

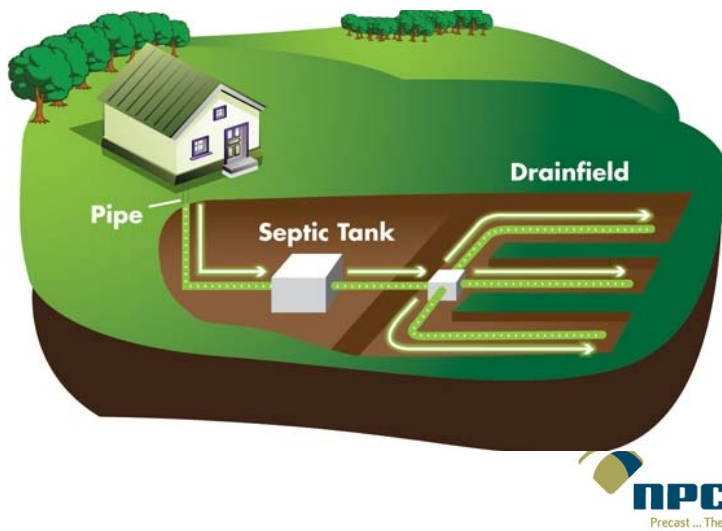
## Septic Tank Lid Safety and Risers

29<sup>th</sup> Annual GSDI Spring Septic System  
Conference & Expo  
Tuesday March 15, 2016

Claude Goguen, PE, LEED AP,  
National Precast Concrete Association



## Wastewater Treatment





## Riser to Grade



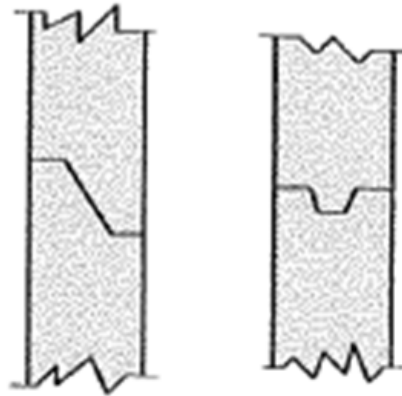
## Watertight System



## Cast In Works Best!!



## Precast Riser Sections



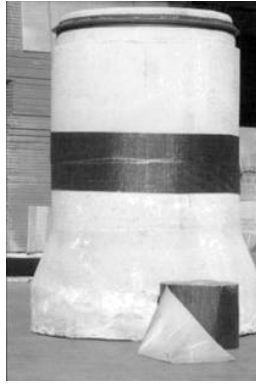
## Joint Sealant Proper Installation



Joint Sealant



## Joint Wrap



## From 410 IAC - 61 (o)(p)

- (o) All access openings shall meet the following requirements:
- (1) At least one (1) opening eighteen (18) inches in minimum dimension per compartment for pumping access.
  - (2) An access opening shall be located over each of the following:
    - (A) The inlet.
    - (B) The outlet.
    - (C) The sanitary tee or baffle, if present, on the partition or divider wall of a two-compartment septic tank.
  - (3) All access openings shall be sized and positioned in such a way as to allow for maintenance, cleaning, and servicing of septic tanks and outlet filters.
- (p) All risers shall meet the following requirements:
- (1) Risers and riser covers shall be made of corrosion resistant materials and withstand design external loads.
  - (2) The lower section of the riser assembly shall be:
    - (A) cast into the tank lid; or
    - (B) sealed to the top of the tank with butyl sealant meeting ASTM C 990-09 to provide a watertight seal.
  - (3) All risers shall be fitted with watertight, securely fastened covers.



# From 410 IAC - 63 (c)

(c) When the top of the septic tank or dosing tank is installed at or above grade, all access openings shall be fitted with watertight, securely fastened covers.



