

Roads and “Cast Up” Highways

Remains of an Ancient Nephite Culture

Lynn and David Rosenvall, November 2013

In our article, *Searching for Book of Mormon Ruins*, we suggested that “cast up” highways and roads are probably the most expansive man-made structures mentioned in the Book of Mormon. We also illustrated, through an analysis of all structures noted in the text of the Book of Mormon, that remnants of roads and walls would be the most identifiable on the land today (see a reprint of this analysis, *Inventory and Plausibility of Identification of Book of Mormon Structures*, at the end of this article). This reasoning is supported by field work in Baja California. In that land, we and others have found that remains of old roads, stretching for hundreds of miles, are the most visible expressions of a past civilization.

These remnants of “cast up” highways are not only clearly evident on the ground in Baja California, much like remains of ancient Roman roads in the Old World are still visible, but especially from space using satellite imagery from *Google Earth*. We have been struck by the essential positioning of these time-worn “cast up” roads that extend for significant distances between our proposed Book of Mormon lands and between our proposed locations for Nephite cities, especially within the land of Zarahemla where we have identified over 400 miles of roads. Their alignment, construction and engineering appear to be better than the rather basic and



Ancient “cast up” roads south of San Ignacio, Baja California, in proposed location of the land of Zarahemla.

quickly built “Camino Real,” or Royal Road the Jesuit missionaries and their followers built in the 1600s and 1700s to connect their mission centers along the length of Baja California and Alta California (see, Harry W. Crosby, *The King’s Highway in Baja California*, Copley

Books, 1974). It appears that the Jesuits, where possible, restored stretches of preexisting roads to develop their “Camino Real.”



A few of the many ancient (cast up) roads mapped around proposed site of Zarahemla (San Ignacio).

The basis for the existence of these extensive pre-Jesuit roads and the engineering techniques used in their construction are currently being explored and analyzed. This task is high on our research agenda and a major focus of our field-based investigations. These remnants of ancient highways in Baja California, extending for many miles, show evidence not only of an earlier people with experience in road building, but a necessity to build such

roads and the collective will to accomplish the task. Just as important, the construction of these roads matches the descriptions of “cast up” highways in the Book of Mormon account and are primarily located in our proposed land of Zarahemla, a major center of the Nephite culture.

Historical setting

For many years the righteous Nephites and Lamanites under Lachoneus, the chief judge and the governor over the land, were plagued by the evil and criminal activities of the Gadianton robbers and murderers and eventually were forced to gather in one location to protect their people and their flocks and herds. This seven-year standoff ended in A.D. 26 with the defeat of their Gadianton adversaries, only seven years before the resurrected Christ visited a surviving remnant of these once-righteous people. The victory brought a welcomed peace to the land of Zarahemla, as well as other lands in the land northward and the land southward:

And now it came to pass that **the people of the Nephites did all return to their own lands** in the twenty and sixth year, every man, with his family, his flocks and his herds, his horses and his cattle, and all things whatsoever did belong unto them.

And it came to pass that they had not eaten up all their provisions; therefore they did take with them all that they had not devoured, of all their grain of every kind, and their gold, and their silver, and all their precious things, and **they did return to their own lands and their possessions, both on the north and on the south, both on the land northward and on the land southward.**

And they granted unto those robbers who had entered into a covenant to keep the peace of the land, who were desirous to remain Lamanites, lands, according to their numbers, that they might have, with their labors, wherewith to subsist upon; and thus they did establish peace in all the land.

And **they began again to prosper and to wax great**; and the twenty and sixth and seventh years passed away, and **there was great order in the land**; and they had formed their laws according to equity and justice.

And now there was nothing in all the land to hinder the people from prospering continually, except they should fall into transgression.

And now it was Gidgiddoni, and the judge, Lachoneus, and those who had been appointed leaders, who had established this great peace in the land.

And it came to pass that there were many cities built anew, and there were many old cities repaired.

