



How Calleguas Municipal Water District used Value Engineering to Mitigate Risk

Project No. 603: Crew Building Expansion and Networking Relocation

Friday, May 9, 2025



Acknowledgements



Fernando Baez
Manager of Engineering



Tim Powers
Project Manager



Agenda



**Project
Background**



**How did we get
here?**



Risk Management



**Value Engineering
Applications**

PROJECT NEED: CREW BUILDING EXPANSION



1984 Original Construction

- 2,700 sq ft
- 14 employees housed
- 2 offices
- Restrooms & locker rooms
- Meeting area/kitchen

2005 Past Expansion

- 3,200 sq ft
- 17 employees housed
- 1 additional office
- Distribution tech office space
- Meeting area/kitchen

2024 Needed Expansion

- 14,200 sq ft
- 40+ employees housed
- 8 additional offices
- Replacement Emergency Ops Center
- Replacement workshop and parts storage for Instrumentation and Control Division
- Accommodates potential additional future expansion

EXISTING CONDITIONS



- Crew Building over-capacity
- Inadequate Staff Parking
- Inadequate Storage at Administration Building (not shown)
- Several Roofs in need of repair/replacement
- Scheduled Conejo Pump Station Rehabilitation (not shown) cannot begin until current Networking Center, Staff Offices, and Emergency Operations Center are relocated
- Emergency Operations Center and Networking Center are in the Conejo Pump Station, which could be inundated in the event of a Dike 5 breach

CREW BUILDING EXPANSION

CURRENT OVERCROWDING

- Sized for 17 employees, now houses 26
- Purchased trailer to accommodate additional space for staff and storage

CPS REHABILITATION AND SPACE REALLOCATION

- Instrumentation and Controls Staff will be displaced by CPS Rehabilitation

POTENTIAL HAZARDS

- EOC located in the CPS building and in the flood path of a potential failure of Dike 5