# Avoidable Tragedies

## 2-year-old dies after falling into open septic tank in Fruitland Park

February 6, 2014 By Jerry Falstrom, Orlando Sentinel  
An autopsy on a toddler who died Wednesday after falling into an open septic tank in Fruitland Park determined the cause of death was drowning, police Chief Terry Isaacs said today.  
The accident occurred as friends and relatives helped residents who were moving out, police said.  
"It appears to be a very, very tragic accident," said Isaacs, who didn't immediately release the name or age of the girl because an investigation is ongoing.

## Dix Hills Septic Tank Accident Kills a Father and His Two Sons

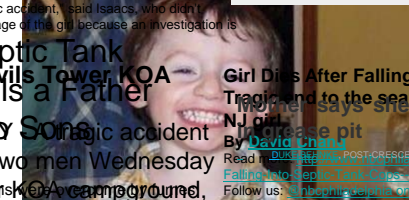
Two men found dead in septic tank  
POLICE MAKE DISCOVERY AFTER WORKERS REPORTED MISSING; OSHA INVESTIGATING  
KENNEBUNKPORT, Maine — Two septic workers were found dead in an underground sewage tank at the Lodge at Turbat's Creek in Kennebunkport on Tuesday morning, prompting an investigation into the accident.  
SEACASTONLINE.COM  
BY JENNIFER FEALS  
POSTED SEP. 28, 2011 @ 2:00 AM

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## Girl Dies After Falling Into Septic Tank

Tragic incident to the search for a missing Lakewood, NJ girl  
By David Chen  
Read more at [www.post-crescent.com/news/local/Child-Dies-After-Falling-Into-Septic-Tank-Links-142407885.html#xzz303ITCsIX](http://www.post-crescent.com/news/local/Child-Dies-After-Falling-Into-Septic-Tank-Links-142407885.html#xzz303ITCsIX)  
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## Cost

Expense	Amount USD
Lawsuit	\$1.1M (Parents of 3-year old involved in a fatal accident are currently in court with the homeowners.)
Medical Bills	\$5,406+ (Num. cited from a 2001 case)
Veterinary Bills	Walk in fee alone is \$70 - \$100 (According to city-data)
Fatality	\$5,000+ (Funeral Arrangements) Invaluable life

VS

**\$50.00 for a lid. \$25 for a safety net**



## Emphasis on Tank Access

- **Regulators pushing to have tanks pumped regularly**
- **Access to outlet effluent filters necessary**
- **Access to effluent pump stations required**
- **Extension of water tight manhole risers to grade required to facilitate servicing**
- ***Tank manhole extensions and lids can be a safety hazard if not designed and installed properly***





## Proper Tank Manhole & Lid Design

- **Must be effective in providing access to tank**
- **Sometimes required to be cast into or otherwise attached to tank while eliminating groundwater infiltration**
- **Lid should be structurally designed for anticipated loads (cast iron for roads/driveways, plastic for lawns/yards)**
- **Easily removable by adults but impossible to remove by very young children**
- **Employ one or more safety features to prevent accidental access by unauthorized persons**



## ASTM C1227

- **7. Physical Design Requirements**
  - 7.6 Openings in Top Slab:
    - 7.6.1 An access opening shall be located over the influent pipe and the effluent pipe. Where an opening has any dimension greater than 12 in. (300 mm), the lid shall weigh a minimum of 59 lb (27 kg) or be provided with a lock system to prevent unauthorized entrance.
    - 7.6.6 Where covers are flush with or above ground, they shall be provided with a lock system to prevent unauthorized entrance.
- **13. Product Marketing**
  - 13.3 Where an access opening or an inspection opening has a dimension greater than 8 in (200 mm), a label of noncorrosive material shall be placed in a prominent place to warn everyone that “Entrance into the tank could be fatal.”



## NPCA Best Practices Manual

### Openings in Top Slab: Access Risers and Manholes

All access risers and manholes must be structurally sound and watertight. An access opening should be located over the influent pipe and the effluent pipe.

