State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Technical Guidance Committee Meeting

Agenda*

Wednesday, January 30, 2013

9:15 a.m. – 4:30 p.m.

Department of Environmental Quality
Conference Room C
1410 N. Hilton
Boise, Idaho

9:15 AM Call to Order/Roll Call
- Sign in sheet for attendees who wish to comment or present to the committee members
- Introduction of committee members, guests and attendees

9:20 AM October 23, 2012 Draft TGC Meeting Minutes: Review, Amend or Approve

9:30 PM Open to Public Comment – ½ hour reserved for public to provide comments to the TGC on subjects not on the agenda

10:00 AM ETPS Subcommittee Update
- Update to TGC on what the ETPS Subcommittee has discussed and produced to date
- Input from TGC on further direction they would like to see in regards to the subcommittee

10:30 AM Introduction of New Technical Guidance Manual Format
- Changes were made so that the document meets DEQ's style guide for guidance.
- There were several formatting issues with the old version and the new version will remove those issues.

10:50 AM Break – Ten Minutes

11:00 AM Old Business/ Final Review
- 2.1 Medium Sand Definition (**Appendix A**)
  - Table 2-6
- 4.12 Gravelless Trench System (**Appendix B**)
- 4.20 Pressure Distribution- In-Tank Pumps (**Appendix C**)

12:00 to 1:00 P.M. Lunch

1:00 PM New Business/ Draft Review
- 4.20 Pressure Distribution System (**Appendix D**)

  - Pump to Drop-Box (figure available at meeting)
- 4.26 Seepage Pit (**Appendix E**)
- 4.15 Holding Tank and 4.21 RV Dump Station (**Appendix F**)
  - Separation of Holding Tank and RV Dump Station Guidance
- 5.10 Pipe Materials for Specified Uses (**Appendix G**)
- 3.2 Serial Distribution (figures available at meeting) (**Appendix H**)

2:50 PM Break – Ten Minutes

3:00 PM New Business/ Draft Review
- Continued from 1:00 PM agenda items

4:25 PM Schedule Next Meeting

4:30 PM Adjourn

TGC Parking Lot. This is a list of issues requested to be prepared by the TGC.

- O&M content in Chapter 7 and in Chapter 4
- Sand Mound slope correction factors
- 4.20 Pressure Distribution System
  - Low Pressure Wastewater Handling System Guidance update

*Begin and end time will be observed. Agenda items and their allotted times my vary dependent upon the amount of interest and participation for each item.

The call in number is 373-0101 Bridge # 1

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1) **Visit the Website Below**
   https://www3.gotomeeting.com/join/892574662

   Meeting ID: 892-574-662

2.1.4 Medium Sand

The following definitions may be used to determine if a soil texture is a medium sand:

1. Conforms to the gradation requirements of American Society for Testing and Materials (ASTM) C-33 and less than 2% passes a #200 sieve (**Table** Error! No text of specified style in document.**-1**).
2. Conforms to the USDA definition of a medium sand (~~Table 2-6).~~
3. A sand with a mean particle size (D_{50}) of no more than 0.5 millimeter (mm) and a coefficient of uniformity (C_u) of 8 or greater has been shown to sustain a biological mat and will be acceptable in systems under continual use.

Table Error! No text of specified style in document.**-1. Modified ASTM C-33 medium sand allowable particle size percent composition.**

Sieve Size	Passing (%)
4	95–100
8	80–100
16	50–85
30	25–60
50	10–30
100	2–10
200	< 2

~~**Table 2-6. United States Department of Agriculture test for medium sand.**~~

~~Sieve Size~~	~~Millimeter Size~~	~~Passing (%)~~
~~4~~	~~2–10~~	~~100~~
~~10~~	~~1–2~~	~~75~~
~~16~~	~~0.1–1~~	~~50~~
~~140~~	~~0.05–0.1~~	~~0–15~~

Appendix B

4.12 Gravelless Trench System

Revision: October 23, 2012

4.12.1 Description

A gravelless trench system meets all the requirements of a standard trench system except that the drainrock is replaced by an approved gravelless trench component (section 5.7). Typical components include gravelless chambers, large diameter nylon fabric wrapped piping of varying dimensions, and drainrock substitution systems. Gravelless trench systems are allowed a reduction in trench bottom square footage due to the reduced masking of infiltrative surface. The reduction is only allowed in trench designs up to 36 inches in width. No reduction is allowed for installation widths greater than 36 inches, or for installation in sand mound designs.