ADMINISTRATION BUILDING CONSTRAINTS

- There isn't space for additional staff in the Administration Building

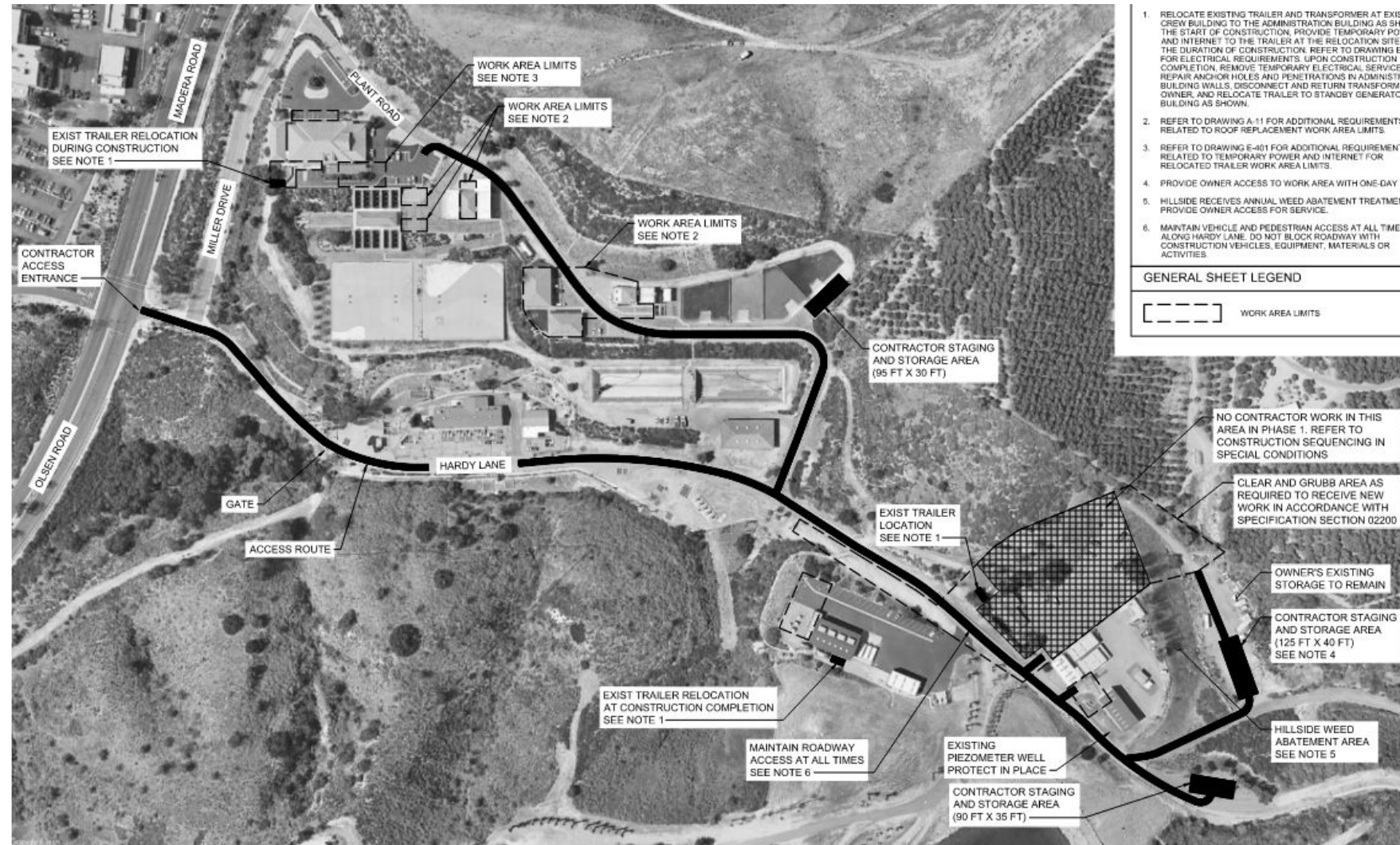
OPERATIONAL COLLABORATION

- Consolidating O&M staff (excluding Operations) in one facility enhances collaboration



PROJECT COMPONENTS

- Crew Building Expansion
- Rehabilitation of Existing Crew Building
- Networking Center Relocation
- Expansion of Control Building Laboratory
- Storage Space at Admin Building
- Roof Replacements
- Additional Staff Parking
- EV Charging Equipment
- Replacement of Hydropneumatic Pump Station



PROJECT CONSTRAINTS

- 17 facility shutdowns/completion milestones in Special Conditions
 - Liquidated damages included for each
 - Allowable shutdown windows from November 1 to January 31
 - Winter no-shutdown period each year establishes one 8-week period between January 1 and April 30 during which shutdowns are not allowed and all LBWFP facilities must be fully operational utilizing utility power
- 3 construction phases in Special Conditions to allow maintenance of facility operations and staff occupancy
 - Phase 1: New parking impacted in subsequent phases
 - Phase 2: Crew Building Expansion, Networking Center relocation, electrical improvements, and hydropneumatic system replacement
 - Phase 3: Existing Crew Building improvements
- 23 fiber optic termination, splicing, and outage steps in Special Conditions
- Seismic retrofitting needed to bring existing Crew Building up to current standards
- Completion of all work within 900 calendar days after NTP

PROJECT CONSTRAINTS

- 17 facility shutdowns
- 3 construction phases in special conditions (tie in/MOPO)
- Class B wasn't originally allowed but was for re-bid

Category	Bidder	Superintendent	Project Manager
(1) Installation pre-engineered metal building minimum of 10,000 square feet, including architectural finishes, building mechanical, HVAC, electrical, and plumbing.	2 projects	2 projects	1 project
(2) Construction of minimum 4160V, 3 phase electrical systems, including underground distribution and installation of 4160V power and electric switchgear, for municipal or industrial facilities. <i>Subcontractor may provide experience.</i>	2 projects	2 projects	1 project
(3) Communication system relocation including installation of new equipment and transfer of fiber optic and copper communication. <i>Subcontractor may provide experience.</i>	2 projects	2 projects	1 project

Category	Bidder	Superintendent	Project Manager
(1) Installation pre-engineered metal building minimum of 2,500 square feet, including architectural finishes, building mechanical, HVAC, electrical, and plumbing. <i>Subcontractor may provide experience.</i>	2 projects	2 projects	1 project
(2) Construction of minimum 4160V, 3 phase electrical systems, including underground distribution and installation of 4160V power and electric switchgear, for municipal or industrial facilities. <i>Subcontractor may provide experience.</i>	2 projects	2 projects	1 project
(3) Communication system relocation including installation of new equipment and transfer of fiber optic and copper communication. <i>Subcontractor may provide experience.</i>	2 projects	2 projects	1 project
(4) Construction of Mechanically Stabilized Earth (MSE) retaining wall a minimum of 10 feet in height. <i>Subcontractor may provide experience.</i>	1 project	1 project	1 project

BIDS

- 1 bidder = \$24.7M
- OPCC = \$15.3M
- Next step: Relax bidder qualification requirements
- 1 bidder = \$24.3M (same bidder, \$0.4M less)
- OPCC = \$ 15.3M
- Next step: Value engineering

HOW DID CMWD ARRIVE AT VE?

