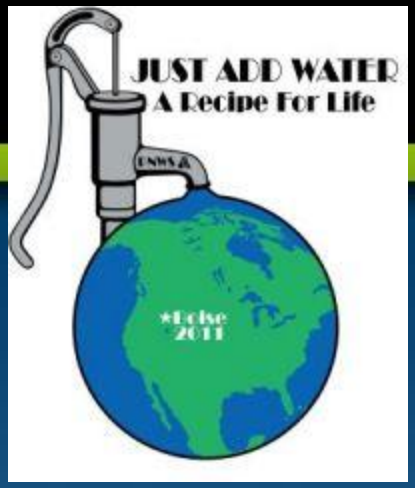

Jennifer Garbely

WATERPROOFING SYSTEMS

to protect your Reservoir

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Today's Discussion

- Study Background
- Waterproofing Systems
  - Rubberized Asphalt Membrane
  - Coating
  - Spray Membrane
  - Rolled, Self-adhering Membrane
  - HDPE Liner
- Product Analysis
- Cost Analysis
- Conclusions

Study Background

Portland Water Bureau

Powell Butte Buried 50 MG concrete reservoir

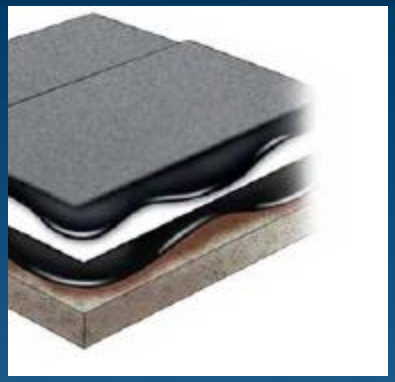
“Contractors prescription all waterproofing systems are the same”

Tasked to recommend a waterproofing system

Waterproofing Systems

1. Rubberized Asphalt Membrane – Hydotech MM 6125
2. Coating – Futura-Thane 5360
3. Spray Membrane & Sheet – WR Grace Procor Composite
4. Rolled, Self-adhering Membrane – WR Meadows MEL-TOL
5. HDPE Liner – GSE HD Geomembrane

Rubberized Asphalt Membrane



- The Monolithic Membrane 6125 Fabric Reinforced Assembly
  - One coat of membrane at 90 mils
  - Hydrotech's Flex Flash F (a spunbonded polyester fabric)
  - A second coat of membrane at 125 mils
  - Total membrane thickness is 215 mils

- A thermoplastic material - one component, 100% solids
  - *no solvents means no on-site cure failures*
  - *no two part mixing*
  - *no VOC restrictions*

- Conforms to all surface irregularities and bonds to an acceptable substrate
  - i.e., concrete, steel, wood, etc. eliminating lateral migration of water

- Completely monolithic - *no seams*

- Can be applied horizontally or vertically

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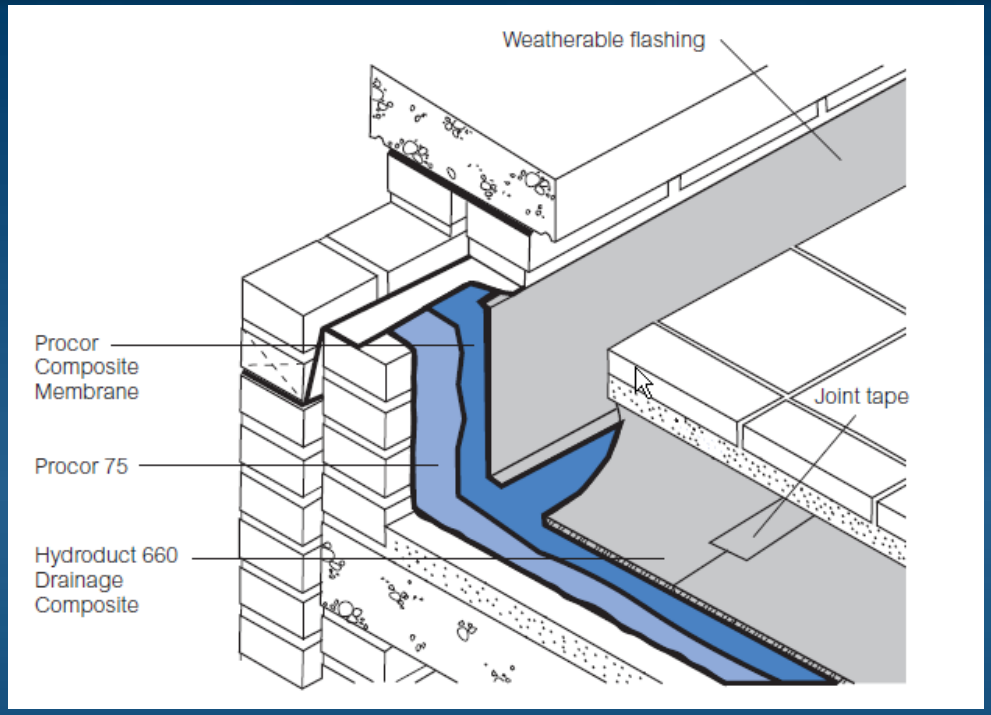
Coating

