CENTRAL HAWKE'S BAY DISTRICT COUNCIL
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# ON SITE WASTE WATER DISPOSAL SITEINVESTIGATION, ASSESSMENT AND EVALUATION CHECKLIST.

## 1.0 SITE EVALUATOR

| | | |
|---|---|---|
| 1.1 | Name: | Registration No. |
| | Company | Address |
| | Phone: | Contact: |
| | Cell: | |
| | Fax: | |
| | e-mail | |

## 2.0 SITE INFORMATION.

| | | |
|---|---|---|
| 2.1 | Location Address: | |
| | Owner: | Owners Address: |
| | Phone:<br><br>Mobile: | Fax:<br><br>E-mail |
| 2.2 | **Legal Description**<br><br>Dp: BLK:<br><br>Area of Site: ( ha) | Lot No:<br><br>Valuation No. |

| | |
|---|---|
| 2.3 | Shape / Contour and layout of site? Accurately described in design and shown on site plan? YES /NO (Delete one)<br>Flat site YES / NO<br>Gentle slope YES / NO<br>Moderate to steep YES / NO<br>Steep YES / NO<br>**If not, this information must be supplied and approved prior to any installation.** |
| 2.4 | Are photographs of site attached? YES / NO (Delete one) |
| 2.5 | Percolation tests attached? YES / NO |
| 2.6 | Illustration of soil structure attached? YES / NO |

## 3.0HYDRAULIC LOADING INFORMATION.

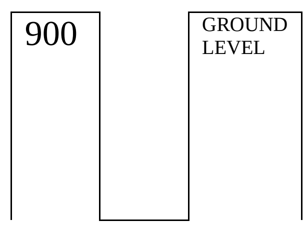
| | | | |
|---|---|---|---|
| 3.1 | Number of bedrooms | Number of persons | Design Load Rating per day ref: NZS 1547. |
| 3.2 | Waste Disposal Unit Installed YES / NO | | |
| 3.3 | Water saving devices installed YES / NO | | |
| 3.4 | Potable water supply/Rain water / Bore water / Reticulated. **(Circle supply used)** | | |
| 3.5 | Distances from system to bore or well in metres?<br>Shown on Site Plan? YES / NO | | |

## 4.0 SITE ASSESSMENT.

| | |
|---|---|
| 4.1 | Has the reserve field been identified on the site plans? YES / NO<br>**If not why not?** |
| 4.2 | Does the topography of the site suit the system design? YES / NO? |
| 4.3 | Are there any drainage flow paths that have to be considered YES / NO? |
| 4.4 | Has surface water run- off been taken into account? YES / NO |

| | |
|---|---|
| 4.5 | Are there cut off drains / Collector drains required YES / NO |
| 4.6 | Is the winter high water table known? YES / NO<br>What is the height if known?<br>How close will this be to bed floor approx? mm. |
| 4.7 | Are there site constraints with boundary or water course distances from the proposed field? YES / NO |

## <u>5.0 SUB-SOIL INVESTIGATION.</u>

| | |
|---|---|
| 5.1 | How was the soil profile determined?<br>Bore holes / Dug Test Holes / Earlier Site Excavation / Soil pit / Other (please specify)<br>**Circle one of the above.** |
| 5.2 | Have the soil tests been assessed by a third party? YES / NO |
| 5.3 | Has the soil structure profile been completed YES / NO<br>Have photographs been supplied YES / NO<br> |
| 5.4 | Has a percolation test been carried out? YES / NO<br>If YES please specify the method? |
| 5.5 | Are the percolation test results attached? YES / NO |
| 5.6 | Do the tests match the DLR expectations from the tables and soil categorization? YES / NO |
| 5.7 | **Circle the appropriate soil type:**<br><br>1. Gravel, coarse sand, rapid draining YES/NO<br><br>2. Coarse to medium sand, free draining YES/NO<br><br>3. Medium-fine-loamy sand, good drainage YES/NO |

| | |
|---|---|
| | 4. Sandy loam, loam and silt loam, moderate drainage YES/NO<br><br>5. Sandy clay loam, clay loam and silty clay loam, moderate to slow drainage YES / NO<br><br>6. Sandy clay, non swelling clay and silty clay, slow draining. YES / NO<br><br>7. Swelling clay, grey clay, hardpan, poor or non draining YES / NO |