- Out to bid twice, both times lowest and only bid (same contractor) was ~60% higher than Engineer's OPCC (\$24.5 million vs. \$15.3 million)
 - Second time out to bid CMWD worked internally to reduce experience requirements/class of contractor (opened up to Class B bidders)
- CMWD Project Manager reached out asking for review of Design Drawings, Specifications, and supporting preliminary design documents to contemplate value engineering modifications to the design that might help reduce the project's cost

CMWD's Desired Outcome: justification and decision support and confidence to go back to their board that the correct price of the project given bidding environment; due diligence through third party, and seek opportunities to economize

URGENCY AND QUESTIONS

- **Time constraint: 90 days to accept or reject current bid**
- What's driving only receiving one bid?
- How can we make this project more attractive to contractors?
- What risks are being realized in this project delivery process?
- How can VE be useful at this stage of project development?
 - Implementable opportunities to improve bidding conditions and facilitate competitive bidding

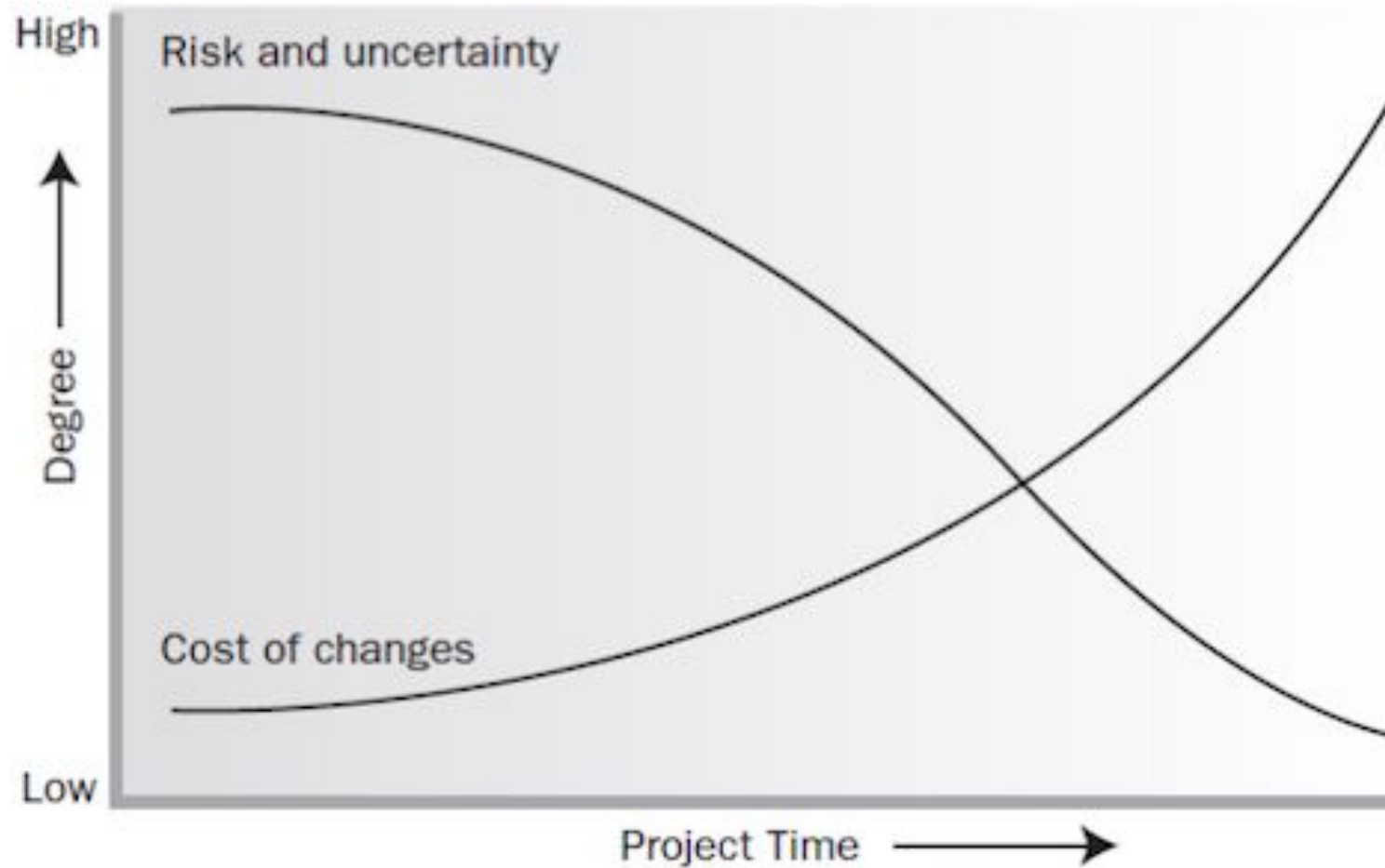
Contractors don't take risks, they price them! _____



Source: <http://mcgladrey.com/eClubNews/Change-orders-outsize-construction-contracts>

RISK ANALYSIS AND VALUE ENGINEERING

When to start?





