A portable camp including a sewerage utility network

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ABSTRACT

The present invention relates to camps that are of a portable self-sufficient type and that include a plurality of buildings. The camp includes various utilities such as electrical power and sewerage that is connected to each building. These utilities are provided to the buildings in a series arrangement leading to a simpler more efficient constructional requirement. In the case of sewerage each building feeds sewerage from a number of outlets in series to a sewerage box. A macerator within the box macerates the waste and pumps it to a main sewerage line, a number of such sewerage boxes connected in a series arrangement to the sewerage line.
A portable camp including a sewerage utility network

BACKGROUND OF THE INVENTION

The present invention relates to a system of providing utility services to a portable camp and in particular to the provision and distribution of services within the camp, the services configured to enable quick and easy commissioning and de-commissioning of the camp. The present invention in particular relates to the configuration used in the provision of a sewerage network connected to a plurality of buildings in such a camp.

Camps have been used for many years to provide shelter and accommodation especially in remote areas. This is especially so in the case of remote camps that are assembled using a number of transportable buildings, some of the buildings used as sleeping quarters, others as the kitchen and dining room facility and others still as recreational areas. It is not uncommon for a camp to consist of sixty to eighty buildings that can accommodate several hundred people.

These camps are completely self-contained in that the transportable buildings provide all of the facilities for a small remote community that may be needed in a particular area. Accordingly these camps include all of the modern day facilities such as electrical power, water, sewerage, and communication. They therefore also include their own power generation systems, water distribution systems, sewerage treatment plants, and communication facilities such as satellite dishes. The camps typically require a considerable amount of skill, time, and effort to assemble and commission. Once constructed these camps can however provide accommodation indefinitely if the infrastructure is maintained.

In some instances the camps have to be portable or mobile. For example, during construction of infrastructure across a vast area, such as roads or pipelines supplying water or gas, a particular location for a camp housing the construction workers, may only be viable for several weeks or months. As the pipeline is progressively constructed, there is a balance between the economic cost of the travel time of workers housed in the camp to the current work site and time spent constructing the actual pipeline. It is therefore accepted in the industry that if the travel time between a camp and the work location is more than an hour, a new camp has to be constructed that is closer to the work location. At that time, a new camp is therefore constructed one hour ahead of the current construction location or generally up to several hundred kilometres away from the existing camp.
A camp for several hundred people takes some time to construct and commission. Accordingly, construction work on the particular project has to stop for one or two weeks whilst the camp is relocated. Alternatively there are two duplicate camps used so that whilst one camp is being used the other is being de-commissioned from one location to be assembled at another location. Either solution has its disadvantages. The first increases the time for a particular project whilst the second is a duplication of infrastructure that requires significant capital. Furthermore, both solutions require skilled personnel. Thus qualified trades people need to be permanently employed such as licensed plumbers and electricians. Not only is this a direct cost but also it reduces the ability of the camp to employ local people, a factor very important in remote areas and communities.

It is an object of the present invention to overcome at least some of the abovementioned problems or provide the public with a useful alternative.

It is a further object of the present invention to provide for a portable camp comprising of a plurality of transportable building and a method for the commissioning and de-commissioning thereof of a sewerage network.

It is yet a further object of the present invention to allow for the commissioning and de-commissioning of a portable camp using in part non-skilled or semi-skilled labour.

SUMMARY OF THE INVENTION

Therefore in one form of the invention there is proposed a portable camp including:

- a first building having a plurality of sewerage outlets, said outlets connected through a sewerage outlet pipe in a series arrangement to a first sewerage collection box;
- said first sewerage collection box including a macerator adapted to macerate collected sewerage and pump it to a main sewerage line;

- a second building having a plurality of sewerage outlets, said outlets connected through a sewerage outlet pipe in a series arrangement to a second sewerage collection box;
- said second sewerage collection box including a macerator adapted to macerate collected sewerage and pump it to said main sewerage line.