## 6.0 SITE EVALUATION.

| | |
|---|---|
| 6.1 | Are there any environmental constraints? YES / NO<br>If YES please specify? |
| 6.2 | Are there any Hawkes Bay Regional Council or Central Hawkes Bay District Council Constraints? YES / NO<br>If YES please specify?<br><br>HBRC discharge permit number - |

| Soil Category | Soil texture | Structure | Indicative Permeability (Ksat) (m/d) | Design Load Rating (DLR) Primary – treated effluent Conservative rate (mm/d) | Primary – treated effluent Maximum rate (mm/d) | Secondary treated effluent (mm/d) | Indicative drainage class |
|---|---|---|---|---|---|---|---|
| 1. | Gravels and sands | Structureless Massive | <3.0 | 20<br>See note 7 &10 | 35<br>See note 7&10 | 50<br>See note 10 | Rapidly drained |
| 2. | Sandy Loams | Weakly structured<br>Massive | 20<br>1.4 – 3.0 | 20<br>15 | 35<br>25 | 50<br>50 | Well drained |
| 3. | Loams | High/moderate structured<br>Weakly structured or Massive | 1.5 – 3.0<br>0.5 – 1.5 | 15<br>10 | 25<br>15 | 50<br>30 | Moderately well drained |
| 4. | Clay Loams | High Moderate structured<br>Weakly structured<br>Massive | 05. – 1.5<br>0.12 – 0.5<br>0.06 – 0.12 | 10<br>6<br>4 | 10<br>10<br>5 | 30<br>20<br>10 | Imperfectly drained |
| 5. | Light Clays | Strongly structured<br>Moderately structured<br>Weakly structured or Massive | 0.12 – 0.5<br>0.06 – 0.12<br><0.06 | 5<br>See note 11. NZS1547<br>See note 11 | 8<br>5<br>See note 11 | 12<br>10<br>8 | Poorly drained |
| 6. | Medium to heavy clays | Strongly structured<br>Moderately structured<br>Weakly structured or massive | 0.06 – 0.5<br><0.06<br><0.06 | See note 11<br>See note 11<br>See note 11 | See note 11<br>See note 11<br>See note 11 | See note 11<br>See note 11<br>See note 11 | Very poorly drained |

**NOTES TO TABLE 4.2A1:**

1. **The DLR in mm/day is to be used to size the horizontal area of a conventional trench and bed systems. (Refer to paragrapgh4.2A7.3.1 for comment on the relationship between bottom area and sidewall absorption mechanisms.)**
2. **Where loading rates of 10mm/day or lower are required, it is critical that there is an even effluent loading over the design area.**
3. **The Design Loading Rates Table 4.2A1 are based upon the best available information at the time of preparation of this standard.**
4. **Primary treated effluent is the discharge from conventional septic tanks and improved septic tanks (such as 2 stage units and / or tanks fitted with solids control filters.) It includes all-waste, grey water and black water effluents.**
5. **Secondary treated effluent has a quality equal to or better than 20g/m$^3$ $BOD_5$ and 30 g/m$^3$ SS and typically is the effluent discharged from AWTS, sand filters or wetlands.**
6. **The values of indicative permeability $K_{sat}$ are based on the movement of water, and not effluent, through the soil. They are estimates only and shall be used with caution in the determination of soil category and DLR.**
7. **Conservative Design Loading Rates must be used for beds (see paragraph 4.2A7.2), for systems to be installed on steep sites and where other soil limitations are present. Conservative Design Loading Rates must always be used for primary treated black water effluent.**
8. **Maximum Design Loading Rates may only be used where the site and soil limitations are absent, and where there is evidence that these rates can be effectively maintained without harm to the environment, or without potential for failure of the system. Maximum Design Loading Rates may also be used for primary treated grey water effluent and for improved primary effluent from modified septic tanks. (Refer to clause 4.3.5.2.1.)**
9. **Indicative drainage classes listed are based upon the assumption that the drainage of water out of the soil is governed by only by the indicative permeability, and that external factors play no role.**
10. **The treatment capacity of the soil and not the hydraulic capacity of the soil or the growth of the clogging layer govern the effluent loading rate in Category 1 soil. Category 1 soils require special design and distribution techniques to help achieve even distribution of effluent over the full design surface ( see paragraph 4.5A4.2 ) for recommended discharge methods. These soils have low nutrient retention capacities, often allowing accession of nutrients to ground water.**
11. **To enable utilization of such soils for on-site wastewater disposal, alternative systems**