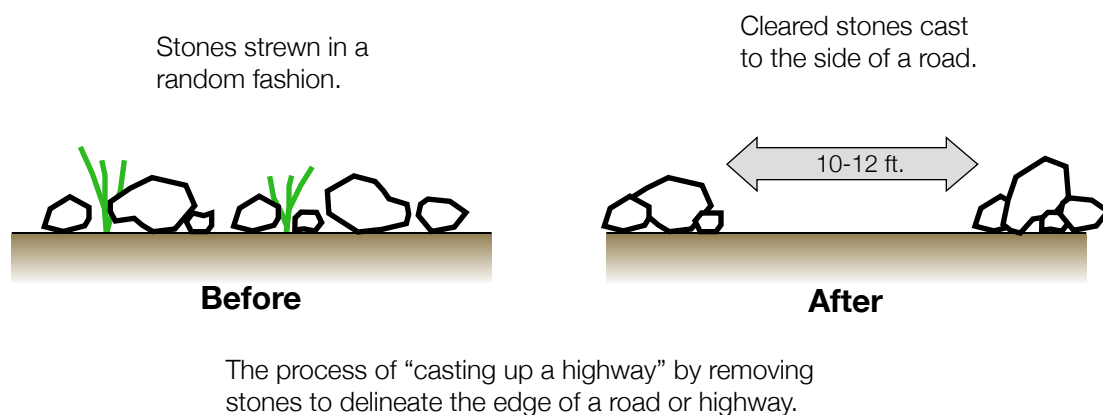
And there were many highways cast up, and many roads made, which led from city to city, and from land to land, and from place to place.

And thus passed away the twenty and eighth year, and **the people had continual peace.**
(3 Ne. 6:1-9)

This peaceful period of prosperity only lasted some four years, but as a consequence, “there was great order in the land” (3 Ne. 6:4). “Order” can imply “a fixed arrangement of things” on the land, such as the road and highway networks mentioned in this same Book of Mormon account. “Order” can also imply standards, regulations and directives imposed from a central organization or center of power. At this same time, “there were many cities built anew, and there were many old cities repaired” (3 Ne. 6:7). “Anew” in older English meant, “to renew” or to build “a second time.” All of this implies, of course, that there were cities and roads and highways on the land before this short period of peace and renewal.

Roads and “cast up” highways

A “highway” in older English refers to “a public road open to all passengers, a high road; especially a main or principal road forming the direct or ordinary route between one town or city and another, as distinguished from a local, branch, or cross road, leading to smaller places off the main road, or connecting two main roads.” Highways were situated outside of cities, towns and villages. A “road” refers to “a path or way between different places, or leading to some place. Originally: a way wide enough to allow horses, travellers on foot, or horse-drawn vehicles or the like, to pass.” These “cast up” highways and roads appear to have radiated out from the city of Zarahemla, the center of their lands, and connected with outlying settlements in the land of Zarahemla and in the lands to the north and to the south. Given even the moderate size of their lands, there could have been tens or even hundreds of miles of extensive highways which were “cast up.”



The process of “casting up” a highway consisted of clearing the ground of an existing path or trail of obstacles such as stones, rocks and vegetation and then moving the larger rocks and stones to the sides of the path to clear the way and visually demarcate a preexisting route by ridges of stones or rocks (see also, Alma 49:2; 53:4; Ether 10:23). This procedure was also used in the Biblical lands for highways and roads and by the Spanish in areas they occupied in the western hemisphere. These nuisance rocks and stones were simply “cast” or thrown to the side of the road forming a discernible border. The prophet Isaiah explains the “casting up” process in the making of highways when he states:

Go through, go through the gates; prepare ye the way of the people; **cast up, cast up the highway; gather out the stones**; lift up a standard for the people. (Isa. 62:10; see also, Isa. 57:14; Jer. 18:15)

Thus a “cast up highway,” even in the Biblical setting, was made by gathering out the stones so they could be cast to the side.