In preference said first sewerage collection box is fed sewerage from a plurality of buildings in a parallel arrangement.

In preference said main sewerage line is connected to a sewerage sub-station.

Preferably said main sewerage line is connected to a sewerage treatment plant.
In a further form of the invention there is proposed a sewerage collection system including a plurality of sewerage collection boxes connected to a main sewerage line, each sewerage collection box itself fed sewerage from sewerage collection points in a series arrangement.

5 BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several implementations of the invention and, together with the description, serve to explain the advantages and principles of the invention.

In the drawings:

10 Figure 1 is a schematic diagram illustrating current known ways to electrically connect a portable camp and utilising separate power cables from the generator for each building;

Figure 2 is a schematic diagram illustrating an alternate currently used way to electrically connect a portable camp and including a central hub that feeds a particular phase to several building in a series;

15 Figure 3 is a schematic diagram of the partial layout of a portable camp illustrating the various utility connections embodying the present invention;

Figure 4 is a perspective view of a chassis of a typical portable building, the chassis adapted to house the sewerage utility outlets for individual rooms within the portable building;

Figure 5 is a perspective view illustrating the individual sewage box adapted to service one or two rooms in each portable building;

Figure 6 is a schematic diagram of the partial layout of a portable camp illustrating a typical sewerage connection embodying the present invention;

20 Figure 7 is a typical plan of the partial layout of a portable camp illustrating a sewerage connection between a number of buildings and embodying the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS
The following detailed description of the invention refers to the accompanying drawings. Although the description includes exemplary embodiments, other embodiments are possible, and changes may be made to the embodiments described without departing from the spirit and scope of the invention. Wherever possible, the same reference numbers will be used throughout the drawings and the following description to refer to the same and like parts.

Illustrated in Figures 1-3 is a typical camp 10 comprising a plurality of buildings, generally of the transportable type where they can either be transported by loading onto trucks, or alternatively, mounted on wheels that are bolted to the chassis of each building.

For the purposes of the present explanation there is illustrated in Figures 1-3 eight buildings 12, 14, 16, 18, 20, 22, 24, and 26 that are typically used to provide accommodation, each building having four separate rooms, each room having its own access door 28, 30, 32, and 34 respectively. It is however to be understood that the present invention is not limited to accommodation buildings and they it may equally well apply to other types of buildings, such as the kitchen, common rooms and offices.

To function properly, each of the buildings must be provided with the appropriate utilities such as power, water, and sewerage. Typically in each camp there will be one central point for each of these facilities. Thus in a camp it may be expected that there will be a three phase power generator 36 located some distance away from the camp to minimise noise intrusion. There may also be a sewerage treatment plant to collect and processes all of the waste produced by the camp (shown in Figures 6 and 7). However for the purposes of brevity we will limit the initial discussion to electrical power distribution only although it is to be understood that the general principle applies to other utility services as well. These will be discussed later.

There are currently two methods to feed power from the generator 36 to each of the buildings 12 to 26. The first is illustrated in Figure 1 where each building is fed power from the generator using a unique power cable. Thus building 12 is fed power from generator 36 using cable 12a, building 14 using cable 14a, building 16 using cable 16a and so on. The advantage of such an arrangement is that the operator can control the load on the generator particularly important when one is generating three-phase power to ensure that the three phases are loaded equally. The major disadvantage is that with numerous buildings, numerous cables are required each of a varying length. The reader will appreciate that this will therefore not only take time to set up not only due to physically laying out the cables, but also due to choosing an appropriate cable that is of a desired length. Having numerous cables
is also not only expensive but also requires that there be good management and transportation of each cable.

