

# The Use of Mounds to Improve Community Environments on the Anangu Pitjantjatjara Yankunytjatjara Lands

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April 2002

## **Introduction:**

The Anangu Pitjantjatjara Yankunytjatjara Lands occupy the north-west corner of South Australia which forms part of the Australian arid zone. The rainfall is low (125- 200 mm per annum) and conditions are usually dry and dusty. As communities were established across the Lands, local environments degraded, creating the need for environmental improvement programs. In the early 1970's, these programs gathered momentum, when Pitjantjatjara and Yankunytjatjara communities and homelands became incorporated. In this period, housing societies were formed and housing programs began in earnest. Pitjantjatjaras and Yankunytjatjaras (Anangu) began to plan where and how to build their new houses in relation to existing water and electricity supplies. Town plans were developed along with the opportunity to begin long-term programs to improve the environment.

As Anangu houses were built across the Lands, the demand by homeowners for shade trees, fruit trees and "pretty" flowers increased rapidly. A plant nursery was established at Ernabella and produced plants of local species from seed collected across the Lands. Plants from many other sources were collected by Anangu and began to appear in their gardens. A range of planting programs was developed and practised in and around communities, resulting in valuable experience for Anangu and their advisors.

As programs progressed and earth-moving machinery became available, some mound (tuunpara) building ideas were introduced. This was during the 1980's and these mounds were designed to provide an undulating surface on which trees and shrubs were grown. It wasn't until the early 1990's that mounds were designed for people usage as well as for tree planting. This new innovation involved the construction of two amphitheatres at Umuwa on the Anangu Pitjantjatjara Yankunytjatjara Lands. The project used many cubic meters of soil and provided a venue for people to sit, talk and have meetings. This type of mound building required the use of large tip trucks and a loader, which were not readily available in most communities.

## **The Concept of Mound Building:**

During the 1990's, the concept of mound building was pursued by a number of people working with environmental and health issues. Mound building was seen as an opportunity to create outside living areas around houses, thus providing a better lifestyle and relieving overcrowding problems within the house.

The concept of mound building involves changing an uninspiring piece of land into something, which becomes attractive because of its shape and elevation. The land in communities is usually open and flat, rather than a collection of microenvironments, which can provide a range of venues for Anangu to use. In the past, tree planting programs have been used to provide these microenvironments, however they are slow to establish. The construction of mound systems is a relatively quick operation, resulting in a range of microenvironments across a community for people use as well as to grow trees and shrubs.

### **A New Mound Building Program:**

In the early 1990's, the "Housing for Health" program began at Pipalyatjara on the Anangu Pitjantjatjara Lands. This program has been very extensive and includes the importance of the house yard as an integral part of the living area for Anangu. An essential part of the work was the gathering of climatic and airborne dust data as well as house use data. The information has contributed to the improvement of operating systems and hardware usage in and around houses.

In August 2000, Stephan Rainow the Environmental Health Officer from the Nganampa Health Council invited me to visit Pipalyatjara with himself and Paul Pholeros to begin developing ideas for mound systems, which could be used to control traffic movement on median strips within the community. The road system had been sealed with bitumen earlier in the same year and the community was hoping to develop a new type of community landscape to manage the movement of off-road traffic. Previous to this, roads were open spaces, which were less defined and usually included the median strip. The sealed road system was now well defined, however the angled concrete gutters allowed vehicles easy access to the median strips between houses and roads. Although the new road system had greatly reduced the local dust problem, vehicle movement on open median strips produced dust, which freely flowed over people sitting around houses.

The construction of mounds along the median strips was seen as an easy solution, which would control the movement of traffic. These areas were also used by people including children, as walkways between houses and the clinic or store. The effectiveness of these mounds depended on them being radically different to anything previously built on the Lands. Their shape and size would have to be something which people could use and enjoy.

