Government of South Australia
Department of Health

WASTEWATER NEWS

A Newsletter for Local Council Officers & Wastewater Practitioners
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WELCOME

Welcome to the September 2007 edition of *Wastewater News*. You can find an electronic version of this document on our website: www.dh.sa.gov.au/pehs/newsletters.htm#wastewater

Office Move

Please note that we have now completed our move to Citi Centre Building, 11-13 Hindmarsh Square (above the Credit Union). If you are attending a meeting within the building it would be appreciated if you could arrive at the appointed time as there are a number of meeting rooms and staff will have to be provided to escort attendees to the relevant area.

All telephone numbers, email addresses and our postal address are the same.

Legislation Update

Update of the Codes is progressing. We are presently working through submissions and administrative issues associated with the introduction of the documents.

Copies of the draft Codes and Regulations are downloadable from our website at: www.dh.sa.gov.au/pehs/branches/wastewater/draft-connection-code.htm

Wastewater Treatment System New Product Approvals

The new wastewater products approved for installation in South Australia are:

Aquarius Domestic Greywater Diversion Device:

This greywater diversion system accepts greywater from shower, bathroom tap, laundry and washing machine. The excess greywater entering the system gets directed to sewer. It consists of two filters, a 250 L greywater tank and a suitable pump. The system allows plants/lawns to be irrigated via subsurface means. The minimum sub-surface irrigation area would be 80 m^2.

Grey Flow Grey Water Reuse System Models 00 and US:

These greywater diversion systems accept greywater from the shower, bathroom tap, laundry and washing machine. The excess greywater entering the systems gets diverted to sewer. The systems' main components are two filters, an underground pit for 00 Model and a suitable pump. The systems allow plants/lawns to be irrigated via subsurface means. The minimum sub-surface irrigation area would be 80 m^2.

Biocycle Model 40 Aerated Wastewater Treatment System:

This is a 40 EP all wastewater system approved for a hydraulic load of 6000 L/day and organic load of 2000 g/day. The system consists of four 8000 L capacity and one 500 L capacity upright cylindrical concrete tanks.

Ozzi Kleen Aerated Wastewater Treatment System Model RP 35:

This is a 35 EP all wastewater system approved for a hydraulic load of 7000 L/day and organic load of 2450 g/day. The system consists of a series of poly tanks having dimensions of 14,000 L, 5,000 L, 700 L and 350 L.

Ozzi Kleen Aerated Wastewater Treatment System Model RP 50:

This is a 50 EP all wastewater system approved for a hydraulic load of 10,000 L/day and organic load of 3,500 g/day. The system consists of a series of poly tanks having dimensions of 18,500 L, 5,000 L, 700 L and 350 L.

Building Rules, Reactive Soils and Flexible Joints

The following article appeared in the July-August Edition of Plumbing SA and is reprinted with the kind permission of John Goldfinch, FMG Consulting, and the Plumbing Industry Association. We believe that all EHOs carrying out plumbing inspections will be interested in the issues raised below.

Just as we have come to accept location, location, location as being the mantra when buying a house, then just as surely it can be said that legislation, legislation, legislation is the equivalent when building a house. Those of us licensed to carry out building work will already be aware of the constantly changing minefield of legislation governing building work practices in the State of South Australia. It is no longer the case that plumbers need only be aware of all things pertaining to just their trade, such as water, waste water, fittings, fixtures and all of their respective installation procedures.

Plumbers also need to be well versed in the nuances of the many Codes and Standards that

are ancillary to conducting business as a Plumbing and Drainage Contractor in this State.

There are various Acts of Parliament in place that are not directly related to plumbing work such as the OHS&W Act and the Building Work Contractors Act 1995 not to mention the more obvious statutory (i.e. legally enforceable) requirements for building work of which all involved in the building and construction industry need to have a thorough working knowledge.

Prior to delving further into the more important subject matter of this article the author sees merit in first revisiting the fundamental legislative "pathway" which ultimately leads to the calling up of the various Australian and New Zealand Standards and Codes of Practice we need to refer to when undertaking building work. The over-riding or controlling legislation in South Australia for all Development Work, including building work, is the Development Act 1993 and its companion volume the Development Regulations 1993.