    **(including ETA/ETS systems ), special design requirements and distribution techniques, and/or soil modification procedures will be necessary. For any alternative system designed for these soils, the effluent absorption rate shall be based upon soil permeability testing. Specialist soils advice and special design techniques will be required for clay dominated soils having dispersive (sodic) or shrink/swell behaviour. Such soils shall be treated as Category 6 soil. In some situations, these soils will preclude the use of an absorption system only system design.**

    **If $K_{sat}$ ‹ 0.06 m/d, a full water balance for the disposal area ( including effective rainfall, run off, evapo-transpiration, ( see appendix 4.2D ), can be used to calculate the trench / bed size.**

| | |
|---|---|
| 6.3 | Type of sewer treatment system best suited to this ground type including the minimum septic tank size, make and model? |
| 6.4 | Type of disposal system considered best use for this site? |
| 6.5 | Minimum disposal area recommended (for trenches and beds see 6.8 below and table 4.2A1 NZS1547.<br><br>Area= square meters |
| 6.6 | Minimum size of reserve area (see HBRC and CHBDC requirements)<br><br>Area= square meters |
| 6.7 | Are sewer system and disposal system calculations and design plans attached? YES / NO<br>If not why not? |
| 6.8 | Trench and bed calculations from NZS 1547 2000 |

**CALCULATIONS:**

Length of drain = Q÷ (SUM of DLR $\times W$)

Example:
Q= Litres per day used = number of bedrooms
$\times$ 2 $people\ per\ bedroom \times litres\ used\ per\ person\ per\ day$.

Therefore 3bedrooms = 6 people

6 people x 180litres p.p per day =1080litres used
(180 litres is an example, consult NZS 1547 for minimum allowances to be used, or local and regional councils for minimum and maximum daily discharges)

Length of drain (Q) = 1080

Assume type 2 massive soil: 15x (trench width proposed) 0.6m

Therefore Q (Length of drain) =
$1080 \div 9 = 120 lm\ OF\ DRAIN\ @0.6M\ WIDE$
This equals 72$m^2$ of drainage.

## 7.0 GENERAL COMMENTS

| | |
|---|---|
| 7.1 | AS/NZS 1547:2000 "On site domestic waste water management" can be used for guidance in the on site assessment and soil evaluation. This standard can provide options for 'on site' waste water treatment and land application systems. |
| 7.2 | AS/NZS 1546 : 1998 "Septic tanks" has been adopted by the Central Hawkes Bay District Council. Unless a manufacturer has built their tanks to comply with this standard, and has had an engineer verify that the tanks comply with the same, then those tanks will not be permitted for used in Central Hawkes Bay. |
| 7.3 | Where it is necessary to make contact with the Hawkes Bay Regional Council in relation to an on sight waste water disposal design, the contact person is Mr. Tim Waugh (06) 835 9200. If you are in doubt, please call him or make use of their web site. |
| | **APPLICANT NAME** |
| | **SIGNATURE** |
| | **DATE** |

**Please use the sheet over to show your design calculations comply with this standard : NZS 1547**
**Number of bedrooms =**
**Number of people =**
**Litres of water per day per person =**
**Total litres used per 24hrs =**
**Width of drain intended =**
**DLR from table =**