4.12.2 Approval Conditions

1. Unless otherwise noted, the system must be installed according to the gravelless trench component manufacturer's recommendations.
2. An approved septic tank effluent filter (section 5.9), based on manufacturer's recommendations may be installed at the septic tank outlet for basic drainfield applications (pump chamber and extended treatment system applications are exempt from this approval condition).
3. Reduction in square footage cannot be in addition to other allowable disposal area reductions (i.e., drainfield reductions due to increased application rates for treatment).

~~1.~~4. The measured width of the installed product should be at least 90% of the excavated trench width (section 5.7, table 5-6).

4.12.3 Design

1. Length of ~~pipe~~ gravelless trench product needed should be calculated on the following basis:

    a. ~~8 inch diameter pipe = 2 ft^2 effective area~~ Disposal trench length is determined by the application rating for each product (section 5.7, table 5-5, rating column)

    Example (large diameter pipe):

    i. Product selected has a rating (square feet of application area per linear foot) of 1.33 ft^2/ft

    ~~i.~~ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)

~~ii.~~iii. ([250 GPD]/[0.6 GPD/ft^2])/(1.33 ft^2/ft) = 314 linear feet of gravelless trench product

Example (gravelless chamber):

i. Product selected has a rating (square feet of application area per linear foot) of 4.0 ft^2/ft

ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)

~~i.~~iii. ([250 GPD]/[0.6 GPD/ft^2])/(4.0 ft^2/ft) = 105 linear feet of gravelless trench product

b. ~~10-inch diameter pipe = 3 ft^2 effective area~~Disposal trench length is calculated the same way for both gravelless pipe and gravelless chamber products (attention must be paid to specific product application ratings).

~~b.~~c. Width of trench is dependent upon the manufacturer's installation requirements for each approved product.

~~2. Effective area is equivalent to trench bottom area.~~

~~Example: A three-bedroom home (250 GPD) on a site with sandy loam soil (soil design subgroup B-1, 0.6 GPD/ft^2) would require 209 linear feet of 8-inch pipe ([250/0.6]/2) or 139 linear feet of 10-inch pipe ([250/0.6]/3).~~

2. Individual lines in soil design group C soils should be as long as possible, not exceeding the 100-foot maximum.

~~4. An inspection port/sludge sump should be installed at the end of each line.~~

4.12.4 Construction

1. The trench should follow the contour of the land~~, and the pipe should be installed between 18 and 36 inches below the surface~~.

2. Trench excavations should not be less than ~~18~~12 inches wide and no more than 36 inches wide. Width dimensions will be dependent upon the manufacturer's installation instructions.

3. Pipe must be installed level ~~with an allowable variation of not more than one-half inch per 100 feet~~. A transit, engineer's level, or surveying station is required.

4. Effluent piping entering gravelless chambers should be installed into the highest inlet hole available on the chamber end cap.

5. An inspection port/sludge sump should be installed at the end of each line.

6. Large diameter gravelless pipe products should be covered with geotextile fabric, untreated building paper, or a 3 inch layer of straw unless the product has a built in filter fabric in the design.

    a. Gravelless chambers are not required to be covered with geotextile fabric, untreated building paper, or straw unless specifically required by the manufacturer.

7. Care must be taken not to over-excavate trench width wider than the product width

    a. If over-excavation is unavoidable hand backfilling of trench should be performed up to the product height and fill should be walked in to ensure sidewall support of the product.

~~*Note*: Gravelless domed chamber systems are awarded a 25% reduction in size if arranged in trenches. No reduction is allowed for bed or sand mound designs.~~

Appendix C

4.20.3.5 In-tank Pumps

Placement of sewage effluent pumps in a septic tank is an acceptable practice under the following conditions:

1. The site is too small for the installation of a dosing chamber or a septic tank with a segregated dosing chamber compartment, or the flows are less than 100 gallons per day.

~~1.~~2. Sewage effluent pumps must be placed in an approved pump vault.

~~2.~~3. Effluent drawdown from the septic tank is limited to a maximum 120 gallons per dose with a maximum pump rate of 30 GPM.