Value Methodology

- **Systematic** process used by a **multidisciplinary** team led by a **qualified** VM Facilitator, to *improve the value* of a project, product, process, service, or organization through the **analysis of functions**
- Solutions must not sacrifice reliability, quality, or safety

$$\text{Value} = \frac{\text{Performance}}{\text{Resources}}$$




VE TEAM

- Fernando Baez, CMWD Manager of Engineering
- Tim Powers, CMWD Project Manager
- Alyssa Bailey, HDR Water EIT and Value Methodology Associate
- Rachel Bernhard, HDR Certified Value Specialist
- Pete Bredehoeft, HDR Cost Estimator
- Eugene Chen, HDR Architecture
- John Coffman, HDR Civil Site/Construction
- Dan Ellison, HDR Structural
- Andrew Tee, HDR Electrical



VALUE METHODOLOGY JOB PLAN

Provides the structure for
before, during, and after
the Value Workshop

1. Preparation

Pre-Workshop

2. Information

3. Function Analysis

4. Creativity

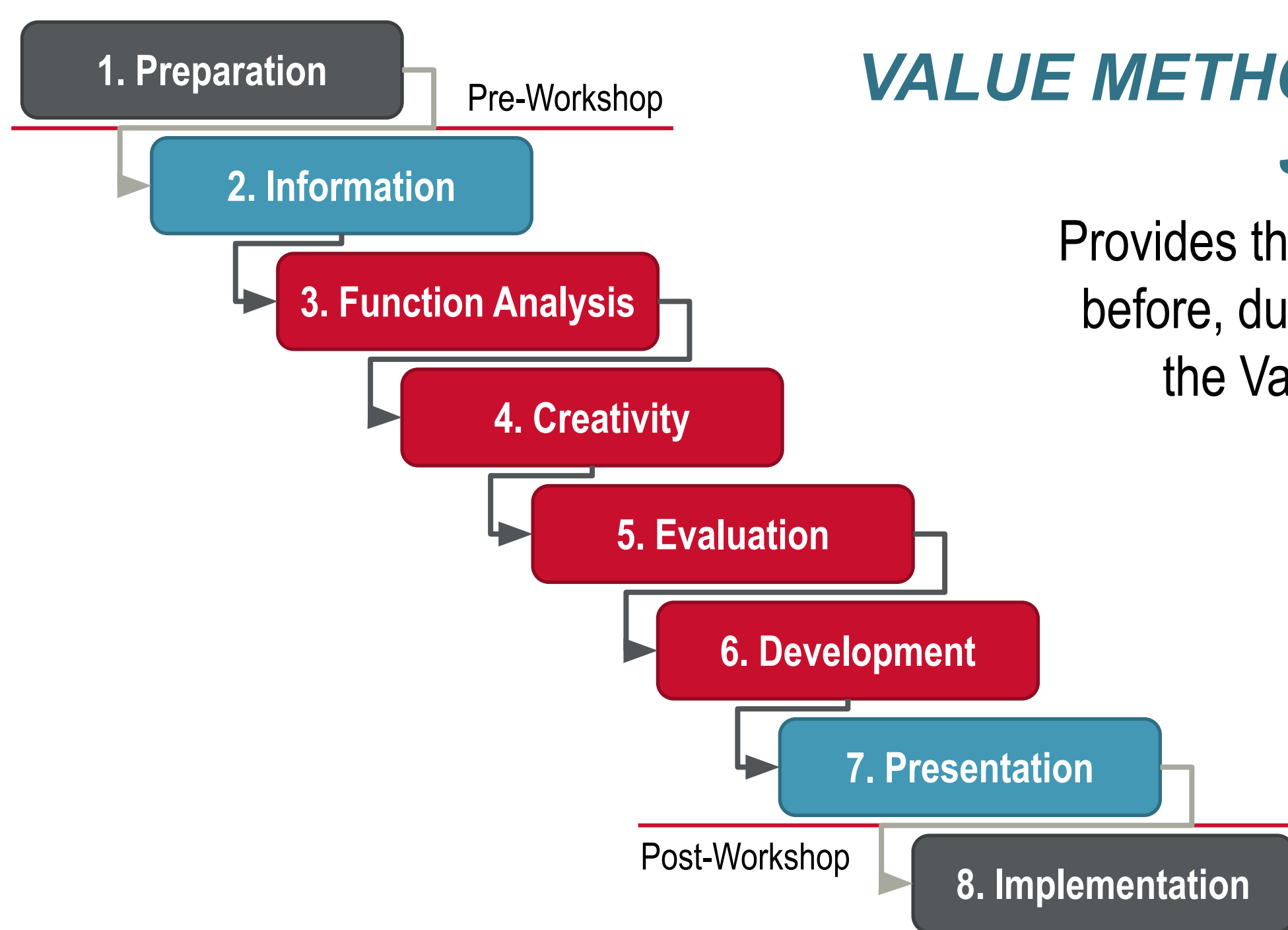
5. Evaluation

6. Development

7. Presentation

Post-Workshop

8. Implementation