**Length of drain 'Q' = TOTAL LITRES PER DAY =**
**DLR X TRENCH WIDTH**
**= Lm of trench**
**= $m^2$ of trench / bed**

**Size of design trench / bed as calculated =**

## IMPORTANT NOTES:

1. **FURTHER ATTACHED ARE THE TABLES REQUIRED FOR ETA/ETS, MOUND AND IRRIGATION SYSTEMS AND FIELD SIZE CALCULATIONS.**

2. **PLEASE SHOW RESERVE AREAS REQUIRED INCLUDING SIZES AS REQUIRED BY NZS 1547.**

3. **IF THE RESERVE AREA IS TO BE LESS THAN 100% THIS MUST BE JUSTIFIED BY YOUR DESIGN.**

4. **ALL SITE PLANS MUST SHOW DATUM HEIGHTS AND OVERLAND FLOW PATH DIRECTIONS FOR ANY SURFACE OR SHALLOW SUB SURFACE IRRIGATION AND DRIPLINE SYSTEMS.**

5. **ALL SYSTEMS MUST SHOW CROSS SECTIONAL DRAWINGS OF HOW THE SYSTEM WILL BE INSTALLED, WHETHER THEY ARE STANDARD TRENCHES OR AWTP SYSTEMS.**

6. **ALL SYSTEMS THAT REQUIRE SIGNAGE, FENCING AND PLANTING IN ANY FORM MUST BE INDICATED ON THE DRAWINGS. WHO DOES THIS WORK IS BETWEEN THE APPLICANT AND DESIGNER, HOWEVER, A CODE COMPLIANCE CERTIFICATE WILL NOT BE ISSUED UNLESS ALL COMPONENTS ARE COMPLETED.**

7. **ANYTHING OTHER THAN FULL COMPLIANCE WITH NZS 1547 MUST BE APPLIED FOR AS AN ALTERNATIVE SOLUTION TO THE NEW ZEALAND BUILDING CODE CLAUSE G13.**

8. **IF THE TOTAL DOMESTIC WASTE WATER FLOW DESIGN ALLOWANCES ARE TO BE REDUCED FROM THE STANDARD QUANTITIES, THEN ITEMIZATION OF THE WATER REDUCTION FIXTURES WITHIN THE DWELLING WILL BE REQUIRED TO BE SHOWN AS PART OF THE APPLICATION, NOT JUST GENERIC REFERENCE.**

9. **PLEASE USE NZS 1547 IN CONJUNCTION WITH THIS FORM TO SUPPLY AN ACCURATE DESIGN. THE TABLES SUPPLIED ARE A GUIDE ONLY. OTHER SITE CONSTRAINTS MAY INDICATE ALTERNATIVE SYSTEMS ARE REQUIRED, OR THAT A SPECIALIST WASTE WATER ENGINEER BE EMPLOYED.**

10. **PLEASE USE THE BLANK CALCULATIONS SHEET AT THE REAR OF THIS FORM TO SHOW CALCULATIONS FOR SYSTEMS OTHER THAN TRENCHES AND BEDS.**

**11. IT IS NOT ACCEPTABLE TO LEAVE QUESTIONS ON THIS FORM BLANK. IF THE INFORMATION IS NOT KNOWN THEN JUSTIFICATION FOR WHY NOT MUST BE SUPPLIED E.G. WINTER HIGH WATER TABLE ETC.**