- Futura-Thane 5360
  - 100% solids
  - Fast set
  - Structural polyurea
- Strong structural characteristics
  - Allow it to be applied over weak surfaces where other coatings may not be applied
- Formulation allows for applications
  - Low temperatures
  - High humidity
  - Certain damp surfaces
- Applied using heated plural component spray equipment

Spray Membrane & Sheet

- Procor® Composite
  - Procor 75 fluid-applied membrane
  - Procor® Composite sheet membrane



- Procor 75 is spray applied
  - After the desired thickness is attained
- Composite sheet membrane
  - Applied to the wet Procor 75

- Provides a durable and integrated system for use in vertical and horizontal waterproofing applications

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Rolled, Self-adhering Membrane

- MEL-ROL® waterproofing system - a roll type membrane
  - Flexible
  - Versatile
  - Dependable

- Membrane composed
  - 56 mil thick layer of polymeric
  - 4 mil thick cross-laminated polyethylene carrier film

- These two components are laminated together under strict quality controlled production procedures

- Positive waterproofing protection against damaging moisture migration and the infiltration of free water

- Can be installed for vertical and horizontal waterproofing applications

HDPE Liner

GSE textured geomembranes.

- GSE HD geomembrane
  - High density polytheylene (HDPE) liner
- The waterproofing system
  - Rolled out
  - Seams are fused together
- The GSE HD is available in single or double-sided textured geomembrane and the possibility of a conductive upper surface
- Outstanding stress crack resistance from resins designed to resistance to stress cracking
- Can be installed for vertical and horizontal waterproofing applications

Product Analysis

Evaluation Parameters:

- Weather Conditions for Installation
- Installer
- Cure Period
- Length of Product Time in the Field
- Weight of Product Impact
- Seismic Durability
- Warranty
- NSF Certified
- Product Thickness
- Material Cost

Weather Conditions for Installation

Waterproofing System	Weather Conditions for Installation
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	Can be installed at temperatures as low as 0 °F *(provided the substrate is clean, dry, free of snow and frost).*
Futura-Thane 5360 – Futura (Coating)	Surface may be damp
ProCor Composite – WR Grace (Spray Membrane & Sheet)	Surface may be damp
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	Surface required to be dry
GSE HD Geomembrane – GSE (HDPE Liner)	Surface needs to be clean, smooth and dry