INITIAL CREATIVITY AND RISK MITIGATION

- Break things up differently (unrelated scope)
 - Separate roof contract
 - Repackage while mitigating the risk of contractor conflicts
- Conduct additional/enhanced contractor outreach
- 13 phases for LDs over the span of 900 days
- Contractor is pricing risk (bidding requirements) – schedule imposed on contractor and interdependency of work
- Specific timelines under one contract
 - Enhance flexibility with timeline, or
 - Break up into several independent contracts to reduce contractor's risk

EVALUATION PROCESS

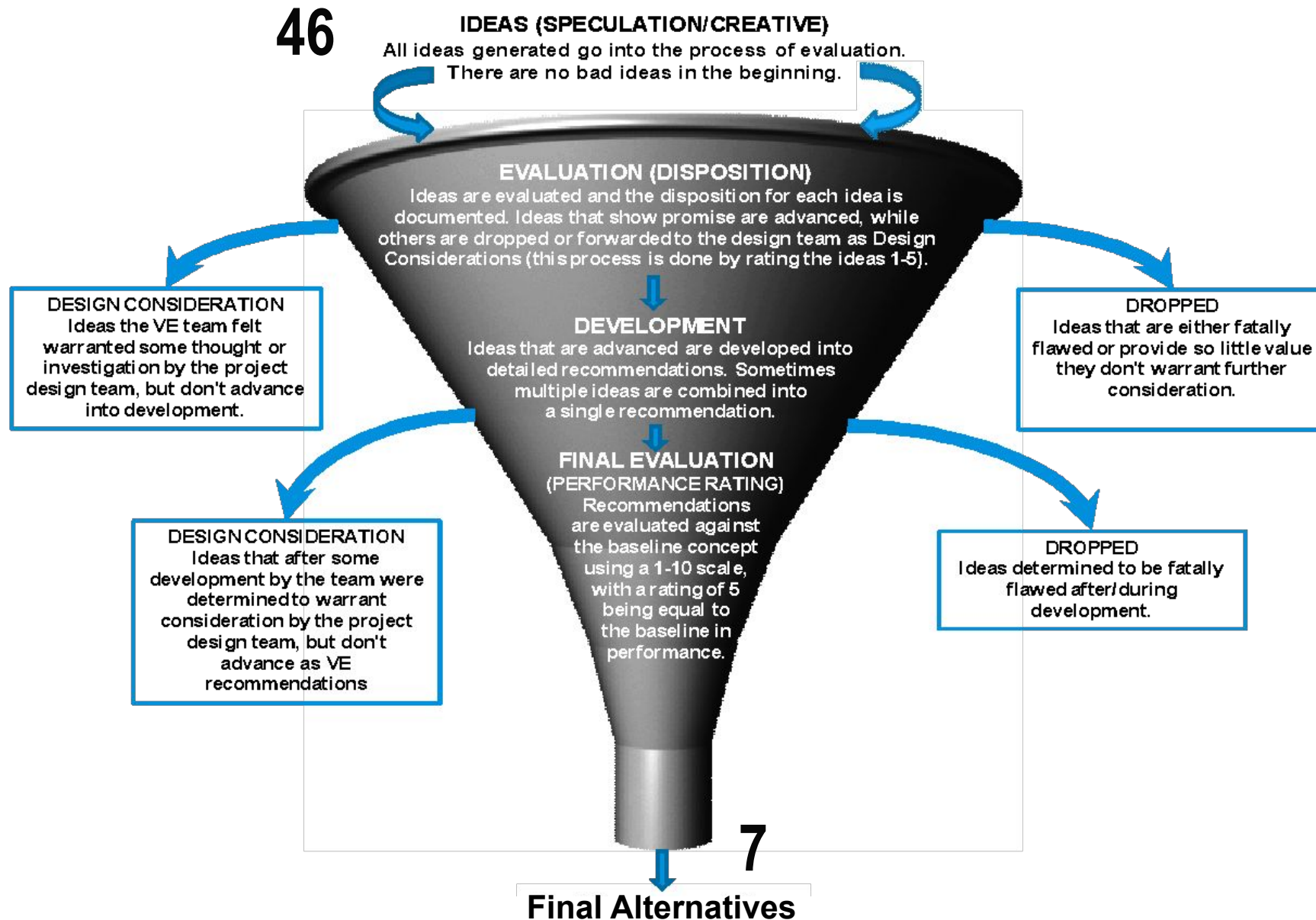
Idea No.	Description		
1	Separate roofing replacement work		
	Advantages		Disadvantages
	<ul style="list-style-type: none"> • Simplifies project blueprint • May improve bidding climate • Simplifies scope • May reduce roofing contractor cost escalation by requiring roofing work into shorter schedule 		<ul style="list-style-type: none"> • Minor additional coordination/potential site conflicts
	Rating:	Justification/Comments/Disposition:	
	3	Brought forward as Alternative No. 1	