Where an opening has any dimension greater than 12 inches (300 mm), the concrete lid should weigh a minimum of 59 pounds (27 kg) or be fitted with a lock system to prevent unauthorized entrance for materials other than concrete. Where access covers or lids are installed at grade, a secondary safety apparatus should be used in the event the cover is removed and not correctly secured. An access opening or openings shall be provided to permit pumping of all compartments.

Handles should be provided when the top of a cover is flush with the top of the top slab. Handles must be made of corrosion-resistant material and be capable of supporting the weight of the cover.



## Options

- Secondary tank lids
- Safety screens or similar devices
- Riser safety locks
- Tamper resistant riser cover screws



## Common Lid Safety Attachment Methods

- **ASTM requires lids to weigh 59 LBS or be provided with a locking system**
- **Double safety of heavy concrete lid with mechanical attachment of plastic lid**

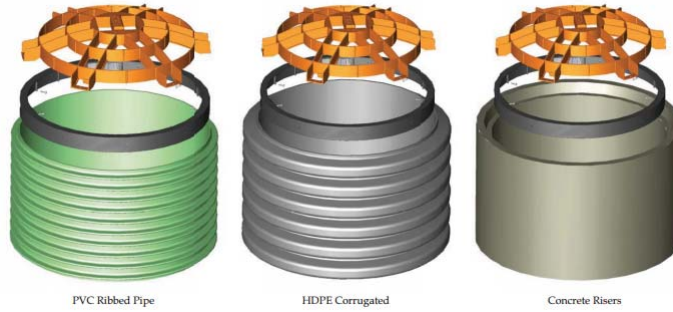


## Common Lid Safety Attachment Methods

- **Several manufacturers have created an interior safety mechanism to prevent unwanted tank entry.**
- **Some are plastic, rope, metal, etc.**