The Development Act 1993 at Section 4(1) defines "the Building Rules" as being any Codes or Regulations under the Act, including any standard or document adopted by those Codes and Regulations or referred to in those Codes or Regulations.

The Development Regulations at Regulation 4(1) call up the Building Code of Australia ("BCA") as a Code containing the Building Rules. The BCA is published in two volumes. Volume 2 covers Class 1 and 10 buildings (i.e. residential construction) while Volume 1 covers commercial and industrial structures from Classes 2 through to 9 inclusive. The call up of Codes and Standards for reference when doing Development work, including building work, is also mentioned in Sections 108(4)(a) & (b), 108(6)(a), (b) & (c) and 108(8)(a), (b) & (e) of the Development Act 1993. You should carefully read and understand these Sections, especially Section 108(8)(e) which carries significant weight with respect to the importance of Australian or Australian and New Zealand Standards as part of the Building Rules. In effect it says that any Australian Standard or Code has effect as though it itself was a "regulation made under this Act", which the author interprets as meaning all Codes and Standards pertaining to development work including building work, therefore have statutory force in the State of South Australia.

The Development Act 1993 and Development Regulations 1993 can be accessed on the State Government website www.legislation.sa.gov.au then select the letter "D" (it is an alphabetical selection process) and finally select Development Act 1993. This pathway also gives access to the Development Regulations 1993 on the same webpage.

What is called the "relevant day" that heralded the full introduction of the BCA and hence the Building Rules in South Australia was 15 January 1994. The BCA is a performance based and not a prescriptive Code, meaning that "alternative solutions" are permitted that may be considered to achieve what is known as "deemed to satisfy" building solutions with respect to the Objectives, Functional Statements and Performance requirements that are set out within the BCA as part of its structure. One such deemed to satisfy reference document for Volume 2 (residential construction) in South Australia is the South Australian Housing Code ("SAHC") which is published by Planning SA.

The BCA Volume 2 at Part 1.4 contains a schedule of referenced documents (Pt. 1.4.1) which are referred to in the Housing Provisions (i.e. the SAHC). At least three of the referenced standards that need to be read and understood by Plumbers are, AS/NZS3500 Pts. 3, 4 and 5, AS3660 Pts. 1 and 2 (the Termite Management standard for both new and existing buildings) and AS2870 (the Australian Standard for Residential Slabs and Footings – Construction). The termite standard is relevant because Plumbers may need to advise Builders and Owners to retreat areas of a dwelling that may be disturbed by plumbing works carried out subsequent to the initial treatment.

It is AS2870 that is the principal focus of this article. This is the Standard used by suitably qualified engineers to classify building sites and to design footing systems. This Standard places particular emphasis on design for reactive clay sites susceptible to significant ground movement due to moisture changes. It takes into account,

(a) Swelling and shrinkage movements of reactive clays due to moisture changes,

(b) Settlement of compressible soils or fill,

(c) Tolerance of the superstructure to movement, amongst other things.

In a general sense AS2870 only applies to Class 1 and 10 dwellings, but may also apply to some light commercial and industrial structures that are equivalent to houses in terms of size, loading and superstructure flexibility. The Standard requires all sites to be classified with respect to soil movement characteristics. Section 2 of the Standard is relevant in this regard. Stable building sites are

classes A and S while unstable reactive clays belong within the M-D, H-D or E-D classifications. The letters M, H and E stand for moderately, highly and extremely reactive clays, respectively. The letter D stands for deep-seated soil movements characteristic of dry climates (refer to Table 2.1 of AS2870).

In South Australia site classifications are performed by Engineers and can always be found in the Engineer's Site Investigation or Footing Construction Report documents which must accompany all Development Applications when seeking Development Approval from Councils. Once a Plumber knows the site classification he or she can then determine whether or not flexible connections are required for stormwater and waste drains at that site. It is therefore advisable that Plumbers obtain a copy of the Engineer's footing design recommendations for each site before quoting or undertaking any work.