~~3.~~4. Septic tanks must be sized to allow for 1-day flow above the high-water alarm, unless a duplex pump is used.

~~4.~~5. Pump vault inlets must be set at 50% of the liquid volume.

~~5.~~6. Pump vault placement inside the septic tank shall be in accordance with the manufacturer's recommendations.

~~6.~~7. Pump vault screens shall be one-eighth inch holes, or slits (or smaller); be constructed of noncorrosive material; and have a minimum area of 12 ft^2.

~~7.~~8. Pump vault and pump placement must not interfere with the floats or alarm, and the pump vault should be easy to remove for cleaning (Figure).

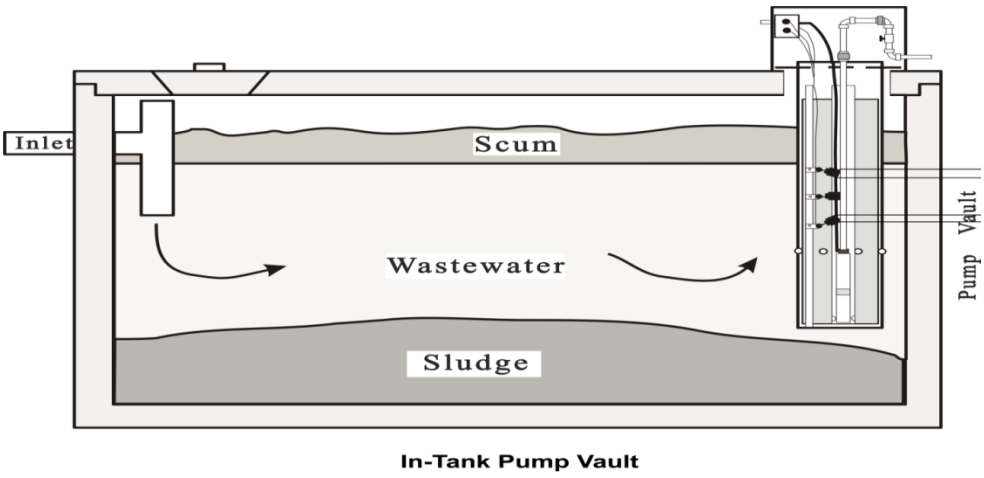

Figure 4-18. Example of effluent pump installed into single-compartment septic tank.

Appendix D

4.20.3.6 Pump to Drop Box

A pump to drop box system is utilized when an area for drainfield placement is not able to be reached by standard gravity flow from the wastewater generating structure. Standard drainfields located at higher elevations than the septic tank are not required to be designed as a pressure distribution system unless the square footage of disposal area exceeds 1500 square feet. When the drainfield is not pressurized wastewater is conveyed by a pump through a pressurized line to a drop box where effluent pressurization breaks to gravity distribution into the drainfield.

1. Pump selection, transport (pressure) line design, dosage, and dosing chamber or in-tank pump design shall follow the procedures within section 4.20 Pressure Distribution System of the Technical Guidance Manual.
2. Pumps should be sized to effectively deliver a maximum dose of 120 gallons with a maximum pump rate of 10 GPM.
3. Effluent velocity in the transport (pressure) line should be between 2 to 4 feet per second.
4. Due to large backflow and velocity potential a check valve should be installed on the effluent line after the pump and prior to leaving the pump chamber.
    a. Effluent lines should be installed at a depth below the frost line.
5. A drop box should be installed that allows equal gravity distribution to all drainfield trenches.
6. Upon entry into the drop box the effluent line should be angled to the bottom of the box with the effluent line terminating above the high water level of the drop box.
    a. A ¼ inch hole should be drilled in the top of the angle connection to prevent a potential siphon.
7. A complex installer's permit shall be required for installation.
8. The pump to drop box system design may require engineering based upon the regulatory authority's judgment.

Appendix E

4.26 Seepage Pit

4.26.1 Definition

An absorption pit filled with standard drain field aggregate.