## Secondary Apparatus



PVC Ribbed Pipe

HDPE Corrugated

Concrete Risers



## Netting



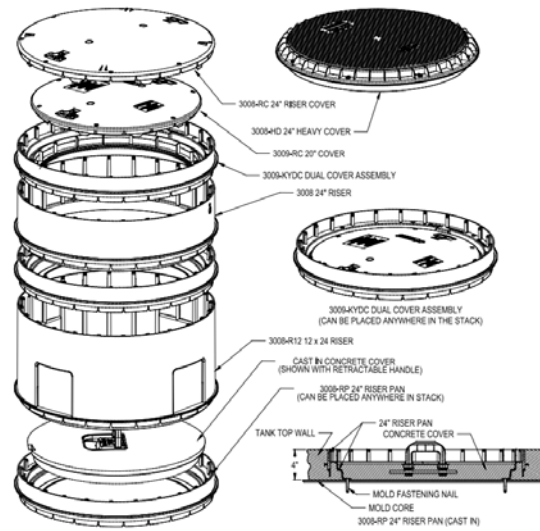
Precast ... The Concrete Solution

# Grating





## Secondary Apparatus





### Common Lid Safety Attachment Methods

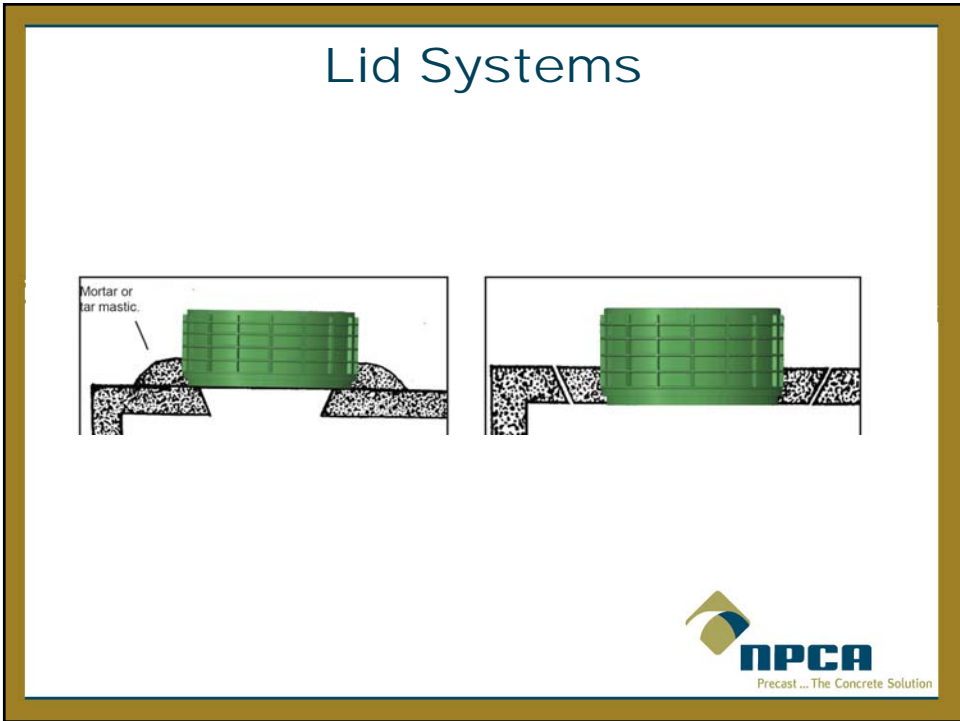
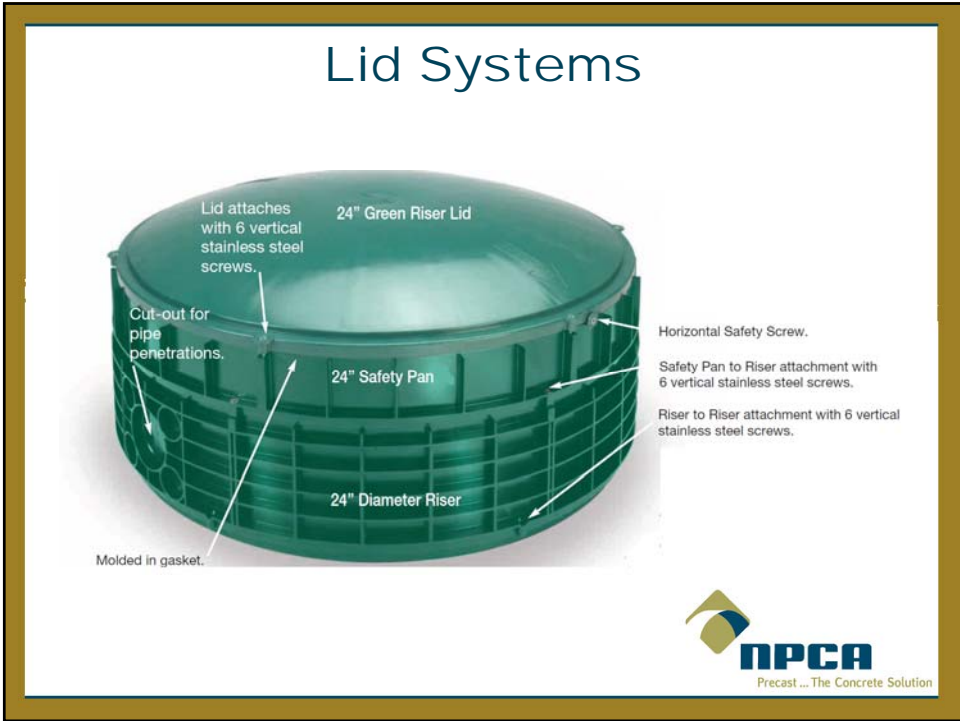
- **Physical device using a lock & key**
- **Multiple covers to prevent unwanted access**
- **A combination of multiple screws/bolts with non-standard screw/bolt heads**



The image shows two examples of lid safety attachment methods. The top image shows a green lid with a silver lock and a key. The bottom image shows a green lid with several screws.