# APPENDIX 4.2D

## TYPICAL DOMESTIC-WASTEWATER FLOW DESIGN ALLOWANCES

(Informative)

| Source | Typical wastewater flow allowance in L/person/day (see Note 1) | |
|---|---|---|
| | On-site roof water tank supply | Reticulated community or a bore-water supply |
| Households with standard fixtures (including automatic washing machine) | 140 | 180 |
| Households with standard water reduction fixtures (see Note 2) | 115 | 145 |
| Households with full water-reduction facilities (see Note 3) | 80 | 110 |
| Households with extra wastewater producing facilities | 170 | 220 |
| Households (blackwater only) | 50 | 60 |
| Households (greywater only) | 90 | 120 |
| Motels/hotels | | |
| - guests, resident staff | 140 | 180 |
| - non-resident staff | 30 | 40 |
| - reception rooms | 20 | 30 |
| - bar trade (per customer) | 20 | 25 |
| - restaurant (per diner) | 20 | 30 |
| Community halls | | |
| - banqueting | 20 | 30 |
| - meetings | 10 | 15 |
| Restaurants (per diner) | | |
| - dinner | 20 | 30 |
| - lunch | 15 | 25 |
| Tea rooms (per customer) | | |
| - without restroom facilities | 10 | 15 |
| - with restroom facilities | 15 | 25 |
| School (pupils plus staff) | 30 | 40 |
| Rural factories, shopping centres | 30 | 50 |
| Camping grounds | | |
| - fully serviced | 100 | 130 |
| - recreation areas | 50 | 65 |

NOTES:

1 These flows are minimum rates unless actual flows from past experience can be demonstrated.

2 Standard water-reduction fixtures include dual flush 11/5.5 litre water closets, shower-flow restrictors, aerator faucets (taps) and water-conserving automatic washing machines.

3 Full water-reduction fixtures include the combined use of reduced flush 6/3 litre water closets, shower-flow restrictors, aerator faucets, front-load washing machines and flow/pressure control valves on all water-use outlets. Additionally, water reduction may be achieved by treatment of greywater and recycling for water closet flushing (reclaimed water cycling).

## TABLE 4.2A2
## RECOMMENDED ETA/ETS DESIGN LOADING RATES

| Soil category | Soil texture | Structure | Indicative permeability ($K_{sat}$) (m/d) (see Note 3) | Design loading rate (DLR) (see Notes 1 & 2)<br>ETA/ETS Beds/trenches (mm/d) (see Note 4) | Indicative drainage class (see Note 5) |
|---|---|---|---|---|---|
| 1 | Gravels and sands | Structureless<br>(Massive) | >3.0 | –<br>(see Note 6) | Rapidly drained |
| 2 | Sandy loams | Weakly structured | > 3.0 | –<br>(see Note 6) | Well drained |
| | | Massive | 1.4 – 3.0 | – | |
| 3 | Loams | High/moderate structured | 1.5 – 3.0 | –<br>(see Note 6) | Moderately well drained |
| | | Weakly structured or massive | 0.5 – 1.5 | – | |
| 4 | Clay loams | High/moderate structured | 0.5 – 1.5 | 12 | Imperfectly drained |
| | | Weakly structured | 0.12 – 0.5 | 8 | |
| | | Massive | 0.06 – 0.12 | 5 | |
| 5 | Light clays | Strongly structured | 0.12 – 0.5 | 8 | Poorly drained |
| | | Moderately structured | 0.06 – 0.12 | 5 | |
| | | Weakly structured or massive | < 0.06 | 5 | |
| 6 | Medium to heavy clays | Strongly structured | 0.06 – 0.5 | 5 | Very poorly drained |
| | | Moderately structured | < 0.06 | 5 | |
| | | Weakly structured or massive | < 0.06 | 5 | |

NOTES:

1 The relevant qualifications regarding the use of trenches and beds in Table 4.2A1 are applicable for ETA/ETS systems (see Notes 1, 2 and 4 to Table 4.2A1).

2 The Design Loading Rates in Table 4.2A2 are based upon the best available information at the time of preparation of this Standard.

3 The values of indicative permeability as $K_{sat}$ are based on the movement of water, and not effluent, through the soil. They are estimates only and shall be used with caution in the determination of soil category and DLR.

4 Water-balance calculations could change these figures.

5 Indicative drainage classes listed are based on the assumption that drainage of water out of the soil is governed only by the indicative permeability and that external factors play no role.

6 ETA/ETS systems are not normally used on Soil Categories 1 to 3.

## 4.2A9 MOUNDS

The information given in this section is based on the Wisconsin Mound system (see Figure 4.5B1).