4.26.2 Conditions for Approval

1. Seepage pit disposal facilities may be used on a case by case basis within the boundaries of District Health Department Seven when an applicant can demonstrate to the district director's satisfaction that the soils and depth to ground water are sufficient to prevent ground water contamination. The district director shall document all such cases. (IDAPA 58.01.03.008.11)

    a. ~~2.~~ For all other districts, replacement seepage pits may be allowable as a last resort if no other alternatives are feasible, and the site meets conditions of approval ~~2~~1.a through ~~-~~6. (IDAPA 58.01.03.008.12). The permitting health district director shall document all such cases. (IDAPA 58.01.03.008.11)

2. The site must meet the requirements of a standard system except that it is not large enough. (IDAPA 58.01.03.008.11.b)

~~1~~3. The area must not have any shallow domestic, public wells or sink holes connected by underground channels.

~~3~~534. The pit bottom must be no deeper than eighteen (18) feet below the natural ground surface. The bottom of the pit must conform to the effective soil depth chart (IDAPA 58.01.03.008.02.c). *The top of the pit may be more than four (4) feet below the surface.*

~~4645~~. Seepage pits may not be installed in Group C soils.

6. A test hole must be performed to a depth of 6 feet below the proposed termination of the bottom of the seepage pit prior to permit issuance.

4.26.3 Sizing

The effective area of the pit may be determined ~~from Table 4-23:~~ by the square footage of the pit sidewalls below the effluent pipe.

Example: Pit dimensions are 10 feet wide by 10 feet long and the pit is 8 feet deep below the effluent pipe: (10 feet wide/long) x (8 feet deep) = 80 square feet → (80 square feet) x (4 sidewalls of same dimension) = 320 square feet.

~~1. Table 4-23. Effective Area of Seepage Pits~~

~~Diameter of Seepage Pit, in Feet~~	~~Effective Depth Below Flow Line, in Feet~~									
	~~1~~	~~2~~	~~3~~	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~	~~9~~	~~10~~
~~3~~	~~9~~	~~19~~	~~28~~	~~38~~	~~47~~	~~57~~	~~66~~	~~75~~	~~85~~	~~94~~
~~4~~	~~13~~	~~25~~	~~38~~	~~50~~	~~63~~	~~75~~	~~88~~	~~101~~	~~113~~	~~126~~
~~5~~	~~16~~	~~31~~	~~47~~	~~63~~	~~79~~	~~94~~	~~110~~	~~126~~	~~141~~	~~157~~
~~6~~	~~19~~	~~38~~	~~57~~	~~75~~	~~94~~	~~113~~	~~132~~	~~151~~	~~170~~	~~188~~
~~7~~	~~22~~	~~44~~	~~66~~	~~88~~	~~110~~	~~132~~	~~154~~	~~176~~	~~198~~	~~220~~
~~8~~	~~25~~	~~50~~	~~75~~	~~101~~	~~126~~	~~151~~	~~176~~	~~201~~	~~226~~	~~251~~
~~9~~	~~28~~	~~57~~	~~85~~	~~113~~	~~141~~	~~170~~	~~198~~	~~226~~	~~254~~	~~283~~
~~10~~	~~31~~	~~63~~	~~94~~	~~126~~	~~157~~	~~188~~	~~220~~	~~251~~	~~283~~	~~314~~
~~11~~	~~35~~	~~69~~	~~104~~	~~138~~	~~173~~	~~207~~	~~242~~	~~276~~	~~311~~	~~346~~
~~12~~	~~38~~	~~75~~	~~113~~	~~151~~	~~188~~	~~226~~	~~264~~	~~302~~	~~339~~	~~377~~

4.26.4 Construction

1. Standard drainfield aggregate shall be used to fill the entire pit excavation.

~~1.~~2. Effluent pipe shall be covered with a minimum of two (2) inches of aggregate.

~~2.~~3. Seepage pit excavation shall be covered with geotextile, straw or untreated building paper.

~~3.~~4. Effluent Pipe shall be installed to the geographic center of the pit.

Appendix F

4.15 Emergency Holding Tank

Revision: ~~April 21, 2000~~January 17, 2013

4.15.1 Description

An emergency holding tank is a sealed ~~vault~~ septic tank for the temporary storage of water-carried sewage. The ~~vault~~ septic tank is pumped periodically, and the sewage is disposed of at a secondary treatment site.

4.15.2 Approval Conditions

1. An emergency situation exists and installation of a holding tank is necessary to prevent a potential public health hazard.