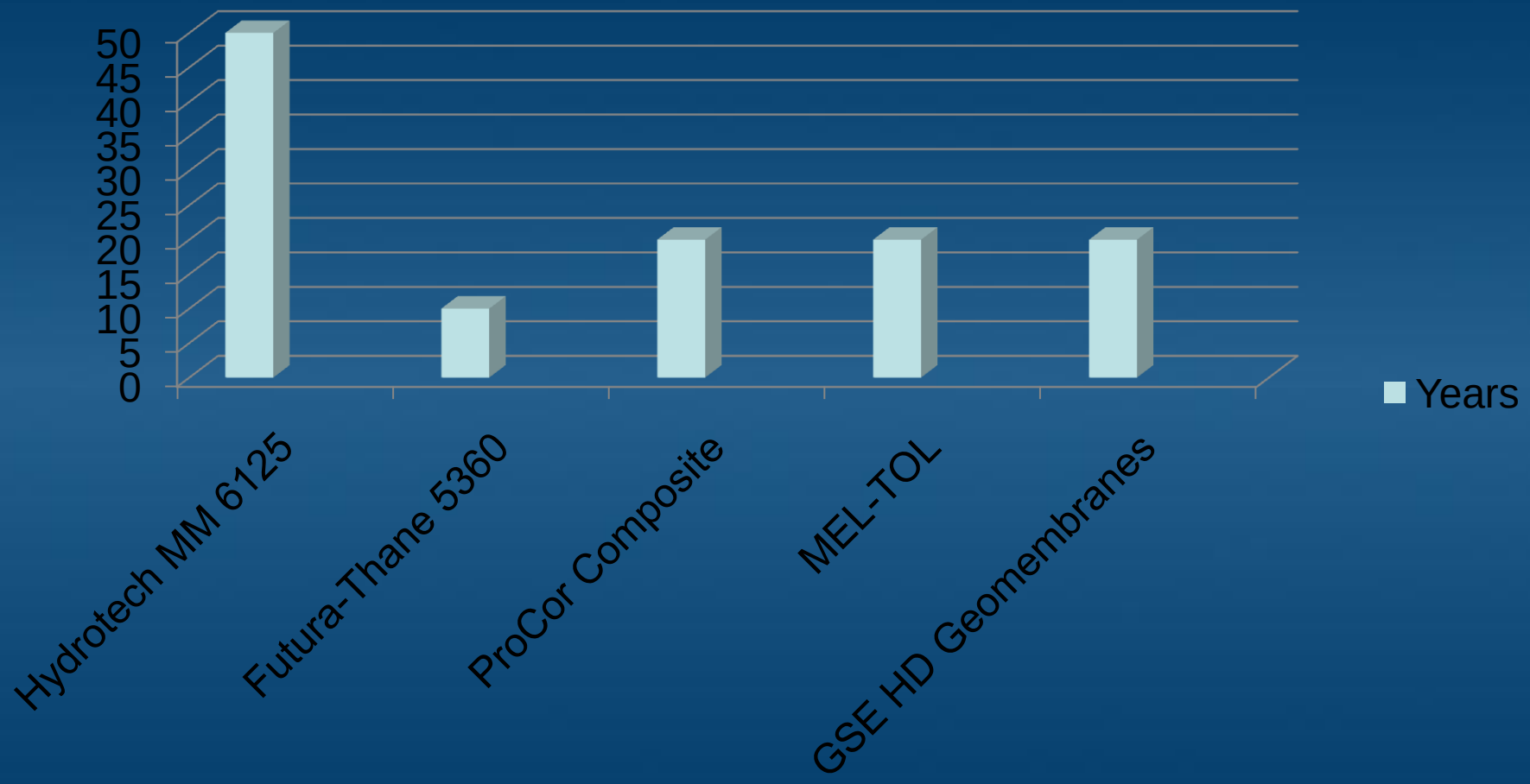
Installer

Waterproofing System	Installer
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	Provide material and an approved contractor installs
Futura-Thane 5360 – Futura (Coating)	Provide material and an approved contractor installs
ProCor Composite – WR Grace (Spray Membrane & Sheet)	Provide material and an approved contractor installs
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	Provide material and an approved contractor installs
GSE HD Geomembrane – GSE (HDPE Liner)	Provide material and an approved contractor installs

Cure Period

Waterproofing System	Cure Period
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	No curing period, use 100% solids, after applied the material may begin next step
Futura-Thane 5360 – Futura (Coating)	20 min cure period
ProCor Composite – WR Grace (Spray Membrane & Sheet)	No curing period when using the Procor Composite system
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	No curing period and prefer to start next step right away
GSE HD Geomembrane – GSE (HDPE Liner)	No curing period