Highways leading to market centers

An account of a highway near the city of Zarahemla in 23 B.C. is recorded by Mormon:

And behold, now it came to pass that it was upon a tower, which was in the garden of Nephi [the son of Helaman], which was by **the highway which led to the chief market, which was in the city of Zarahemla**; therefore, Nephi had bowed himself upon the tower which was in his garden, which tower was also near unto the garden gate **by which led the highway**. (Helaman 7:10)

The existence of a “chief market” implies there were other markets in nearby areas. A market is where vendors convene to sell their goods and people regularly or periodically gather to buy provisions, livestock, and other agricultural commodities. A market can be in an open space or an enclosed structure. Mormon records that at this time, “there were many merchants in the land” (3 Ne. 6:11). In older English a merchant was a wholesale trader who had dealings with distant lands, such as a pedlar or a traveling salesman. Mormon later in his abridgment states the people “did traffic in all manner of traffic” (4 Ne. 1:46; see also, Ether 10:22). In older English, “to traffic” meant “the transportation of merchandise for the purpose of trade; hence, trade between distant or distinct communities; commerce.” These several Book of Mormon references imply the need for

roads and highways between lands and cities for the moving of goods for trade and commerce among numerous markets.

Networks of roads and highways

As noted above, the Book of Mormon people built networks of roads and highways connecting their “cities,” “lands” and other “places”:

And there were many highways cast up, and many roads made, which **led from city to city, and from land to land, and from place to place.** (3 Ne. 6:8)

In older English, a “city” was any “town or other inhabited place.” Many places called a “city” in the Book of Mormon and the Bible were mere villages, for example, Helam, Cumeni and Gid; and Nazareth, Nain and Bethlehem. The Nephite lands were hierarchal with smaller lands nested within somewhat larger lands that were often within still more extensive lands. For example, the land of Manti was within the political entity which was called the land of Zarahemla which surrounded the city of Zarahemla. And this political land of Zarahemla was within a much larger political entity—also called the land of Zarahemla—that stretched from the sea west (the Pacific Ocean) to the sea east (the Sea of Cortez). Lands could be identified by either natural or political boundaries. This hierarchal ordering of nested lands is not unlike the setting for the city of New York which is within the county of New York which in turn is part of the larger state of New York (see a reprint of our commentary on this topic, *“Lands” of the Book of Mormon*, at the end of this article). In accordance with the above quotation, we suggest all of the Book of Mormon cities and lands, both small and large, were connect by networks of roads and highways which led in many directions “from city to city” and “from land to land.” In about 82 B.C., Alma traveled a “three days’ journey” between the land of Melek and the land of Ammonihah to the north, a distance of some 40 to 60 miles within the larger land of Zarahemla (Alma 8:4-9). The roads connecting the major lands of Desolation, Bountiful, Zarahemla and Nephi would have extended for distances measured in hundreds of miles.

This same reference (3 Ne. 6:8) states that highways and roads also led “from place to place.” The phrase, “from place to place” occurs elsewhere in the Book of Mormon text (see, Alma 20:33; 62:36; Hel. 4:16; Morm. 8:7) and is an older English phrase meaning “from one place to another, and on to yet other places,” like a network of roads. A “place” is a rather common term with several meanings. In general it refers to “a particular spot or area inhabited or frequented by people; a city, a town, a village.” In older English a “place”

also referred to “an open space in a town, a public square, a marketplace” or to “a battlefield” or a “fortified city” or “a piece or plot of land; a holding” or “a place of resort or bathing places” or “a dwelling place” in the country such as a farm or farmstead. All of these meanings can be related to comparable spots, areas or locations mentioned in the Book of Mormon text, and we would suggest that roads and highways were constructed “from place to place” to connect these significant locales within the Nephite lands.

Mormon records that in A.D. 200 “the people had multiplied, insomuch that they were spread upon all the face of the land” (4 Ne. 1:23). Moreover, we should expect to find on the land today a network of ancient roads and highways connecting such locations.