2. A management entity or arrangement to provide maintenance and pumping of the tank by a ~~licensed~~ permitted septic tank pumper must be approved by the Director. Such an entity or arrangement must be in operation ~~at the time~~prior to the emergency holding tank permit being~~is~~ issued.

    a. The arrangement and permitted septic tank pumper shall be provided in writing prior to the issuance of the emergency holding tank permit being issued.

~~2.~~3. May not be approved for new ~~dwellings~~wastewater generating structures.

~~3.~~4. May not be approved for permanent, year-round ~~residences~~ structures except temporarily to satisfy approval condition 1.

5. Sites may not be subject to flooding.

6. The emergency holding tank permit shall specify a specific date or specific predetermined circumstance for the abandonment of the emergency holding tank (IDAPA 58.01.03.005.13).

    a. The specific date or predetermined circumstance shall be provided in writing and be signed by the permit applicant prior to permit issuance (IDAPA 58.01.03.005.13).

4.15.3 Requirements

1. Must meet the distance limitations of a septic tank (IDAPA 58.01.03.007.17).

2. Must ~~be watertight, constructed of sound, durable materials, and not subject to excessive corrosion, decay, frost damage, or cracking (IDAPA~~

~~58.01.03.007.02)~~meet the septic tank design and construction standards as described in IDAPA 58.01.03.007.

a. Requirements of IDAPA 58.01.03.007.07, 58.01.03.007.08, 58.01.03.007.19, and 58.01.03.007.22 shall be exempt from the design and construction standards of an emergency holding tank.

3. ~~May be~~If the emergency holding tank is a modified septic tank ~~with inlet and~~the outlet opening shall be sealed.

4. A manhole extension shall be brought to finished grade at the inlet end of the emergency holding tank.

5. An emergency warning system shall be required to be installed to indicate when the emergency holding tank is two-thirds full.

~~3.~~6. The tank shall meet the volume requirements of a septic tank, except that no tank shall be less than 1,500 gallons.

~~4.15.4 Sizing~~

~~The tank shall meet the volume requirements of a septic tank, except that no tank shall be less than 1,500 gallons.~~

~~4.15.5 Other Requirements~~

~~4. Toilet structures over holding tanks must meet the requirements of structures over pit privies.~~

~~5. Access and pumping port must be located outside of any structure and should have a diameter of at least 8 inches.~~

~~6. A warning system may be required to indicate when the tank is two-thirds full.~~

4.21 Recreational Vehicle Dump Station

Revision: ~~October 13, 2004~~January 17, 2013

4.21.1 Description

Recreational vehicle (RV) dump stations are sealed vaults for the disposal of RV generated wastewater. RV dump stations pose a unique problem for subsurface sewage disposal systems because the recirculating fluid used in RV tanks contains formaldehyde and/or paraformaldehyde. The presence of these chemicals inhibits bacterial action inside of a septic tank, which leads to solids carry over and premature failure of the drainfield. Compounding the problem is that RV units recirculate the fluid several times before it is dumped. The fluid disposed in the dump station then is both strong and preserved. Because of these issues with RV generated wastewater RV dump stations should not be connected to subsurface sewage disposal systems.

~~**4.21.2 Disposal Systems Options for Recreational Vehicle Dump Stations**~~

~~7. Municipal treatment plant: This is the preferred option, if available. Research indicates that RV dump stations do not cause any problems for disposal in municipal treatment plants because of the dilution. Furthermore, formaldehyde is quite volatile and dissipates rapidly when exposed to an aerobic treatment process.~~

~~8. Community drainfield system: To date, there is no research available about the effects of RV dump station wastes on community drainfield systems. It is logical to assume that at some point the RV waste would be diluted sufficiently so that it should not pose a problem to a drainfield system, but what dilution would be acceptable is not now known. Until further research is completed, it is recommended that not more than 5% of the waste flow to a community septic system be generated by an RV dump station.~~

~~9. Holding tanks: If the tanks are pumped and disposed of at a municipal treatment plant, this should be an acceptable option. The holding tanks should have a high alarm system. The alarm float should be set to allow for a 1-day flow after the high alarm is reached.~~

4.21.2 Conditions for Approval

1. A management entity or arrangement to provide maintenance and pumping of the tank by a permitted septic tank pumper should be provided prior to permit issuance.