### 4.2A9.1 General

Mounds are normally used on relatively flat slopes that have site or soil restrictions. The restrictions may be:

(a) A shallow layer (300 mm to 600 mm) of soil overlying a limiting layer such as rock, hardpan or high water-table;

(b) Slowly permeable soils;

(c) Freely permeable soils, e.g. rapidly or well drained soils or land-fill areas, where conventional systems should not be used.

The mound is constructed directly onto the natural ground surface, which is ploughed beforehand. Primary treated effluent is dose-loaded into the mound with treatment primarily taking place within the sand-fill of the mound. The effluent discharges directly into the underlying soil.

### 4.2A9.2 Design

**4.2A9.2.1** *Sizing*

Mounds shall be sized according to the loading rate for sand-fill, on the underlying soil basal-area, and when slopes are involved, on the vertical or horizontal linear loading rate of the soil below the toe area of the mound (see 4.2A9.2.2).

The size of the basal area, which is that area beneath and down-slope of the distribution bed, shall be calculated using the DLR for the soil as given in Table 4.2A3.

On slopes, the system shall be extended along the contour to control the linear loading rate. When experience shows the linear loading rate (parallel to the contour) is inadequate to prevent breakout of effluent occurring from time to time, then the mound shall be designed with a toe extension that will increase the available surface area of the parent soil for soakage.

> ***Comment.*** *Slopes up to 1 in 6.7 (15 %) can accommodate a mound design. On slopes, the construction of the mound is configured differently resulting in a different base area to that for flat land to prevent seepage emerging at the toe of the fill and minimize the amount of fill. Specialist advice may be required.*

**4.2A9.2.2** *Loading rates*

Sand-fill which meets the specification provided in 4.5B3.4.2, shall be dose-loaded at a rate not greater than 50 mm/day.

Where the flow of effluent in the soil beneath the toe of the mound is primarily horizontal, i.e. a limiting layer is present, then the linear loading rate shall not be greater than 50 L/m/day.

Where the flow of effluent in the soil beneath the toe of the mound is primarily vertical, i.e. in freely draining soils, then the linear loading rate shall not be greater than 125 L/m/day.

### 4.2A9.3 Construction

Construction details are covered in Clause 4.5 and Appendix 4.5B of this Standard.

## TABLE 4.2A3
## RECOMMENDED MOUND DESIGN LOADING RATES

| Soil category | Soil texture | Structure | Indicative permeability ($K_{sat}$) (m/d) (see Note 2) | Design loading rate (DLR) (see Note 1) Mounds (basal area) (mm/d) (see Note 3) | Indicative drainage class (see Note 4) |
|---|---|---|---|---|---|
| 1 | Gravels and sands | Structureless Massive | >3.0 | 32 | Rapidly drained |
| 2 | Sandy loams | Weakly structured | > 3.0 | 24 | Well drained |
| | | Massive | 1.4 – 3.0 | 24 | |
| 3 | Loams | High/moderately structured | 1.5 – 3.0 | 24 | Moderately well drained |
| | | Weakly structured or massive | 0.5 – 1.5 | 16 | |
| 4 | Clay loams | High/moderately structured | 0.5 – 1.5 | 16 | Imperfectly drained |
| | | Weakly structured | 0.12 – 0.5 | 8 | |
| | | Massive | 0.06 – 0.12 | (see Note 5) | |
| 5 | Light clays | Strongly structured | 0.12 – 0.5 | 8 | Poorly drained |
| | | Moderately structured | 0.06 – 0.12 | (see Note 5) | |
| | | Weakly structured or massive | < 0.06 | (see Note 5) | |
| 6 | Medium to heavy clays | Strongly structured | 0.06 – 0.5 | (see Note 5) | Very poorly drained |
| | | Moderately structured | < 0.06 | (see Note 5) | |
| | | Weakly structured or massive | < 0.06 | (see Note 5) | |

NOTES:

1 The Design Loading Rates in Table 4.2A3 are based upon the best available information at the time of preparation of this Standard.