Conveyance of goods and the width of roads and highways

Mormon records that in about 90 B.C., Ammon, one of the missionary sons of Mosiah, prepared the “**horses and chariots**” of king Lamoni to “conduct him forth to the land of Nephi; for there had been a great feast appointed at the land of Nephi, by the father of Lamoni, who was king over all the land” (Alma 18:9-10, 12; see also, Alma 20:6; 2 Ne. 12:7; 3 Ne. 21:14). In older English, “chariots” were any wheeled vehicles for the conveyance of goods or people, such as a cart or wagon, and not simply vehicles for warfare. Mormon later noted the use of chariots as a means of transportation:

And it came to pass in the seventeenth year [A.D. 17], in the latter end of the year, the proclamation of Lachoneus had gone forth throughout all the face of the land, and **they had taken their horses, and their chariots**, and their cattle, and all their flocks, and their herds, and their grain, and all their substance, and did march forth by thousands and by tens of thousands, until they had all gone forth to the place which had been appointed that they should gather themselves together, to defend themselves against their enemies. (3 Ne. 3:22)

Jarom, the son of Enos, recorded that his people “became exceedingly rich in gold, and in silver, and in precious things, and in fine workmanship of wood, in buildings, and in **machinery**, and also in iron and copper, and brass and steel, making all manner of tools of every kind to till the ground” (Jarom 1:8). Machinery in older English referred to contrivances or structures of any kind created skillfully and inventively to serve a particular purpose, including a vehicle or conveyance (usually wheeled), especially one drawn by a horse or horses, or other draft animals.

Mormon describes a journey with his father in about A.D. 322, when he was very young. This journey took place at the beginning of the lengthy 63-year final war between the Nephites and the Lamanites:

And it came to pass that I, being eleven years old, **was carried by my father into the land southward**, even to the land of Zarahemla. (Morm. 1:6)

In older English, “to carry” meant “to convey, originally by cart or wagon, hence in any vehicle, by ship, on horseback, etc.” This was a multiple-day military journey from the land northward to the land of Zarahemla, and obviously Mormon was not “carried” this distance in his father’s arms (see Morm. 1:10).

To accommodate these commonplace, wheeled vehicles, we suggest the “roads” and “cast up highways” of the Nephites would have been some 10 to 12 feet wide. Walking roads for people and animals could have been only three to five feet wide.

Destruction of roads and highways at the time of Christ’s crucifixion

Mormon records that in A.D. 34, at the time of Christ’s crucifixion, the Nephite highways and roads were affected by the accompanying destruction on the land:

And there was a great and terrible destruction in the land southward.

But behold, there was a more great and terrible destruction in the land northward; for behold, the whole face of the land was changed, because of the tempest and the whirlwinds, and the thunderings and the lightnings, and **the exceedingly great quaking of the whole earth**;

And **the highways were broken up, and the level roads were spoiled**, and many smooth places became rough. (3 Ne. 8:11-13)

This destruction of highways and roads was prophesied by Samuel some 40 years earlier:

And **many highways shall be broken up**, and many cities shall become desolate. (Hel. 14:24)

In older English, “broken up” meant the surface of the roads and highways would be “intersected with ravines or valleys; uneven.” Similarly, in older English, “to spoil” meant “to bring to an end” or “to render unfit or useless.” Moreover, the Lord declared at the time of destruction that the city of Zarahemla was “burned with fire” (3 Ne. 9:3). Mormon later in his abridgment states:

And the Lord did prosper them exceedingly in the land; yea, insomuch that **they did build cities again** where there had been cities burned.

Yea, even **that great city Zarahemla did they cause to be built again.** (4 Ne. 1:7-8)

We suggest that since the “burned” cities were required to be rebuilt, the roads and highways that were “spoiled” and “broken up” at that same time would also have been repaired or rebuilt out of necessity.

Investigating Roads and Highways from Satellite Imagery and Ground Surveys

(The term road includes both roads and highways)

Width

- What is the nominal width of any given road (the distance between the cast up rocks)?
- What are the variations in width along stretches of road and from road to road?
- What are the possible reasons for these width variations, such as the engineering challenges of changing terrain or gradient?

Length

- What is the length of each road from where it begins to where it ends abruptly or terminates by merging into another road?