2. An RV dump station shall not have wastewater conveyed to it through a collection system.
    a. RV wastewater shall be discharged into the dump station vault directly from the RV's wastewater holding tanks.
3. If the RV dump station is a modified septic tank the inlet and outlet openings shall be sealed.
4. Sites may not be subject to flooding.
5. The RV dump station lid shall be sloped to the dump point and have a wastewater spill containment rim.
6. A source for dump station wash-down water shall be provided to the RV dump location.
    a. The water source shall meet the same separation distances from the RV dump as required by IDAPA 58.01.03.007.17.

4.21.3 Requirements

1. The RV dump vault must meet the distance limitations of a septic tank (IDAPA 58.01.03.007.17).
2. The RV dump vault must meet the septic tank design and construction standards as described in IDAPA 58.01.03.007.
    a. Requirements of IDAPA 58.01.03.007.07, 58.01.03.007.08, 58.01.03.007.09-10, 58.01.03.007.19, and 58.01.03.007.22.
3. If the RV dump vault is a modified septic tank the inlet and outlet opening shall be sealed.
4. A manhole extension shall be brought to finished grade that allows pumping access to the RV dump vault.
5. An emergency warning system shall be required to be installed to indicate when the RV dump vault is two-thirds full.
6. The RV dump vault shall meet the volume requirements of a septic tank, except that no RV dump vault shall be less than 1,500 gallons.
~~1.~~7. Any subsurface sewage disposal system serving RV spaces should include with the septic permit requirements to install an RV dump station that allows RVs to discharge their preserved waste prior to discharging waste to the subsurface sewage disposal system.

4.21.4 Recreational Vehicle Dump Station Waste Disposal

1. RV dump station waste shall be pumped and removed by a permitted septic tank pumper.

a. Wastewater from an RV dump may be disposed of at the following locations:
    i. Municipal treatment plant
    ii. Approved septage land application site
    iii. Approved public sewer

Appendix G

5.9 Pipe Materials for Specified Uses

Revision: ~~October 23, 2012~~January 17, 2013

Table Error! No text of specified style in document.**-2** shows pipe materials for specified uses.

Table Error! No text of specified style in document.**-2. Pipe materials for specified uses.**

Pipe Material and Specification[a]		Function[b]				
		House to ~~Tank~~[b]	Tank to Dosing Chamber	Tanks to Drainfield[c,d]	Gravity Drainfield[c,d]	Pressure Distribution System
ABS Sch. 40[e]	ASTM D2661		X	X	X	X
	ASTM F628		X	X	X	X
PVC Sch. 40	ASTM F891-10		X	X	X	X
PVC	ASTM D3034[f]		X	X	X	
	ASTM D2729				X	
	ASTM D2241		X	X	X	X
	AWWA C900		X	X	X	X
	ASTM D2665		X	X	X	
	ASTM D1785		X	X	X	X
PE	AWWA C906		X	X	X	X
	ASTM F810[g]			X	X	
	ASTM F405[h]				X	

Notes: polyvinyl chloride (PVC); acrylonitrile-butadiene-styrene (ABS); polyethylene (PE); American Society for Testing and Materials (ASTM); American Water Works Association (AWWA)
a. Or equivalent materials as specified by ASTM or AWWA.
b. See State of Idaho Division of Building Safety, Plumbing Bureau.
c. Specified in section 3.2.2 of the *Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems* (TGM).
d. Must use ASTM D3034 or equivalent as specified in 3.2.3 of the TGM. ASTM D3033 piping was previously approved for use spanning the tank to dosing chamber, tank to drainfield, and in the drainfield.
e. ABS Schedule 40 or piping material of equal or greater strength. Required by IDAPA 58.01.03.007.21.a.
f. Excavation must be compacted with fill material to 90% standard proctor density, with a minimum of 12 inches of cover material. Required by IDAPA 58.01.03.007.02.b.
g. Smooth wall high-density polyethylene (HDPE), white suitable for effluent and drainfield piping.
h. Corrugated HDPE, black with stripe, flexible, suitable for drainfield piping.

3.2.5 Equal Distribution

In equal distribution wastewater effluent is distributed to all trenches within the subsurface sewage disposal system thus providing the opportunity for utilization of the entire infiltrative surface of the disposal system. Equal distribution is the preferred method of wastewater discharge to any subsurface sewage disposal system. The best way to accomplish this is through pressurization of the drainfield (see section 4.20). When gravity flow is utilized for wastewater discharge to the subsurface system equal distribution can be accomplished through the use of a piping header or distribution box.