Length of Product Time in the Field



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Weight of Product Impact

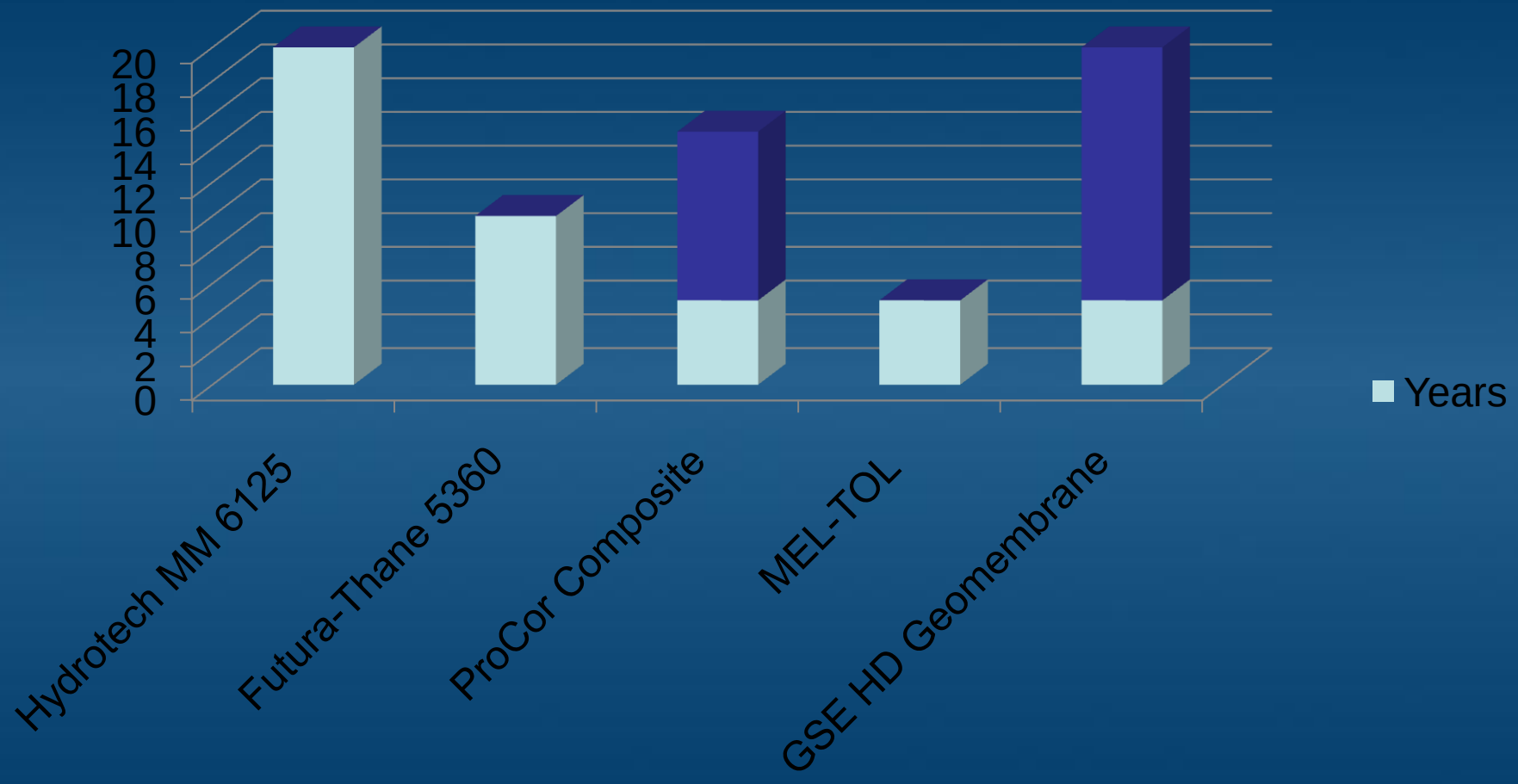
Waterproofing System	Weight of Product Impact
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	Not Significant
Futura-Thane 5360 – Futura (Coating)	Not Significant
ProCor Composite – WR Grace (Spray Membrane & Sheet)	Not Significant
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	Not Significant
GSE HD Geomembrane – GSE (HDPE Liner)	Not Significant

Seismic Durability

Waterproofing System	Seismic Durability
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	Flexible membrane that does not get hard
Futura-Thane 5360 – Futura (Coating)	Forms a hard coating
ProCor Composite – WR Grace (Spray Membrane & Sheet)	Forms a hard rubber with some flexibility
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	Flexible, applied material
GSE HD Geomembrane – GSE (HDPE Liner)	Flexible, applied material