Straightness

- What is the length of each straight stretch of road before it veers in another direction?
- Are there stretches of straight roads that maintain their straightness with some effort in spite of gradient or terrain changes that could justify a more circuitous route, say around a small hill or a depression such as an arroyo? In other words, someone would have commanded: “Thou shalt make it straight at all costs.”
- Do straight roads that undeviatingly extend over hills or through depressions in the terrain continue their straight course along the same axis on the other side by seemingly purposeful design? Could the road builders determine the continuing straightness of these roads along the same axis by line of sight or would the next straight segment have had to be determined by more sophisticated non-line of sight surveying techniques?

Road Surfaces

- Do the road surfaces consist of the same soil and small rock material found in the immediate vicinity, or does it appear that the surface material was transported from another location?
- When viewed on satellite imagery, road surfaces are often a lighter shade of brown than the coloring of the surrounding terrain? Could the lighter color come from special surfacing by the builders or from heavy use and tramping down of the surface layer over time?
- Are there obvious ruts from wagons (carriages) or other vehicles, or even from humans and animals?
- If parallel ruts are visible, what are the nominal widths of the ruts?
- Do any road surfaces show possible signs of destruction dating from the devastation at the time of Christ's resurrection? At that time "the highways were broken up, and the level roads were spoiled." This destruction was caused by "the exceedingly great quaking of the whole earth." Even though it appears that many of these roads were rebuilt, there still could be evidence that some were not, or that some roads still show misalignments and off-setting deviations from their original straight course as a result of the quaking of the earth.

Construction of Roads

- Is there any evidence as to how roads were actually constructed, such as the using of tools, the hauling and placing of rocks, the preparing of road surfaces, and the employment of measuring and surveying devices?
- At infrequent points along some roads, and within some 15 to 30 feet of the road, we have seen small walls, one to two feet tall, and also small rock piles. Are similar walls and rock piles found along other roads, and do they appear to be associated with road construction? Are there other features near roads that could be remnants of construction or associated with the actual use of the road?

Nodes

- A node is a point at which two or more roads intersect or branch; a central or connecting point. What is the environmental setting of each of the nodes? Are the nodes in flat areas or do some nodes occur in areas with gradients or even on hill slopes? Are there obvious reasons for the existence and location of any given node, or do some nodes appear to be in the middle of nowhere?
- Do most roads cross at right angles? What is the variation and range of crossing angles?
- Where two roads cross or come together, do they merge sharply or do they merge through gradual curves?
- Where more than two roads merge at a node, are there possible explanations for multiple roads at that location?

Parallel Roads

- Parallel roads, extending side by side for some distance, can be seen on satellite imagery. Are there obvious reasons why these parallel roads exist in these locations?
- Where there are two parallel roads, does one road appear to be older than the other, or does one road appear to be old and the other of more recent construction, say within the last 300 years?
- Where two parallel roads exist, are there situations where the roads are different widths? If they have ruts, are the ruts of different widths? Are there variations in surface materials or even different cast up rock sizes and cast up configurations?
- Where three or more roads exist in parallel, are there possible explanations for this alignment at that location?