3.2.5.1 Piping Header

With a piping header system wastewater is conveyed to each disposal trench through the use of a network of solid piping. The discharge line from the septic tank should be split through the use of a T pipe fitting connected so that the wastewater runs into the top of the T. The T should be offset from the distribution trenches. One-directional sweeping cleanouts should not be used in place of a bi-directional T. See figure 3-3 for an overhead view of this distribution setup.

3.2.5.2 Distribution Box

Distribution boxes (d-box) are used to divide wastewater effluent evenly among multiple subsurface distribution lines. D-boxes are typically made of concrete or wastewater grade plastics and are watertight with a single inlet set at a higher elevation in the box than the several outlets. Outlets should be constructed at equal elevations to one another. The d-box should be constructed with an access lid. Access lids are recommended to be made accessible from grade. Distribution boxes should be installed level on a sound, frost-proof footing. There are several devices available for installation on the distribution lines leaving the d-box to ensure that each line is receiving equal amounts of effluent if the piping or d-box becomes un-level. See figure 3-4 for an overhead view of this distribution setup.

3.2.6 Serial Distribution

Due to continuous ponding over the infiltrative surface serial distribution trenches suffer hydraulic failure more rapidly and progressively because the infiltrative surface cannot regenerate its infiltrative capacity. With this in mind serial distribution should only be used on extremely sloped sites where equal distribution is not achievable. ~~On sloped ground, it is preferable to use serial~~ Serial distribution~~, that is, distribution~~ functions so that each trench ~~in order~~ is ~~completely filled~~ loaded and completely flooded before effluent flows to the next lower trench. ~~To maintain trenches between 2 to 4 feet below ground, it may be essential to use this kind of distribution.~~Loading and flooding is accomplished by installing relief lines or drop boxes between successive trenches.

3.2.6.1 Relief Lines

Relief lines are overflow lines that connect one trench to the adjacent lower trench. Relief lines are constructed of solid-wall piping and may be placed at opposite ends of successive trenches or anywhere within the trench line. If relief lines are installed in the middle of trenches successive relief lines should be offset by a minimum of 5 feet to avoid short circuiting the distribution system. Care must be exercised in excavating the connecting line between trenches. Bleeding of effluent down this excavation is a common cause of surfacing effluent in serial distribution systems. The excavation of the connecting trench to the next downslope trench should be just deep enough to accept the solid connector pipe. See figure 3-5 for a diagram of relief line installation.

3.2.6.2 Drop Boxes

~~Serial distribution may also be accomplished through the use of drop boxes.~~ The drop boxes are constructed so that each trench is completely flooded before the effluent flow runs to the next downslope trench. ~~Care must be exercised in excavating the connecting line between trenches. Bleeding of effluent down this excavation is a common cause of surfacing effluent in serial distribution systems. The excavation of the connecting trench to the next downslope trench should be just deep enough to accept the solid connector pipe.~~ The outlet invert of the drop box should be placed near the top of each trench to force the trench to fill completely prior to discharging to the next downslope trench. Solid-wall pipe should be used between drop boxes. ~~Figure 3-3~~ **Figure 3-** shows the detail of a drop box.

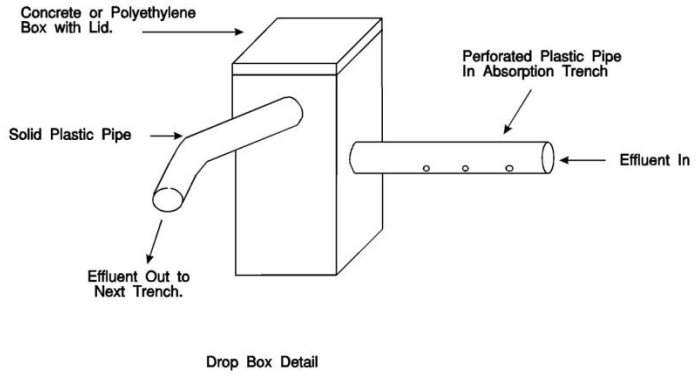

Figure 3-~~3~~6. Drop box details.