0-Unacceptable Impact / Fatal Flaw 2-Good idea for design team to pursue

1-Poor Opportunity

3-Good Opportunity

EVALUATION PROCESS – TIERED APPROACH



7 Notable VE Alternatives

Alternative 1: Break Contract into Several Packages

1 Networking Center

- a) Fiber optic trenching
- b) Administration CMU storage facility

2 Civil/Site/Electrical

- a) Medium voltage electrical
 - a) Trenching and conduits
 - b) Install 5KV Sectionalizing Cabinet
 - c) Install Transformer No. 02
- b) Civil/Site
 - a) Hardy Lane Parking
 - b) Crew building, slope rough grading and retaining walls

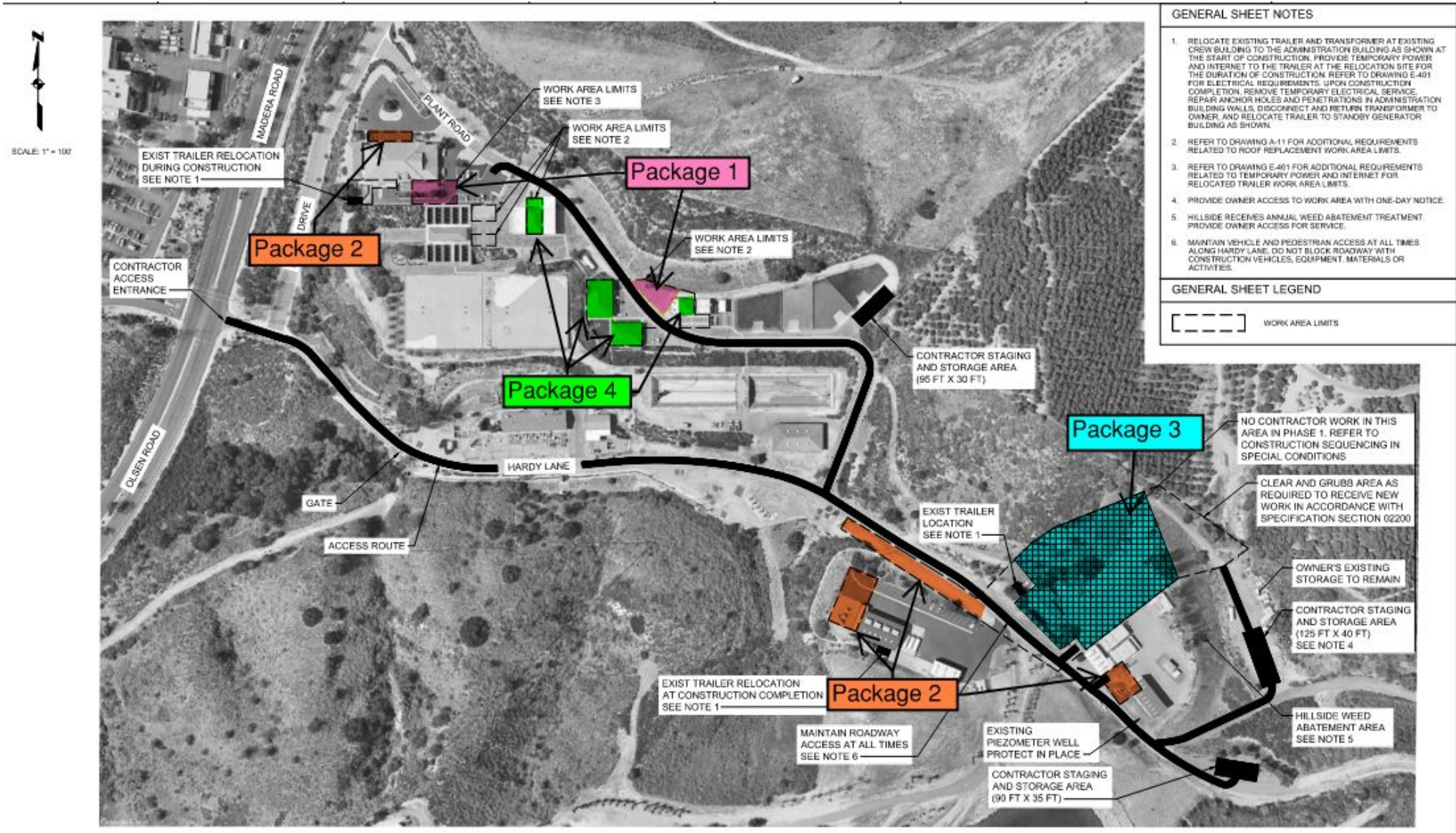
3 Building

- a) Wet utilities outside building to inside building footprint
- b) Crew building expansion
- c) Improvements to existing crew building
- d) Laboratory improvements
- e) Associated building parking

4 Roof Replacements

- a) Chemical
- b) Ozone Generator
- c) Preozone Contractors
- d) Control/Ozone

Alternative 1: Break Contract into Several Packages



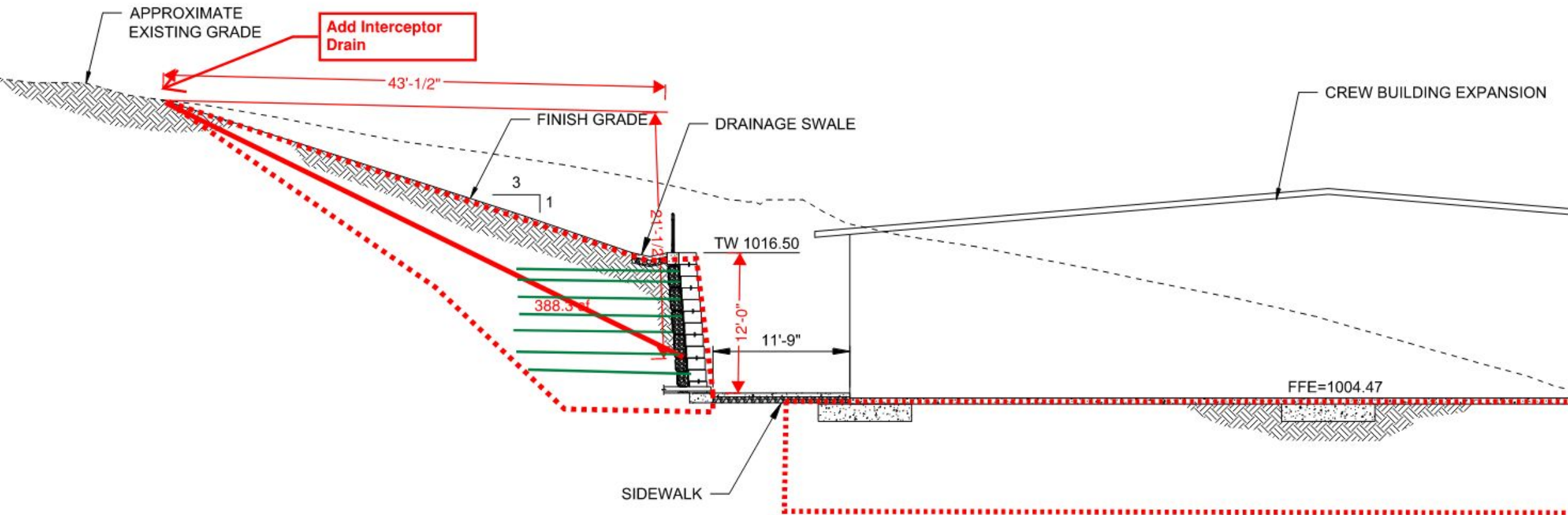
Alternative 2: Optimize Liquidated Damages