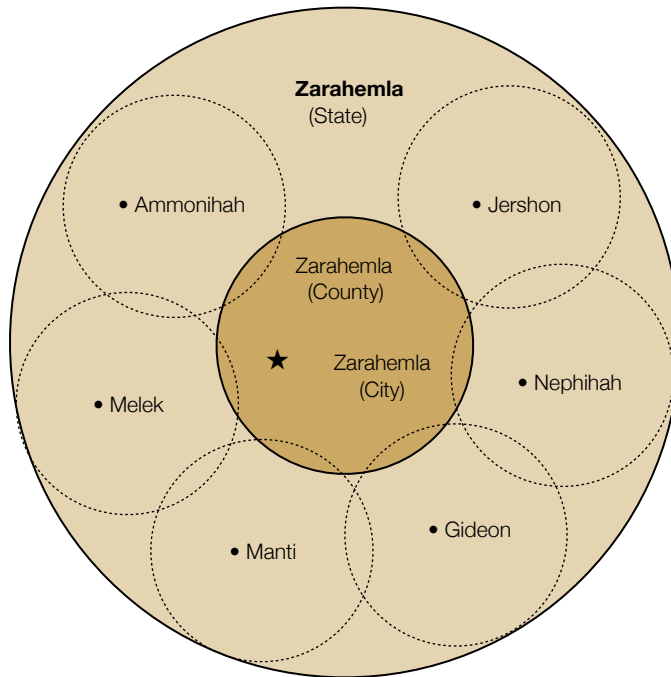
Destinations of Roads

- Is there an obvious destination or terminus for any given road, such as a city or village, a seacoast, a spring of water, a river, a battle location, or a prominent hill or valley?

- Do some roads appear to be primary roads while others appear to be secondary? Is this hierarchy of purpose evident by width, level of engineering and construction or by the way it merges with or crosses other roads?
- Do some roads appear to have no destination in particular, that is, they terminate abruptly? Could such roads have serviced locations of religious or cultural significance that are not obvious to us today? Such locations may not have had any structures of consequence built on them at the time the road was used. Their purpose, therefore, may not be obvious to us today.

“Lands” of the Book of Mormon

Within the eight major Book of Mormon lands there were nestled smaller lands. For example, the land of Zarahemla included the land of Manti and the smaller lands of Gideon, Jershon, Noah and several others. Also within most of these lands there was a city with the same name, such as the city of Zarahemla within the land of Zarahemla. Then to add to the complexity, the record states that one of these lands, the land of Zarahemla,



Lands of the Book of Mormon

There are three levels of land sizes, often with similar names, not unlike the relationship between states, counties and cities today.

in its largest configuration, “was nearly surrounded by water” (Alma 22:32). These overlapping and nested places can be confusing to readers of the Book of Mormon. We find it helpful to compare these graduated lands and cities to the relationships between the city, county and state of New York or the city and county of Salt Lake and the larger state of Utah. Thus the city of Zarahemla was surrounded by a land of Zarahemla (like a county) and a still larger land of Zarahemla (like a state) which extended to the sea east and sea west. Within this larger land of Zarahemla there were numerous smaller lands (like counties), many with a city of the same name. These smaller lands were not too wide, about the distance of a day’s journey—some 10 to 15 miles—similar to the size and spacing of counties in the early settlement of North America, and for the same reason: to

accommodate a civil spatial organization based on the limited range of slow modes of travel. At times, the Lamanites occupied sea coast locations on the west and east of the larger land of Zarahemla, leaving the smaller interior area centered on the city of Zarahemla to Nephite settlement (Alma 22:28–29). Most often, the Book of Mormon text is referring to this smaller interior area when it says, “the land of Zarahemla.” This scaled and nested naming of lands holds true for other major Book of Mormon lands. There are two lands of Bountiful mentioned in Alma 27:22, where it states, “the land of Jershon, which is on the east by the sea, which joins the land Bountiful, which is on the south of the land Bountiful.” The larger land of Bountiful—the last named—extended “even from the east unto the west sea,” with a smaller land of Bountiful within its borders (Alma 22:33). Between adjoining Book of Mormon lands there were stretches of territory of some width, called “borders.”

Borders

Phrases such as “borders of the wilderness,” “borders of the seashore,” “borders of Zarahemla” or “borders of Manti” are common in the Book of Mormon text, especially when describing lands adjoining the river Sidon (Alma 16:7; 22:27; Morm. 1:10). The word border is not found in the Book of Mormon record. The word always appears with an “s” as borders. Borders is not the plural of border, but has its own meaning. In older English, the term borders denotes a district, territory or frontier of some width between two land areas. These named tracts of land often indicate imprecise border regions and are sometimes called marches. The term borders can apply to a stretch of territory along a coastal area. This older definition of borders is helpful in understanding the geography of the Book of Mormon where phrases such as the “borders of Manti” do not refer to line borders, nor multiple line borders, but to land of some width. A border can be a line if a line is mentioned, such as when describing the defense “line which was between the land Bountiful and the land Desolation” (3 Ne. 3:23). This was the defense “line which they had fortified and stationed their armies to defend their north country” (Hel. 4:7; see also, Alma 22:32; 50:11, 13).

