



Safety & Health Investment Projects [SHIP] Vault Platform Safety Design Project 2016 – 2017

Project Statement

Design and development of a working prototype of a Vault Safety platform to ensure safe ingress and egress to/from deep hazardous underground utility vaults.

Older existing vaults as shown lack safe ingress and egress capability, and at best are hazardous for even the most agile of workers.

Project Statement – con't

Current scenarios significantly impact the aging workforce as well as seasoned veterans having minor (non recordable) injuries such as mild sprains or strains.

A need exists to develop a device enabling injured, healthy, aging or physically challenged workers safe ingress and egress to large rectilinear utility vaults.

Participants in the SHIP grant

- City of Marysville
- City of Edmonds
- City of Puyallup
- City of Seattle
- Extreme Ergonomics – Design & Development

Device Parameters

- Safety
- Biomechanical ability (injured, aging, minor aches & pains)
- Ease of use
- Portability
- Maintainability
- Applicability to different vault types sizes and configurations
- Modification / adaptive capability



Typical State-of-the Art Vault





Typical State-of-the Art
with perilous ingress and
egress





**Oklahoma's Own**

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Tulsa Firefighters Rescue Man From Underground Utility Vault

Posted: Mar 03, 2015 8:19 AM PST Updated: Mar 03, 2015 10:23 AM PST

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WEB EXTRA Video From Tulsa Firefighters Rescued Man From Underground Utility Vault



TULSA, Oklahoma - Tulsa firefighters rescued a man who had fallen from a ladder into an underground utility vault Tuesday morning.

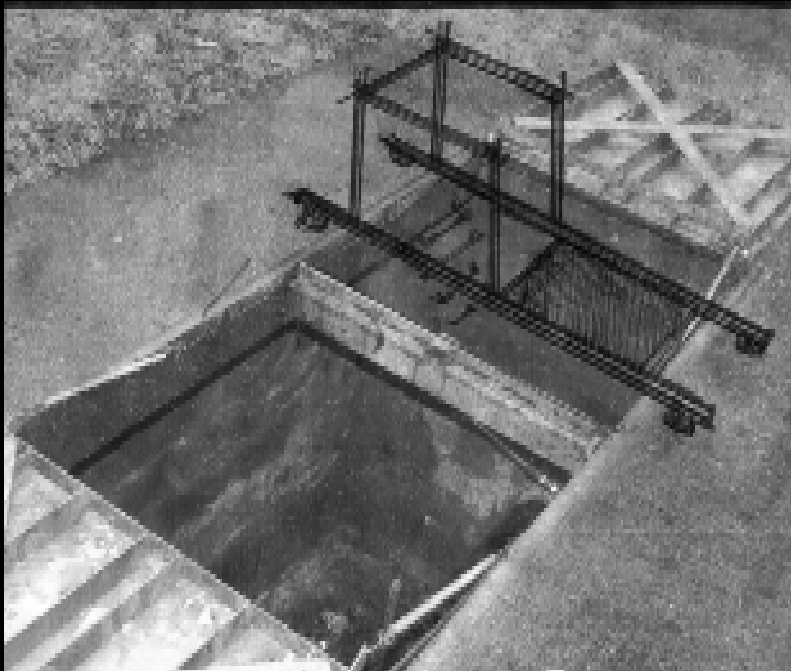
Rescue responded to the Public Service Company of Oklahoma Carson substation at 1122 South Cheyenne Avenue near downtown before 10 a.m.

Vault Platform Safety Design

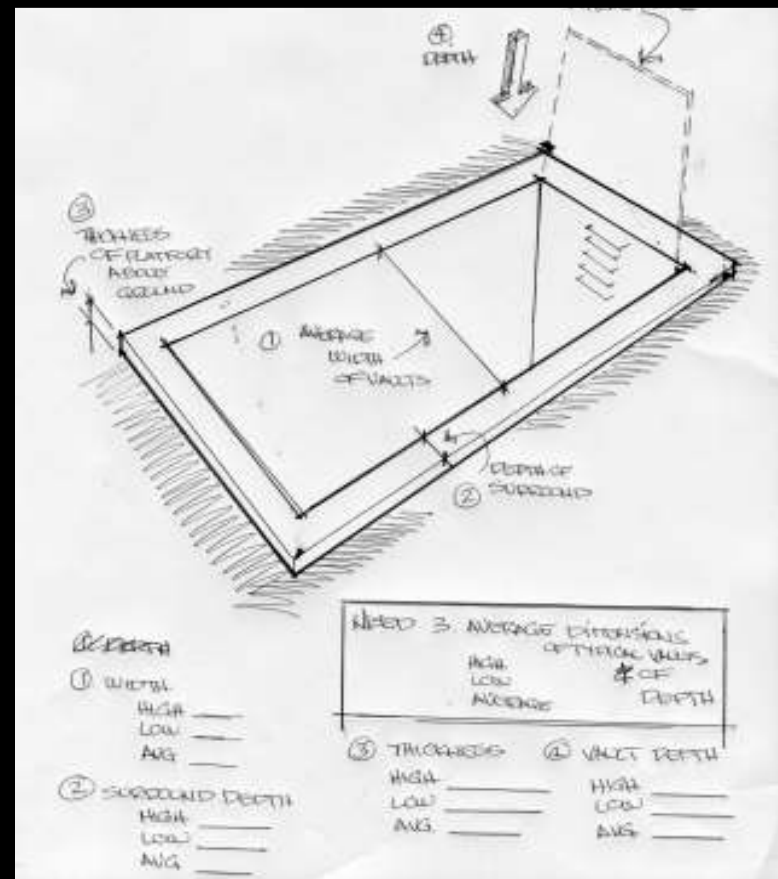
SHIP Project Final Benefits

- Improve Initial Access to Vaults
- Improve Confidence for Vault Work
- Improve Safety and Productivity
- Minimize Fall / Injury Risk
- Allows Work Task Flexibility

Prototype Development



Input from Utility Workers &
Resultant Conceptuals



Prototype Development



Base frame designed for hold
400# capacity with folding
capability



Prototype Development



Drop in grate platform added
to base

Quick release railing
added – meets ANSI
criteria



Prototype Development



Quick release pull pin mechanism allows portability, storage, ease of assembly and secure attachment of rail to base – designed to meet ANSI specification of 250# lateral force

In-Field Prototype Development



SHIP
Grant Program

Safety and Health
Investment Projects
SafetyGrants.Lni.wa.gov

Funding and support provided by the Department of Labor & Industries

In-Field Prototype Development





In-Field Prototype Development

Equipment handling tripod attachment explored - concept in abeyance due to potential misuse as a man-lift for rescue

In-Field Prototype Development



In-Field Prototype Development



Objectives Met

- Safety criteria met of establishing an effective means for safer and effective means for vault ingress and egress improving safety and productivity
- Provide a device which is collapsible, with capability to be stored in a pickup truck bed
- Ease of set-up by one or two workers
- Minimal time for set up
- Flexibility of device to be adapted or modified for worker needs – such as functionality as a work platform
- Ease of maintenance

Future Action

- Evaluation by municipal utility / ergonomic teams
- Document pros & cons
- Understanding the prototype is NOT an everyday use device and is SOLELY a prototype
- Determine any features or modifications required
- Document features
- Design & document new features
- Explore potential to have final full use device produced for next stage / permanent usage