2 The values of indicative permeability as $K_{sat}$ are based on the movement of water, and not effluent, through the soil. They are estimates only and should be used with caution in the determination of soil category and Design Loading Rate.

3 Where a mound is used at a site without a limiting horizon the loading rates for secondary-treated effluent given in Table 4.2A1 may be used subject to Note 8 of that table.

4 Indicative drainage classes listed are based on the assumption that drainage of water out of the soil is governed only by the indicative permeability and that external factors play no role.

5 The relevant qualifications regarding the use of trenches and beds in Table 4.2A1 are applicable for mound systems. Specifically, note 11 of Table 4.2A1 should be read in conjunction with the use of mounds on soils in Categories 4, 5 and 6.

TABLE 4.2A4
RECOMMENDED DESIGN IRRIGATION RATE (DIR) FOR IRRIGATION SYSTEMS

| Soil category | Soil texture | Structure | Indicative permeability ($K_{sat}$) (m/d) (see Note 1) | Design irrigation rate (DIR) (mm/week) (see Notes 2 & 3) | Indicative drainage class (see Note 4) |
|---|---|---|---|---|---|
| 1 | Gravels and sands | Structureless Massive | >3.0 | 35 | Rapidly drained |
| 2 | Sandy loams | Weakly structured | > 3.0 | 35 | Well drained |
| | | Massive | 1.4 – 3.0 | 35 | |
| 3 | Loams | High/moderately structured | 1.5 – 3.0 | 28 | Moderately well drained |
| | | Weakly structured or massive | 0.5 – 1.5 | 28 | |
| 4 | Clay loams | High/moderately structured | 0.5 – 1.5 | 25 | Imperfectly drained |
| | | Weakly structured | 0.12 – 0.5 | 25 | |
| | | Massive | 0.06 – 0.12 | 25 | |
| 5 | Light clays | Strongly structured | 0.12 – 0.5 | 20 | Poorly drained |
| | | Moderately structured | 0.06 – 0.12 | 20 | |
| | | Weakly structured or massive | < 0.06 | 20 | |
| 6 | Medium to heavy clays | Strongly structured | 0.06 – 0.5 | 15 | Very poorly drained |
| | | Moderately structured | < 0.06 | 15 | |
| | | Weakly structured or massive | < 0.06 | 15 | |

NOTES:

1 The values of indicative permeability as $K_{sat}$ are based on the movement of water, and not effluent through the soil. They are estimates only and should be used with caution in determining soil category and Design Loading Rates.

2 The relevant qualifications regarding the use of trenches and beds in Table 4.2A1 are applicable for irrigation systems.

3 The Design Irrigation Rates in Table 4.2A4 are based on the best available information at the time of preparation of this Standard.

4 Indicative drainage classes listed are based on the assumption that drainage of water out of the soil is governed only by the indicative permeability and that external factors play no role.

**CALCULATION SHEET FOR ETA/ETS, MOUNDS, SUB-SURFACE AND SURFACE IRRIGATION SYSTEMS:**

**TYPE OF SYSTEM BEST SUITED-____________________________**

**TYPE OF SOIL-(CATEGORY)-_______________**

**DLR or DIR FROM TABLES-_________________**

**NUMBER OF BEDROOMS-___________________**

**OCCUPANTS-_______________**

**TOTAL LITRES PER DAY-___________________**

**SIZE OF FIELD REQUIRED $M^2$-______________**

**SIZE OF RESERVE AREA REQUIRED (SEE NZS 1547)-______________**

**WATER SAVING DEVICES (SEE NOTES IN TABLES):**

____________________________________________________________

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# CROSS SECTIONAL CONSTRUCTION DETAILS OF FIELD

**ACCURATE SITE PLAN INCLUDING RESERVE AREAS, DATUM HEIGHTS TO SHOW SURFACE WATER FLOW PATHS WHERE APPLICABLE AND OTHER SITE CONSTRAINTS e.g(WATER COURSES ETC)**