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## Access Lid



## What Can We Do to Promote Safe Tanks and Lids?

- **More stringent rules and regulations**
- **Tank manufacturers should provide secure system**
- **Homeowner education**
- **Maintenance providers – first line of defense against another tragedy**



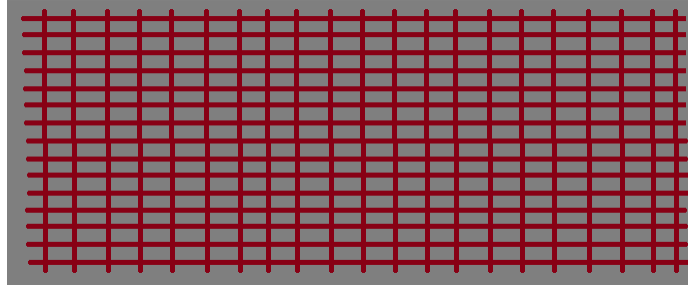
Life sometimes requires modifications



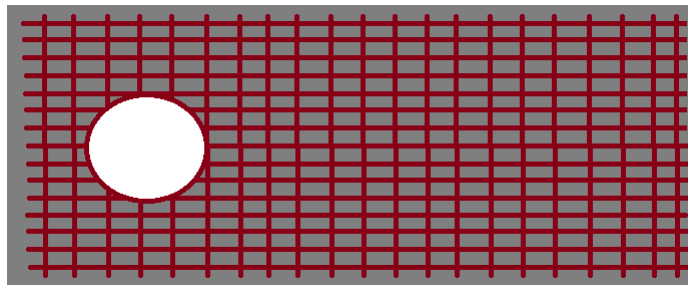
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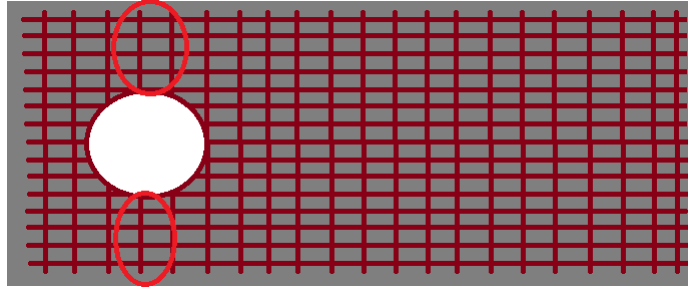
## Lid Design



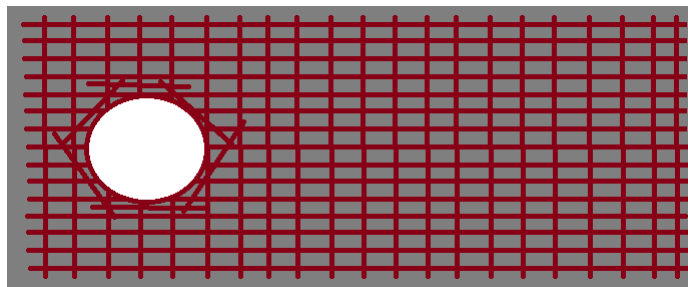
## Lid Design



## Lid Design



## Lid Design



## Summary

- **Cast in riser works best for watertightness and structural integrity**
- **Proper application of butyl and wrapping crucial**
- **Safe access points – Regulations, Homeowner Education, Inspections, Maintenance Providers**
- **Precast lids are designed to withstand loading. Cutting lid can compromise that ability.**
- **And...**



## One last thing...

**Rely on your local producer**



**NPCA**  
Precast ... The Concrete Solution

## Additional Information & Resources

### Septic Tank Best Practices Manual

<http://precast.org/precast-possibilities/products/water-and-wastewater-products/>

NPCA website

<http://precast.org/>



## Questions?

- **If you have any questions about this presentation or anything about precast concrete onsite wastewater structures, please contact:**

**Claude Goguen, PE, LEED AP**

NPCA

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Web: [www.precast.org](http://www.precast.org)



**THANK YOU!**



**Septic Tank Lid Safety and Risers**

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