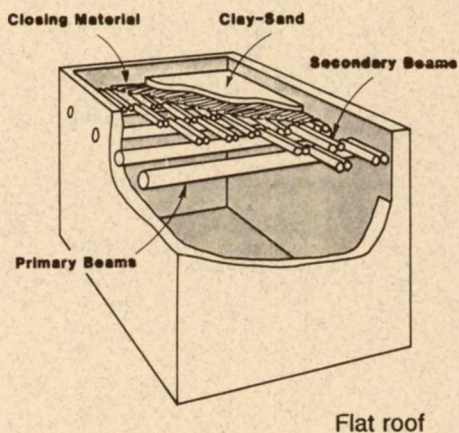
south, low masonry boxes called pilasters built on the bench as roof supports, a firepit, a sub-floor ventilating system, and a sub-floor vault. Additional research has expanded this list of features to include the elevation of the room to an above-ground square enclosure, which can be seen in the kiva to your left, and a characteristic bench backing referred to as wainscoting. The kivas in this section of Pueblo Bonito include all of these features except for the bench backing.

12 In this room, there are remnants of original plaster as well as primary and secondary roofing beams known in Spanish as “vigas” and “latillas.” Vigas are the primary beams and carry the weight of the roof. Latillas are secondary supports and were laid perpendicular to the primary beams. Split shakes of juniper wood, bark, and matting were then laid over the secondaries. A layer of clay mor-



Sub-floor ventilation system

tar or packed adobe was applied over this, and the surface was completed with a final layer of sand.



The size of this room is characteristic of the rooms built in Chacoan great houses between A.D. 900 and 1150, with large floor areas and very high ceilings. The present surface is elevated above the actual floor level due to the protective fill. Before leaving this room, note the masonry-filled doorways. These can be seen throughout the great houses in the canyon and are usually the result of architectural modifications completed by the Anasazi builders. Closing rooms off could have been done to conserve heat, or it may have indicated a change in the use of the room, such as from domestic use to storage.

13 The function or use of a room is often difficult to determine in prehistoric buildings. One of the ways archeologists try to determine room function is through architectural features found at the time of excavation. These may include sandstone slabs used to grind corn or grains, mealing bins, or firepits. Another is through examining the artifacts that are recovered, and studying their placement upon excavation. The large rooms in this section of the pueblo would have been inadequate as domestic dwellings. Because of their size, they would have been difficult to heat, and

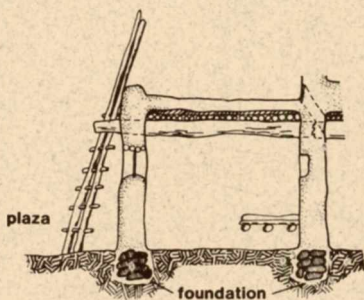


Mealing bins

they would have been dark because they are interior rooms. When these rooms were excavated most of them lacked domestic features. The lack of room features, such as mealing bins or hearths, and the lack of artifacts suggest they may have functioned as storage rooms.

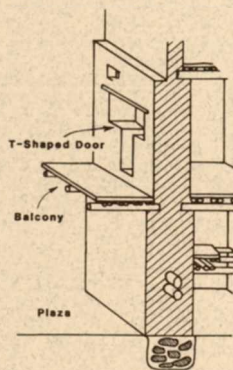
14 Between A.D. 1075 and 1115, the east and west wings of Pueblo Bonito were constructed, including this room. This was the most extensive building phase in the canyon and one of the last. There are several methods for dating and identifying building phases including the science of tree-ring dating known as “dendrochronology,” and the analysis of masonry styles and ground plans. The way walls meet or “abut” is another method for identifying construction sequences. Abutted walls do not interconnect at corners but instead are flush with each other. Walls that abut one another were constructed at different times, while walls with stones that interconnect at the corners were typically built at the same time.

15 Before wall building began, the layout of the structure was determined by constructing foundations. If additions to the original plan



Cross section of foundation

were made during construction, foundations were added, while deletions from the plan left unused foundations. Beneath the floors in this section of Pueblo Bonito and extending to the east, a maze of unused wall foundations have been located during excavations. They consist of trenches that are about eighteen inches wide and deep, filled with stone rubble set in clay mortar. Foundations would have prevented uneven settling of the walls and added durability.



T-shaped doorway

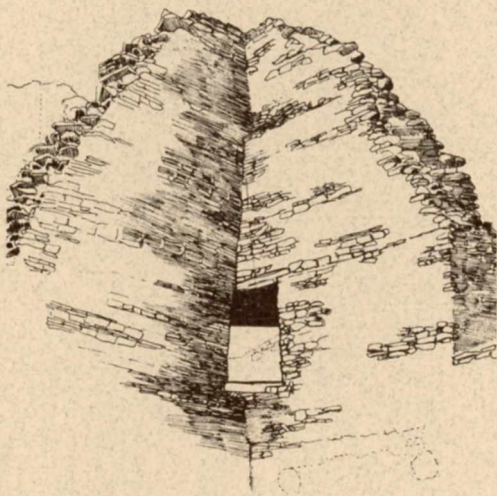
16 There are at least four types of doorways that have been used in great house construction; small doors with high sills, large doors with low sills, corner doorways, and T-shaped doors. The most common type is the small door with a high sill and the most elegant is the T-shaped door. Although the meaning of the T-shape is not clear, their placement appears to be restrict-

ed to special locations in the buildings. They usually open into plazas, or onto balconies or terraces.

17 You can see both original vigas and latillas in the well preserved ceiling of this room. The upper-story floors and exterior roofs of great houses consisted of large vigas, latillas, split shakes, and layers of mortar and sand known as “closing material.” In 1991, cores and samples were taken from these beams for tree-ring dating. Sampled areas are visible as freshly sawed sites and circular depressions in the vigas and latillas. When these beams were sampled, the latest cutting dates were around A.D. 1082, indicating roof construction sometime after that date.

18 If you turn around and look above and to the left of the rooms you have just left, you will see a corner doorway. This is an unusual type of door opening used in great house construction. Only seven are known in Pueblo Bonito, and all of them were

built during later construction sequences in the eastern part of the pueblo. This particular doorway appears to function as an astronomical marker. When the sun rises on the morning of the winter solstice, rays of sunlight pass through this opening and strike the opposite corner of the room behind it. Throughout the canyon, there are other architectural features, as well as modified land forms, that correspond with astronomical events. This knowledge of astronomy seems to have been an integral part of the construction plan at Chaco.



Corner door

The earthen mounds that you pass as you leave Pueblo Bonito were originally identified as trash deposits, known as "middens." Although they contain trash, they also include sand and construction debris. These rectangular mounds are enclosed by masonry walls raised about ten feet above the surrounding ground level. The tops of the mounds were leveled, and they were accessible via stairs. This combination of features strongly suggests the

mounds are planned architectural features. Some archeologists believe these earthen mounds tie in with the series of Anasazi roads and are part of the great house landscaping. Similar mounds are found in association with roads and formalized entrances to other great houses, such as Pueblo Alto, Peñasco Blanco, and Kin Ya'a.

Read More About It!

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Text by Kim McLean



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