Note: No manufacture performs seismic testing at this time

Warranty



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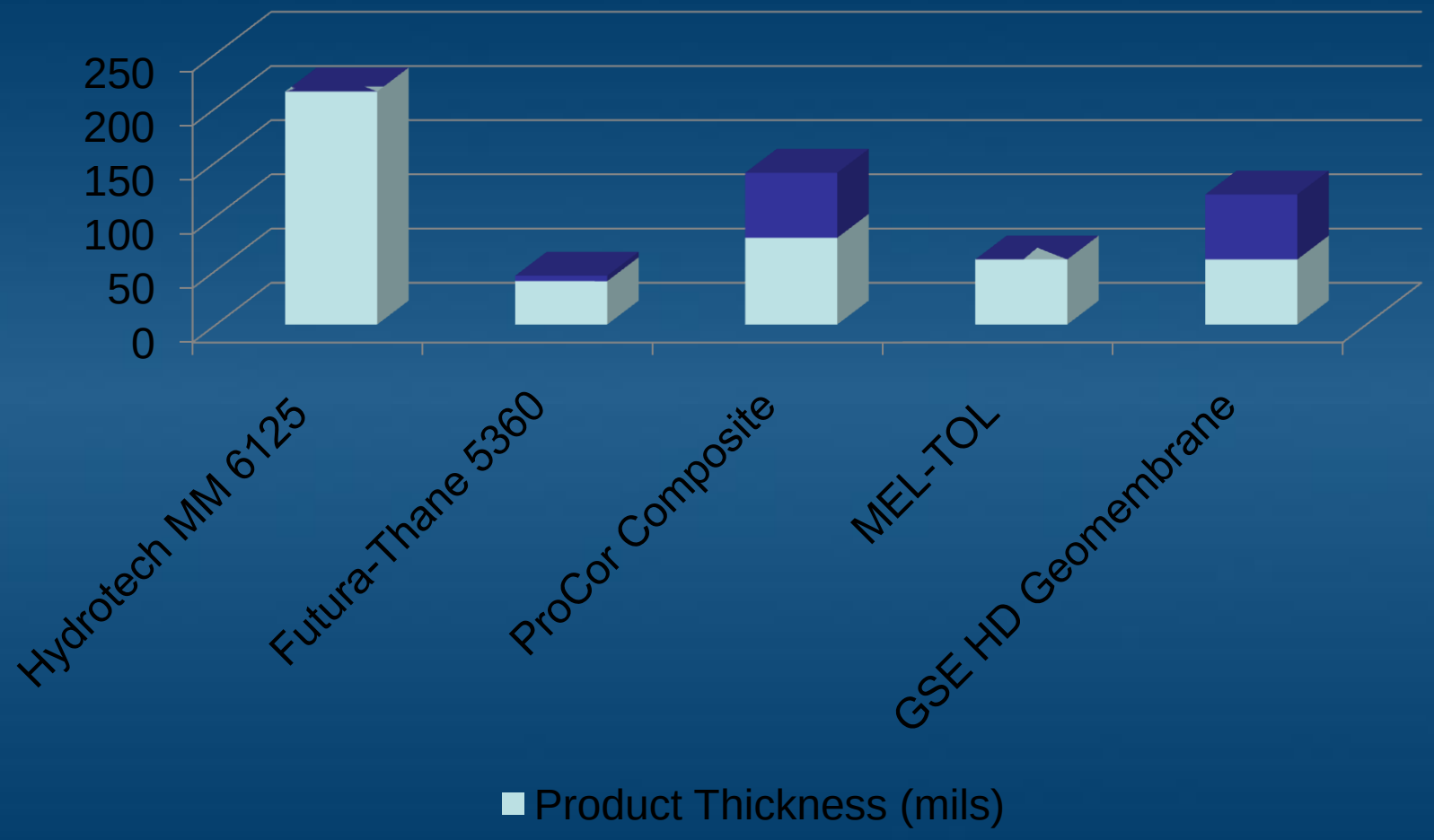
NSF Certified

Waterproofing System	NSF Certified
Hydrotech (MM 6125) - Rubberized Asphalt Membrane	No
Futura-Thane 5360 – Futura (Coating)	No
ProCor Composite – WR Grace (Spray Membrane & Sheet)	Yes
MEL-TOL – WR Meadows (Rolled, Self-adhering Membrane)	No
GSE HD Geomembrane – GSE (HDPE Liner)	Can be provided