### **Mound Construction:**

In October 2000, Stephan and I returned to Pipalyatjara to begin Stage I of what was to be an exciting concept in mound building. The width of the median strip varied between 12 and 18 meters and the plan was to build five mound systems, which varied between 40 and 60 meters in length. The Anangu Pitjantjatjara roads crew had been contracted to deliver the soil for the mounds from a site, which had been previously determined and was six kilometres from the community. The soil chosen for the construction of these mounds was a clay loam, which would compact well and produce little or no dust

problem within the community. Two tip trucks (10 meter capacity) and a front-end loader were used to load and deliver approximately 130 loads (1,300 meters) of soil over a five day period.

Mound building was a new experience for those living at Pipalyatjara and there were plenty of willing hands to help build them. It was great to have the school children involved at different times of the day during the construction process. A crescent shaped line was drawn on the ground as the centre line of the first mound and the men were quick to demonstrate their ability at directing the trucks to tip the loads of soil along the line. This was how the overall shape of each mound was determined. The loads were tipped very close together so the cross section of the primary mound would spread across a base of about five meters. The secret was to build the mounds about a meter high, so when they settled, they would still be about 800 to 900 mm high. Everybody was amazed at the size of the mounds as they raked and shovelled the soft soil into a range of different shapes. As the work progressed, several half loads of soil were spread out on the inner side of the mound. This soil was shaped with the bobcat and raked out to provide a lower floor level inside the mound where groups of people could sit, talk and eat food. The top of each mound was flattened off to provide a higher sitting area which had a view around the community. After the first mound was shaped and compacted using the treading action of many feet, a drum oven was placed inside the mound and used to cook the evening meal for the workers.

In principle, each mound system contained a primary mound, which sloped to the road on the outside. The inside was shaped into one or a number of smaller internal crescents, each of which encircled a floor area that gently sloped away toward the front fence of each house. These areas varied in size and acted as sleeping, sitting, cooking and eating areas.

During stage I, it was possible to build an amphitheatre outside the community office on a rocky outcrop of land. The request for this very large mound came from a community member when stage I of the mound building program was being planned. Amphitheatres need to be specially shaped to accommodate community meetings. Generally they are crescent or horseshoe-shaped and encircle a shallow floor to maximise the sitting area for community members. The top needs to be as wide as possible (several metres), providing more sitting space and the opportunity for avoidance practices to be observed during meetings. Amphitheatres are a specialised form of mound system and provide an excellent opportunity for communication within the community. About 500 cubic meters of soil was used to construct the amphitheatre at Pipalyatjara because the land on which it was built required extra fill. A smaller volume of soil was used at Kalka where the amphitheatre was built on flat ground.

The mound building program was extended to include the Kalka community who had become quite stimulated by what they saw at Pipalyatjara. Hence a range of new designs and shapes emerged to meet the particular needs of that community. There were already a number of shelters outside house yards, which served as outside living areas. At the request of the community, the mounds built around these shelters were low. Women sitting inside wanted to keep a watchful eye on children who may be playing some distance away. These mounds were built with 8-10 truck loads of soil (80 to 100 meters).

During successive stages of the program, mound systems were also developed for house yards to create extra living areas to reduce overcrowding in houses. These systems usually consisted of an outer primary mound, which encircled and flowed into a series of inner secondary mounds. Generally twelve to sixteen loads of soil (120 to 160 meters) were used to build these mound systems. The front fences were removed and the mound system integrated with the front veranda and any existing trees in the front yard. The area required for these systems was approximately seventeen meters deep by thirty meters wide. A new panel style fence was developed, which was easily attached to round poles making it possible to erect a curved fence around the outside of the primary mound.

When the mound is shaped, the soil is soft and should be compacted using the treading action of feet or the wheels of a tractor. The mounds should be irrigated with water, which assists the soil to settle and produces a firm surface during the drying process. Steep sides on mounds should be raked out to an angle of about 45° to 50°. After the mounds have been shaped and raked, a piece of mesh (50 mm squares) with ropes attached can be dragged over the mound surface producing a rounded finish.

**Note:** Never be sparing with soil when building mounds. They settle over time and it is better to use too much soil than too little. Building mounds is a creative exercise and the builder can make any shape he or she desires.