An alternate way of providing power to the camp is illustrated in Figure 2. The generator here provides power using a single (or maybe two or three) cables 36a to a central distribution hub 38 from which power is fed separately to each building. Thus building 14 is provided power through cable 14b, with a separate cable 12b then connecting building 12 in series with building 14. Similarly building 16 is provided power from the central hub 38 using cable 16b, then connecting building 18 in series to building 16 through cable 18b. The advantage of this arrangement is that the number of cables running from the generator 36 is reduced. In addition the operator of the camp has greater flexibility as to which building is fed power from which phase from the central hub assuming that the generator is a three-phase generator. The disadvantage is that different length cables are still needed from the central hub to each building and that once connected, buildings in series are provided power from the same phase.

These methods of providing power are also found in the provision of water and sewerage networks in typical portable camps, that is, each separate building in a camp is separately connected to a distribution or a collection centre.

According to the present invention and as illustrated in Figure 3 there is provided a unique way of providing utilities to a portable camp. The generator 36 feeds three-phase power through cable 38 to the first building 12. Each of the buildings is then fed in series from building 12 so that building 14 is fed power using cable 14c from building 12, building 16 is then fed power through cable 16c from building 14, building 18 is fed power from building 16 using cable 18c, building 20 is fed power from building 18 using cable 20c and so on.

The advantage of such an arrangement is that, with the exception of the main cable from the generator 36 to the first building 12, all of the other cables are one of two lengths. The reason for this is that in most camps, the buildings are positioned in a matrix arrangement with the distances between adjacent rows and adjacent columns being the same. Thus cables 14c, 16c, and 18c are all of the same length joining across several buildings, the other length of cable being 20c joining buildings across their ends.

This provides a significant advantage over hitherto known methods of electrically connecting buildings. First, only two lengths of cable are needed meaning that cables are not building specific and when the camp is being installed time is not spent searching for an
appropriate cable. This is extremely important for one of the major costs in setting up portable camps is in transporting them to a new location. The present invention greatly simplifies this by enabling the operator to quickly set-up/dismantle a portable camp reducing the overall cost of labour. Secondly, the cables between buildings are advantageously of the male and female plug type arrangement. This enables the power between buildings to be connected using semi-skilled labour reducing the reliance on skilled electrical tradesmen. Whilst some of the work will still require skilled electrical people, this is greatly reduced.

Of course, in a camp where there are a large number of buildings, it would not be feasible to distribute power in one series across all of the buildings. To do so would require heavy-duty cables with significant capacity to ensure that they are not overloaded. Such camps may therefore have a central hub that feeds clusters of buildings, the distribution of power in between clusters as described above with reference to Figure 3.

One can now appreciate that connecting buildings in such a series arrangement overcomes the problems of having cables of different lengths and enables some of the electrical connections to be assembled by semi-skilled workers. As each building is assembled on a new campsite, one simply electrically joins the building to the previous one using one cable. Of course, care must be taken to ensure that the total load on the main power feed 38 from the generator to the power box 40 on the first building does not exceed its rating, something that can be easily calculated.

Referring now to Figure 4, it will be appreciated that the same principle may equally well be used in relation to the connection of sewerage. Thus illustrated in Figure 4 is the chassis of a portable building 60 including various structural features that will not be discussed in further detail. Mounted to the chassis are two sewerage boxes 62a and 62b that are permanently connected to the sewerage outlets of several rooms of the transportable building. Thus, with reference to Figure 5, two rooms feed sewerage water to sewerage box 62a through two pipes 64a and 64b. The two sewerage boxes are also connected to each other through pipe 66, and also have outlet pipes 68a and 68b that enable this building to be connected in series with another.

To commission each building one simply needs to connect outlet pipes 68a and 68b between each building. To facilitate this, the ends of the pipes may have well known features that enable pipes to be easily connected to each other as would be well known by any skilled plumber.
A more detailed view of the sewerage box is illustrated in Figure 5 where one can see the sewerage box 62a including two access holes 70a and 70b that are adapted to connect pipes 64a and 64b from two rooms. A further access hole 72 is used to connect two sewerage boxes together via pipe 66, whilst the fourth access hole 74 enables connection of the two sewerage boxes now in series to be connected to another building or to a main pipe that leads to a sewerage plant. Each of the access holes includes a threaded boss so that if the access hole is not required, as would be the case with the last building in the series, the access hole can simply be screwed shut by an appropriate plug. Outlet 77 is also provided to allow one to feed macerated sewerage to a main sewerage line as discussed below.