Product Thickness



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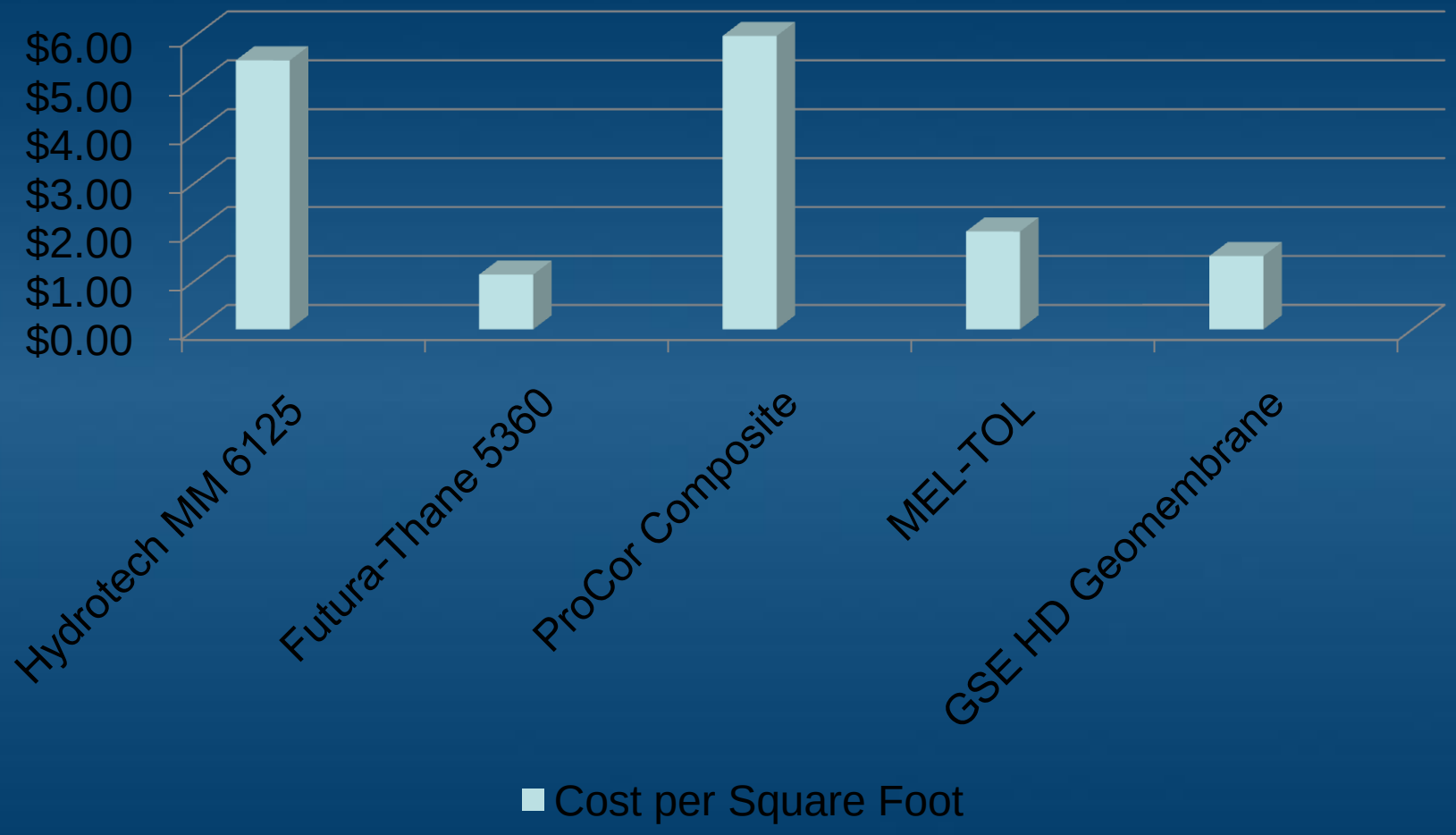
Material Cost