### **Mound Shapes:**

During the mound building program at Pipalyatjara and Kalka, a variety of shapes and sizes were built. Sixteen mounds were built at Pipalyatjara and thirteen at Kalka. More mounds have been built since as part of community work programs. Once the concept was embraced at the community level, everybody realized that mounds were very easy to build. As the programs progressed in each community, it was exciting to see community members drawing pictures on the ground and explaining how they wanted to build mounds around their houses and in their community.

The material used to construct mounds was soil and everybody could see that it was easy to rake and shovel into any shape that the mound builder desired. Generally mound systems consisted of an outer primary mound, however its shape was subject to its designer. Unwanted soil in one part of the mound could be easily shifted to another part with the bucket on a small tractor. Some people wanted elevated areas within their mounds, while others wanted low areas surrounded by walls of soil for privacy. Others wanted low open mounds, which were also easy to produce. What amazed everybody was that they could produce any shape they wanted and if they were not happy with the result, it could easily be changed.

Large volumes of soil were required for the mound building program and care was exercised at all times when tipping soil around houses and buildings. The position of overhead power lines had to be observed and care taken when tipping soil near them.

The diagrams at the end of the article will help those planning to build mounds for the first time.

## **Applications for Mounds in the Community Environment:**

The original application of mounds at Pipalyatjara was to reduce the production of dust and increase safety for people by restricting vehicle movement on one of the median strips between the houses and the bitumen road system. As stage I of the program progressed, it was obvious to see other uses for mounds emerging. Stage I was a big project, resulting in approximately 250 linear meters of mounds being constructed along the median strip outside a block of five houses. Five mound systems were built over a five day period and during this time, people began using them to sit on at the end of the day and engage in conversation with people as they walked past on their way home. The success of stage I, stimulated everybody to extend the program at Pipalyatjara as well as begin a new program at Kalka. These two communities have a high level of contact with each other through the shared facilities of a school, clinic and other services. The mound building program at Pipalyatjara involved members of both communities, hence the request to begin a program at Kalka.

Mounds have provided the following uses.

**1. Mounds in Front Yards:** In the early 1990's, a single crescent shaped mound was built adjacent to the front veranda in a house yard at Umuwa. It was used for entertaining during the evening as well as for sleeping on overnight. The mound development work at Umuwa, helped provide the stimulus required to build mounds in house yards at Pipalyatjara. The Umuwa experience demonstrated the need for a loader and a number of big trucks to deliver the many cubic meters of soil required to build mounds.

Stage II of the program at Pipalyatjara, included building a mound system in the front yard of a house. The front fence was removed so the front yard and part of the median strip could be used for the new development. Since there was no limit on the amount of soil available, there was no restriction on the size and shape. There were two mature peppercorn trees in the median strip so they were encircled by the crescent shaped primary mound, which joined into the front veranda. The inside of this primary mound gently sloped into a number a smaller secondary mounds which were formed to create separate areas in which people could cook food or sit and talk. The completed mound system flowed out from the front veranda and was very user friendly. A circular fence was erected around the new system providing some security for those camping within the mounds.

While visiting the community on other occasions, it was obvious that people were sleeping and cooking in the mounds built in the front yard, thus relieving the pressure on the facilities provided in the house. The mound system also provided a venue for women to sit together during the day while doing their craft work.

**2. Mounds to Relieve Crowding:** Anangu have enjoyed the values of living in extended family systems for many generations. When housing programs began in earnest in the 1970's, it was very difficult to accommodate the extended family in a standard three bedroom house. As programs advanced, verandas were added thus increasing the living area available to the family. Some houses became very crowded and the facilities were over taxed. Crowding also resulted in the rapid spread of sickness throughout the

family. Mounds have added more venues to the house by providing outside living areas. These additions have reduced the number of people in the house for varying periods during the day. This in turn results in a healthier environment, which benefits everybody. Mounds encourage people to socialise in an outside environment as an alternative to meeting in the house. Hopefully these outside venues will provide a long term solution as they satisfy the lifestyle to which Anangu are accustomed.

**3. Mounds for Median Strips:** These mounds have been discussed earlier and were the original reason for beginning the mound building program. Other styles of mounds were built on median strips in other parts of the community and provided places for people to sit and talk which is customary for Anangu. The mounds successfully filled the spaces on the median strips that were once used by vehicles. Drivers are now restricted to the road system and the allocated off-road areas.