Inside the sewerage box there is typically included a sewerage pump that breaks down the sewerage and assists in pumping it through the pipes joining the various sewerage boxes, or alternately as shown later to a central collection pipe that is then fed to a sewerage collection point or treatment plant.

The advantage of the above arrangement is that enables once again, as in the case of the electrical connections, semi-skilled workers to commission the sewerage for a particular camp. Furthermore, the location of the sewerage boxes suspended from the building chassis means that they do not have to be buried in the ground, as is the current procedure. This also reduces the necessity to bury sewerage pipes for a particular building once again reducing the difficulty in setting up the sewerage utility. Of course, if the buildings are raised high enough above the ground, the sewerage boxes themselves do not need to be buried provided that they are at a level below each of the buildings they are collecting sewerage from.

Where there are small camps or clusters of buildings, as illustrated in Figure 6, a single sewerage box 76 is used to collect sewerage from four buildings 78, 80, 82 and 84, each building having several outlets such as outlets 78a and 78b on building 78, feeding sewerage through pipe 86 to box 76. Located within the box is a macerator (not shown) that breaks or macerates the sewerage up and then pumps it through a disposal hose 88 to a sewerage treatment plant or sub-station 90. As shown in Figure 6 where there are only eight buildings, then two separate sewerage collection boxes may feed independently into the sub-station 90.

In the case of a number of buildings, as illustrated in Figure 7, a number of sewerage boxes 92a-f may be connected in a series type of arrangement whereby each of the sewerage boxes is fed sewerage from a number of outlets from a number of buildings, each building feeding in a series type arrangement to an inlet of a sewerage box. Thus sewerage box 92d is fed sewerage from buildings 94a-d, each building having four sewerage outlets connected in
series to a pipe 96 feeding sewerage to box 92d, the box having four sewerage inlets such as inlet 98a. Located within the box is a macerator (not shown) that breaks down the sewage and pumps it through small outlet hose 100 to main sewerage line 102. The main sewerage line is then fed to a sewerage treatment plant 104, that in the case of a large camp may in fact be a sub-station that is then fed sewerage from a number of such lines 102 to then feed to a sewerage treatment plant.

Although not shown, the above configuration may equally well be used for other utilities including the provision of water.

Further advantages and improvements may very well be made to the present invention without deviating from its scope. Although the invention has been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

In any claims that follow and in the summary of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprising" is used in the sense of "including", i.e. the features specified may be associated with further features in various embodiments of the invention.
CLAIMS

1. A portable camp including:
   a first building having a plurality of sewerage outlets, said outlets connected through
   a sewerage outlet pipe in a series arrangement to a first sewerage collection box;
   said first sewerage collection box including a macerator adapted to macerate collected
   sewerage and pump it to a main sewerage line;
   a second building having a plurality of sewerage outlets, said outlets connected
   through a sewerage outlet pipe in a series arrangement to a second sewerage
   collection box;
   said second sewerage collection box including a macerator adapted to break down
   collected sewerage and pump it to said main sewerage line.

2. A portable camp as in claim 1 wherein said first sewerage collection box is fed
   sewerage from a plurality of buildings in a parallel arrangement.

3. A portable camp as in any one of the above claims wherein said main sewerage line is
   connected to a sewerage sub-station.

4. A portable camps as in claims 1 or 2 wherein said main sewerage line is connected to
   a sewerage treatment plant.

5. A sewerage collection system including a plurality of sewerage collection boxes
   connected to a main sewerage line, each sewerage collection box itself fed sewerage
   from sewerage collection points in a series arrangement.

6. A portable camp substantially as hereinbefore described with reference to Figure 6.

7. A portable camp substantially as hereinbefore described with reference to Figure 7.