Flexible connections are required for all class H and E sites with references to flexible connections being found in Clauses 5.5.4(b) and 6.6(f) of AS2870. Up to this point in time AS2870 does not define a flexible connection and hence there is no guidance given as to what flexible connections must be capable of achieving when incorporated in a pipework system.

From an Engineer's point of view the author contends that a flexible connection must afford the pipework system sufficient degrees of freedom in both rotation and linear movement (axial and lateral), to mitigate stress accumulation in the system imposed by soil movement at changes in direction of the pipework and otherwise adjacent to solvent welded joint fittings. It is therefore necessary to incorporate such fittings at these positions in any pipework system on class H and E sites.

The selection of an appropriate flexible connection is another important aspect of stormwater and waste drain planning. For example, there is no point electing to use as a flexible connection a fitting that is only capable of remaining competent for some lesser soil movement than that specified by the Engineer for the site. That is to say, a fitting with ± 20 mm movement capability will not be suitable for class H or E sites where movement is predicted to be in excess of 40 mm. A Table showing predicted surface soil movements relative to site classification can be found in Table 2.3 in Section 2 of AS2870. It is reproduced below for convenience.

Table 2.3

Surface Movement	Primary Classification of Site
0mm <ys ≤ 20 mm	S
20 mm <ys ≤ 40 mm	M
40 mm <ys ≤ 70 mm	H
ys> 70 mm	E

Class H soils are those with a characteristic surface movement of between 40 and 70 mm while Class E soils have surface movement potential in excess of 70 mm and possibly as high as 150 mm, especially when tree effects are incorporated in an Engineer's footing design. Some examples of the correct application of flexible connections in the layout of commonly encountered DWV PVC-u pipework systems are shown in Figs. 1 & 2 below. They have been provided to the author by Storm Plastics who manufacture a range of watermarked flexible connections and provide technical advice to users and specifiers.

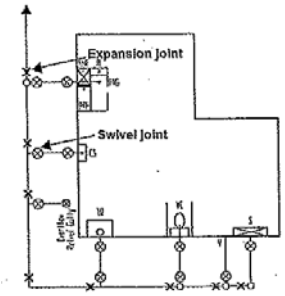

Fig 1: Typical residential site D and E-D reactive soils

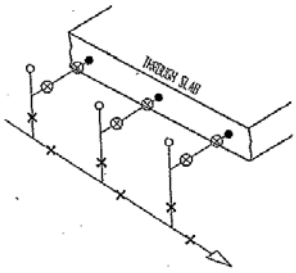

Fig 2: External drain Class H-takeoffs class H-D and E-D reactive soils

Plumbers should also be familiar with service trench requirements as set out in Clauses 6.3 and 6.6(b), (d), (e) and (f) of AS2870. Clause 6.3, or more particularly its sub-note, is included to prevent trenches undermining footings. Clause 6.6 relates to backfill requirements stating that trenches must have a surface filling of wet compacted clay for Class H and E soils.

Finally, it is worth mentioning Sections 45(1) and 45(2) of the Development Act 1993. These Sections of the Act are a concise statement of what is required of any "person" (note not a licensed person so pertains equally to owner/builders) when undertaking building work. It is, in effect, a statement of your statutory obligation as a Plumbing Contractor to perform your work, or to cause it to be performed, in accordance with all "technical details, particulars, plans, drawings and specifications" as approved by Council when granting Provisional Building Rules Consent under the terms and conditions set out in the Act and

Regulations. This is why it is so important for plumbers to peruse the Engineer's footing construction recommendations at least for class H and E sites.

Storm Plastics advocate that 'all PVC-u drainage pipe systems' be treated as being in the worse case scenario, ie, class E-D type soils, as a safeguard should soil conditions vary across a site from that tested. Such would also provide provision for thermal movement and enhance the longevity of the respective pipe system(s).

In conclusion, the author suspects you may now be sufficiently terrified of the veritable minefield of legislation and standards. However, always remember the old adage, to be forewarned is to be forearmed. Avoidance of the possibility of future litigation by adhering to the Building Rules and having a working knowledge of Codes and Standards may save you a considerable sum of money and rework time. Relevant Clauses in AS2870 mentioned in this article are, after all, not difficult to read and interpret in so far as they apply to plumbing and drainage work.

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