**4. Mounds for Open Areas:** The open compacted areas in communities are often large and unused. Some become eroded as storm water collects and channels its way across them before entering the road system. In some of these open areas, mature trees already exist and if this is the case, they provide good opportunities to build mound systems around them. This was done at Pipalyatjara when some of the work crew decided it would be a good idea. Some of the young men directed the trucks to tip soil around several mature trees from which a continuous mound was shaped. This mound provided a place for people to sit as well as control vehicle movement and aid the collection of storm water. It's not difficult to arrange the mound system to collect this water to irrigate trees and reduce run-off.

**5. Mounds to Collect Storm Water:** As the mound building program progressed at Pipalyatjara and Kalka, it was becoming obvious that mounds could be used for other purposes. In March 2001, the storm water program at Kalka was constructed and the mound building program initiated. This included building a mound system around three sides of the community office. The roof area of the office was quite large and shed large volumes of storm water which flowed across the open compacted area into the road system. There were no gutters on the roof to collect the water and store in rainwater tanks. The mound system which encircled the lower side of the office block, absorbed all the storm water collected by the roof during a six month period. Storm water no longer escaped into the road system causing local flooding and road damage.

When mound systems are being built in communities, they should always be designed to collect storm water wherever possible as well as fulfilling other functions.

**6. Mounds for Outside Living Areas:** As mentioned earlier, small outside shelters have been built around Kalka, usually outside the house yard. These were built to provide shade and an outside cooking area for Anangu, thus decreasing the pressure on the facilities in houses. Anangu saw an opportunity to enhance these shelters by building mound systems around them. The mounds added definition to the living area making it easier for people to keep clean. In some cases low mounds were built so women could see children who may be playing some distance away.

**7. Mounds for Meetings – Amphitheatres:** After building this type of mound system, it was hard to imagine how the two communities mentioned above could have done without them. They are very functional and it would be easy to erect a piece of sail material over them, thus providing shade during the hot summer months. Every community could use an amphitheatre as a place for holding public meetings.

Amphitheatres also provide a venue for Anangu to meet casually during the day and discuss events of significance. Because these mounds are built in relationship to the office, people are able to follow up their discussions immediately by making a phone call or talking to the relevant advisor. Amphitheatres are therefore significant in promoting a stronger involvement of community members in community management.

**8. Mounds for Communication:** Mounds were also found to stimulate and enhance non-verbal communication. Hand signs are used extensively in communities and it's necessary for Anangu to see each other before communication can take place. Mounds provided an elevated location on which Anangu could sit or stand and communicate with each other while some distance apart. Communication also became more effective between those sitting on mounds and those travelling in motor vehicles.

Mounds in house yards have also increased the general level of verbal communication within the community. When people are visiting, it is often confronting to both parties when the visitors and the occupants of a house meet at the front door. If people are sitting outside in their mounds cooking food etc., it is much easier for those passing by to exchange greetings and news. It's also easier and less offensive for those sitting on mounds to tell others to visit later. Those passing by may only want clarification about a simple matter. This could be easily given by a family member without unnecessary interruption to those sitting around the mound.

**9. Mounds for Revegetation:** Often there are extensive open areas around communities which produce little or no vegetation after rain. These areas are usually compacted and provide little opportunity for windblown seed to collect on the surface. Natural revegetation of these areas becomes viable when the nature of the soil surface is changed allowing seed to collect and germinate. Once this has been achieved and it is left undisturbed, the process of revegetation begins. Machinery can be used to make staggered furrows or ponding banks on the open areas, thus providing niches for seed collection. If the appropriate machinery is not available a series of low mounds can be built on open areas into which seed can be directly sown or collect naturally. The soil used for building the mounds may also contain native seed, which usually germinate after being disturbed during the mound building process. Every effort should be made to reduce the size of open areas around communities by revegetating them, thus reducing the amount of airborne dust in the local environment. When this occurs, people are relieved from general discomfort, transmission of infection and irritation caused by dust.

### **The Value of Mounds:**

The overall environment at Pipalyatjara and Kalka has greatly improved since the introduction of mounds. Their value cannot be stressed enough and they obviously have a place in each community across the Lands.