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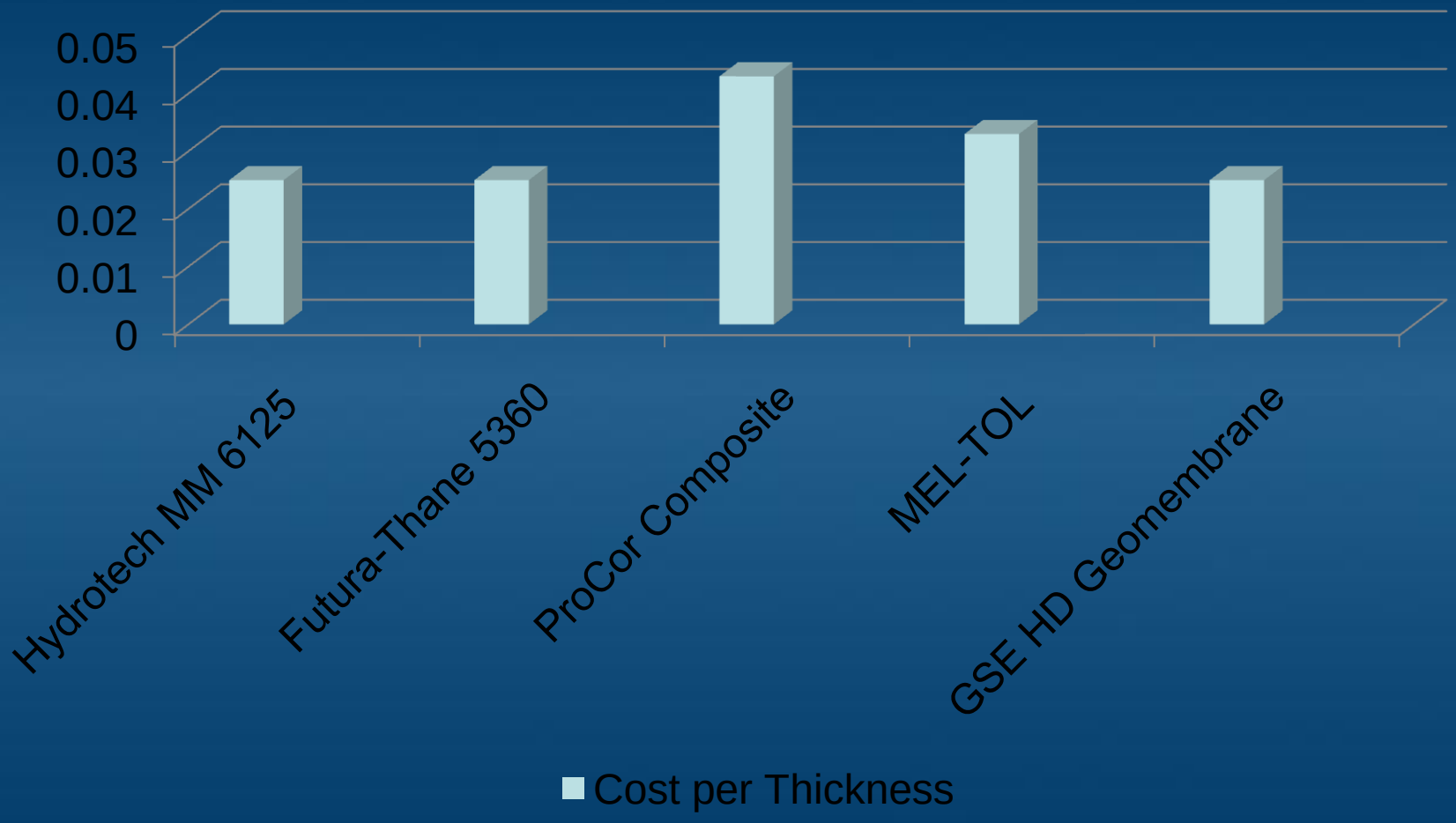
Material Cost Based on Thickness



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Conclusions

- Futura-Thane 5360 - Coating
  - New product in this field
  - Has not been used on a buried reservoir application
  - Due to hard coating not as much flexibility as a membrane
  - Inexpensive but only buying a 40 mils product

- GSE HD Geomembrane – HDPE Liner
  - Flexible material
  - 5 year material warranty, pay extra for up to 20 years
  - Can be NSF certified
  - Inexpensive but only buying a 60 mils product

Conclusions

- MEL-TOL – Rolled, Self –adhering Membrane
  - Flexible material
  - Only 5 year material warranty
  - Product used in the field for 20 plus years
  - More expensive based on product thickness of 60 mils

- ProCor Composite – Spray Membrane & Sheet
  - Multiple step process for installation to form the hard rubber
  - 5 year material warranty, pay extra for up to 15 years
  - NSF certified
  - More expensive based on product thickness of 140 mils

Conclusions

- Hydrotech MM 6125 – Rubberized Asphalt Membrane
  - Ease to install
  - Flexible membrane does not get hard
  - 50 years in the field
  - 20 year warranty for material and labor
  - Not NSF certified
  - 215 mils thickness
  - Cost is comparable if you take thickness into count

Questions