Inventory and Plausibility of Identification of Book of Mormon Structures

To declare an ancient building a Nephite structure, the remains of that building would need to match some identifying features that are recorded in the Book of Mormon text. The following chart is a complete inventory of all the structures in the Book of Mormon record and their associated features. The chart is grouped by location of the structure with notations on dimensions, building materials, relative size and the plausibility of finding and identifying the structure today, some 1600 years after the end of the Book of Mormon record.

In an attempt to calculate the plausibility of identifying a structure today, many years after it was built, we have assigned a weighted score to each structure. Structures made of stone (10) or dirt (8) are weighted the highest on the plausible scale. Objects made with wood (2), cement (4) and metal (6) would most likely have deteriorated over time, thus the lower scores. Items that are stated in the Book of Mormon (●) are given their full score, whereas materials that are only implied (○) are given half their score.

We have classified the size of each structure based on its probable dimensions. If the structure is measured in miles we have marked it as large (■■■), if the structure is measured in yards we have marked it as medium (■■) and if a structure is measured in feet is marked as small (■). Each size is then assigned a relative score of 8, 5 and 2 respectively, with the assumption larger structures would be more likely found on the landscape today.

The plausibility scores from the materials and relative sizes are then added together to provide a total plausibility score that can be used to estimate the most identifiable structures that could remain after more than 1600 years. Structures with similar total plausibility scores are then grouped together. Structures that score more than 20 should be the most probable to find and are highlighted in orange. Structures that scored between 10 and 20 may be possible to find and are highlighted in light orange. The other structures probably are not identifiable today because of the deterioration of the materials used and their smaller relative size and lack of distinguishing features.

Structure	Dimensions			Materials					Size	Total Plausibility Score
	Width	Height	Length	Stone	Dirt	Wood	Cement	Metal		
Score				10	8	2	4	6	8, 5, 2	
Land of Nephi										
City of Nephi Walls				○ 5					■ 8	13
Nephi's Temple	○	○	○			● 2		● 6	■ 2	10
City of Nephi Prison				○ 5		○ 1			■ 2	8
City of Middoni Prison				○ 5		○ 1			■ 2	8
Noah's Palace						● 2			■ 2	4
Nephi's Temple Tower		○				○ 1			■ 2	3
Hill Shilom Tower		○				○ 1			■ 2	3
Land of Zarahemla										
City Walls		○		○ 5					■ 8	13
Prison				○ 5		○ 1			■ 2	8
Nephi's Garden					○ 4				■ 2	6
Judgement Seat						○ 1			■ 2	3
Temples						○ 1			■ 2	3
Temple Walls	○	○	○			○ 1			■ 2	3
King Benjamin's Tower		○				○ 1			■ 2	3
Nephi's Tower		○				○ 1			■ 2	3
Gates						○ 1			■ 2	3
Land of Bountiful										
Ditches			○		● 8				■ 5	13
Temple						○ 1			■ 2	3
All Lands										
Walls		○		● 10	● 8	● 2			■ 8	28
Roads	○	○	○	● 10	● 8				■ 8	26
Ditches			○		● 8				■ 5	13
Homes						● 2	● 4		■ 2	8
Prisons				○ 5		○ 1			■ 2	8
Buildings							● 4		■ 2	6
Synagogues		○				○ 1			■ 2	3
Temples						○ 1			■ 2	3
Towers		○				○ 1			■ 2	3

Note that walls (28), roads (26) and ditches (13), all made with durable materials, placed the highest on the scale, indicating that these features have the highest probability of being identified today. Thus the best one could hope for is to identify roads, ditches and stone walls. And, not unexpectedly, remnants of ancient walls, roads and ditch lines can be identified in Baja California, especially in the areas we propose as Book of Mormon lands, such as the land of Zarahemla.