Mounds have:

- Enhanced the community landscape and enhanced the level of community wellbeing.
- Reduced the movement of traffic and increased safety for pedestrians on median strips.
- Eliminated dust produced from vehicle movement on median strips.
- Increased the opportunity for Anangu to communicate within the community.
- Reduced the pressure on facilities provided in houses.
- Reduced crowding in houses and the transmission of infection.
- Defined areas within the community, thus assisting “tidy town” programs.
- Contributed to storm water management programs within communities.
- Provided appropriate areas for craft workers and others to meet while engaged in their activities.

### **Reflections:**

The mound building work at Pipalyatjara and Kalka has transformed the landscape in both communities. Everybody became involved in the program, which made it possible to develop the concept well beyond that established in the 1990’s. The wellbeing of the community members has improved significantly and every effort should be made to sustain these improvements.

The timing of the program produced some interesting long term benefits. Instead of completing the work in one operation, it was done in a number of stages over a fifteen month period. This allowed each stage to be assessed before progressing to the next. The results of each stage plus feedback from community members provided the stimulus to develop extra mound shapes to suit a range of applications. Hence many people gained valuable experience in mound building on a very large scale. Even the Anangu Pitjantjatjara Roads crew experienced the dynamics of building mounds throughout both communities.

This was a very popular program, which has application in most communities. Hopefully the results achieved at Pipalyatjara and Kalka can be built upon and applied in other communities across the Anangu Pitjantjatjara Yankunytjatjara Lands.



## **Acknowledgements:**

Many years ago, mound building was considered a useful concept to introduce as a method of improving arid zone environments on the Anangu Pitjantjatjara Lands. A number of people have been involved in developing the concept through various stages resulting in the present applications. These people are acknowledged and include Simon Thompson, Gary Lord, Owen Martin, Stephan Rainow, Paul Pholeros and many others.

Pitjantjatjara and Yankunytjatjara people living in communities across the Lands are acknowledged for their help and encouragement during the various stages of mound development.

Stephan Rainow of the Nganampa Health Council and David Lewis from the Christian Blind Mission have made the most recent work at Pipalyatjara and Kalka possible. Without their foresight and the ability to provide finance, mound building and its contribution to dust control and community wellbeing, would be many stages behind where it is today.

The publication “Housing for Health” by Paul Pholeros, Stephan Rainow and Paul Torzillo is also acknowledged for its contribution in encouraging the development of outside living areas in house yards.

# Some Mound Profiles Developed During the Program

M.W. Last  
May 02

## 1. High Mounds

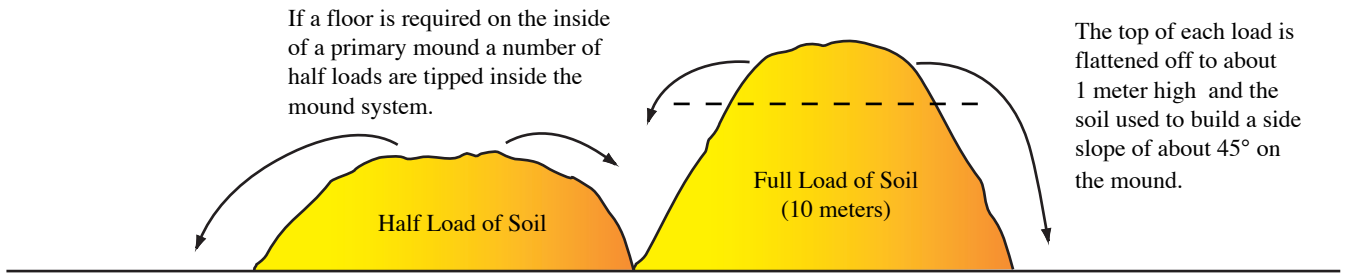


Figure 1: Before Shaping the Mound System

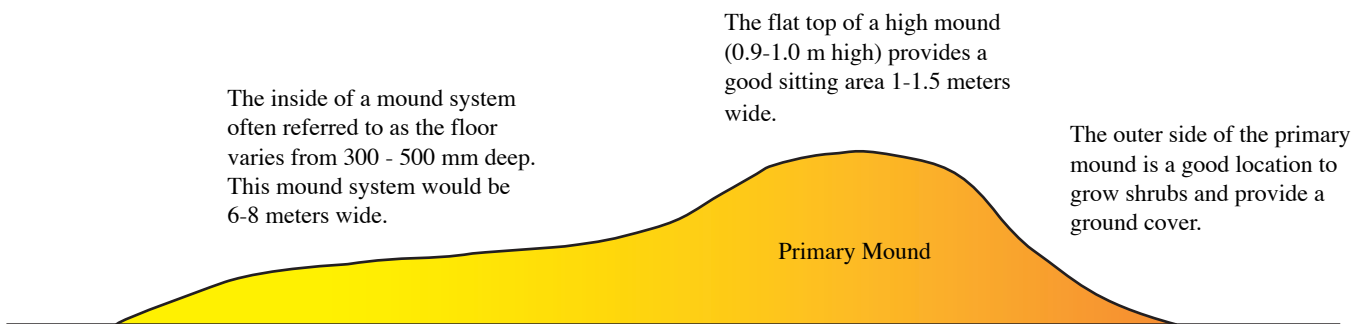


Figure 2: After Shaping the Mound System

## 2. Low Mounds

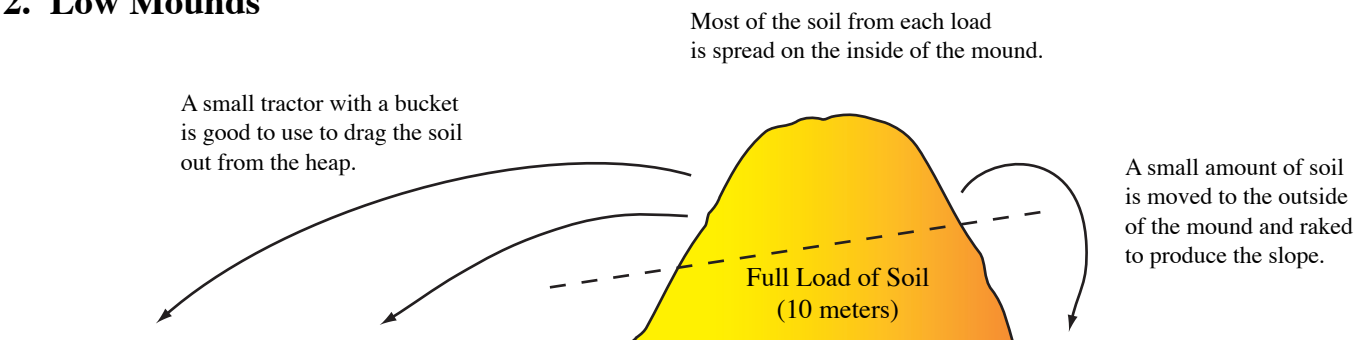


Figure 1: Before Shaping the Mound System



Figure 2: After Shaping the Mound System

# Some Mound Profiles Developed During the Program

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## 3. Amphitheatres

If possible a wide top (1-2 meters) is formed at the top of the Amphitheatre and a gradual slope produced on the inside for ease of sitting during meetings.

The top of each load is flattened off at 1 meter high and the soil used to build a side slope of about 45° on the mound. Extra soil may be required on the outside slope.

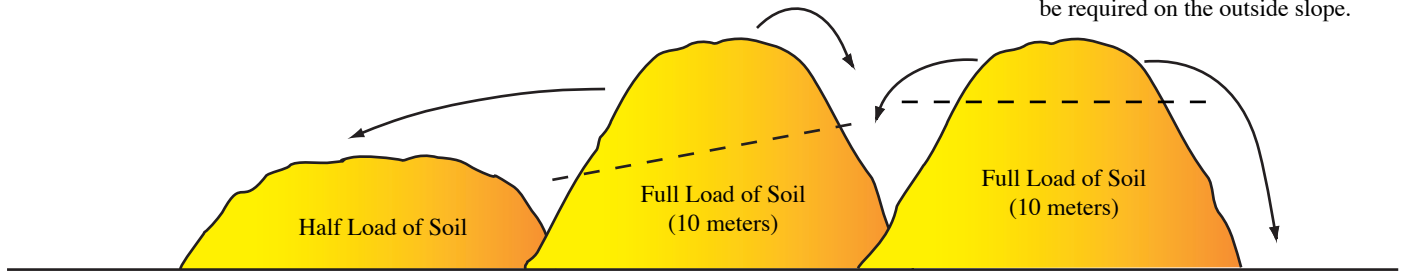


Figure 1: Before Shaping the Mound System

A small tractor with a bucket is good for dragging the soil from the heap to make the gradual slope inside the Amphitheatre. The width could be as much as 10-12 meters.

The flat top of a high mound (0.9-1.4 m high) provides a good sitting area 1-2 meters wide.

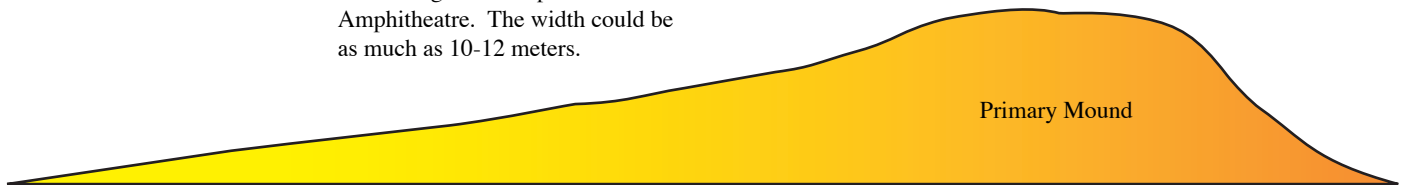


Figure 2: After Shaping the Mound System

## 4. Mound Combinations

Half loads are tipped on the inside of the primary mound from which secondary mounds are shaped and blended into the primary mound.

The top of the full load is dragged down to provide a gentle slope on the inside of the mound.

Soil from the top of the heap is used to build a side slope of about 45° on the mound.

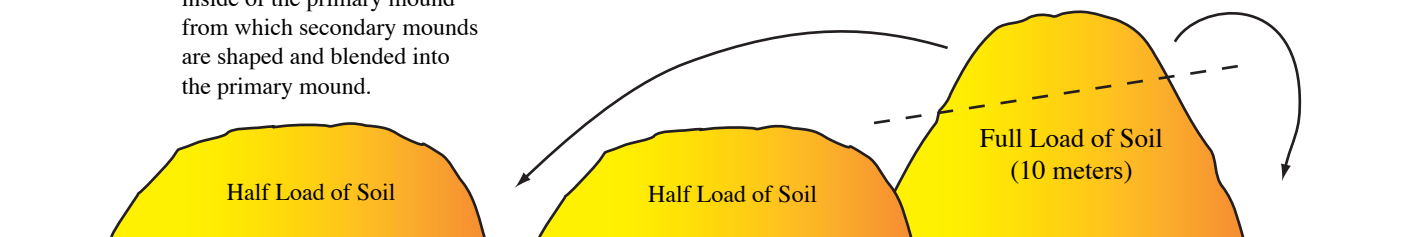


Figure 1: Before Shaping the Mound System

Secondary mounds are shaped within the primary mound and are used to form a number of different living areas. They can be 500 - 700 mm high.

This mound system can be designed to fill a front yard 30 meters wide and 17 meters deep. Always use plenty of soil.

The primary mound has a smaller sitting area about 1 meter wide and a height of 700 - 900 mm.

The outside slope is about 50°.

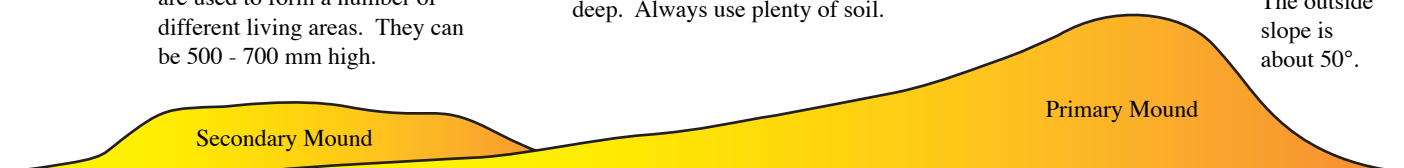


Figure 2: After Shaping the Mound System

# Mound Building Photographs - Pipalyatjara/Kalka

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June 2002



1. View of a truck load of soil being directed along the crescent shaped centre line. It will be tipped against the previous load, forming the general shape of the first mound at Pipalyatjara [October 2000].



2. View of enthusiastic workers shaping the first mound at Pipalyatjara. The top is flattened off and the general shape of the profile is being formed [October 2000].



3. A bobcat is being used to shape the outside slope of the first mound at Pipalyatjara. School children were a great help shaping the mounds [October 2000].



4. View of the first half of the crescent shaped mound being built to fill the median strip at Pipalyatjara. Note the flat top on the mound for sitting and standing [October 2000].

# Mound Building Photographs - Pipalyatjara/Kalka

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5. View of soil which has been tipped along a centre line, thus determining the general shape of the mound. Note the half loads of soil on the inner side of the mound which will be used to form the floor [October 2000].



6. View of the completed first mound and the beginning of the second at Pipalyatjara. Note the drum oven which was used to cook evening meals, adjacent to the floor of the first mound. [October 2000].



7. Soil being tipped around trees to form a continuous mound on an open compacted area at Pipalyatjara [May 2001].



8. View of an open compacted area at Kalka which has been eroded. Soil has been tipped around these trees and when shaped, will collect some of the storm water run-off [August 2001].

# Mound Building Photographs - Pipalyatjara/Kalka

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9. View of large volumes of soil which have been tipped around an outside shelter at Kalka. A low mound will be shaped from this soil [August



10. Care should be exercised at all times and truck drivers should be given clear directions when soil is being tipped from large trucks. Mounds are easier to shape when soil is tipped in the correct location [August 2001].



11. View of a low mound which has been built around trees and an outside shelter at Kalka. Mounds have enhanced these living areas [August



12. View of a low horse shoe shaped mound which has been built around some trees at Kalka. This mound is being used as a craft area [June 2001].

# Mound Building Photographs - Pipalyatjara/Kalka

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13. View of the Amphitheatre built outside the office at Pipalyatjara. Note the shallow profile on the inner side which provides a good venue for meetings [October 2000].



14. View of the large support mound which surrounds the Amphitheatre outside the office at Pipalyatjara. The large flat area on top is a good venue for people to sit, talk and be seen by others in the community [May 2001].



15. View of a bobcat being used to shape and level the top of the Amphitheatre at Pipalyatjara [May 2001].



16. A small tractor with a front end bucket was effectively used to drag soil out from the Amphitheatre and produce a gradual side slope [May 2001].

# Mound Building Photographs - Pipalyatjara/Kalka

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17. View of the Amphitheatre which was built as part of the mound system around the office at Kalka. The meeting in progress demonstrates the "user friendly" function of mounds [April 2001].



18. View of part of the mound system which surrounds the office at Kalka. This area collects a large portion of the storm water harvested from the roof of the office [April 2001].



19. Consultation was an essential part of the mound building program. The views and comments of people were continually used to direct the program [May 2001].



20. As soon as mounds were built, they became places for people to congregate and talk. This is an important feature of Anangu culture [May 2001].



# Mound Building Photographs - Pipalyatjara/Kalka

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21. View of fresh soil which has been tipped in a crescent shape in a front yard at Kalka after the fence has been removed. An outer primary mound will be shaped to encircle inner secondary mounds [August 2001].



22. View of part of the mound system which has been shaped from the soil in picture 21. Note the outer primary mound and inner secondary mounds which flow in around the trees to the front veranda [August 2001].



23. View of a finished mound system in a front yard at Pipalyatjara surrounded by the newly designed pannel fence. The mound in the back ground surrounding two peppercorn trees was the first to be built in a front yard



24. View of a mound which has been built outside a house yard at Pipalyatjara and has been used as an outside living area [August 2001].