Liquidated Damages Table		
Work to be Completed	Calendar Days to Complete	Liquidated Damages
All contract work	900	\$2,000 per calendar day
Work necessitating plant shutdown	2.5 days	\$1,200 per hour
Work affecting use of Administration Building, Crew Building, and Control Building	2.5 days	\$2,000 per calendar day
Work inside of Control Building	150 days	\$2,000 per calendar day

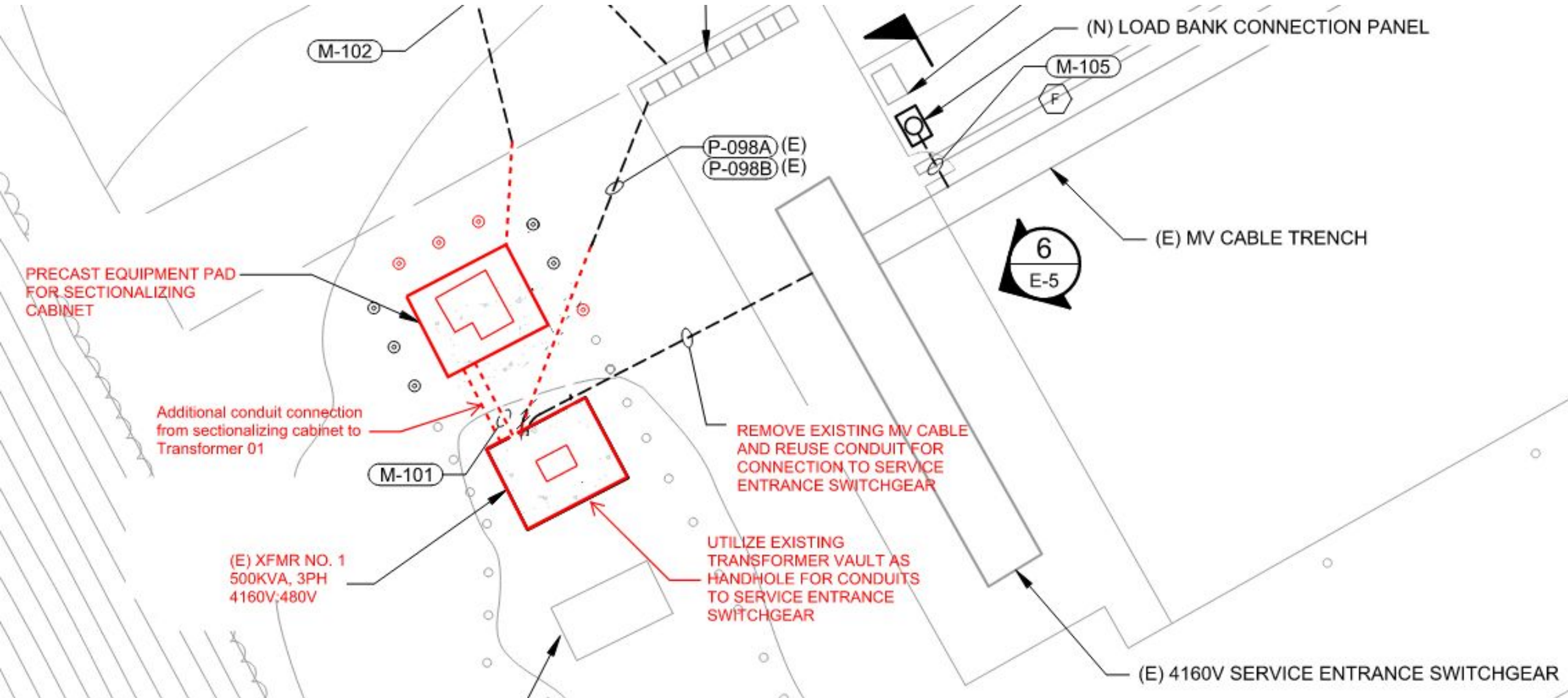
Alternative 2: Optimize Liquidated Damages

Anticipated Outages			
Work Activity	Facilities Affected	When Work May Occur	Other Requirements
Work involving interruption of power	All or some plant and building facilities	Weekends Nov. 1 thru Jan. 31	Submit written plan 8 weeks prior to outage
Work involving interruption of water or sewer service	Crew Building	Weekends	
Work inside Control Building	Control Building	7am to 7pm Aug. 1 thru Jan. 31	
Relocation of Trailer	Trailer	Weekends	
Adding Breaker for Trailer at Admin Bldg	Admin Building	Weekends	

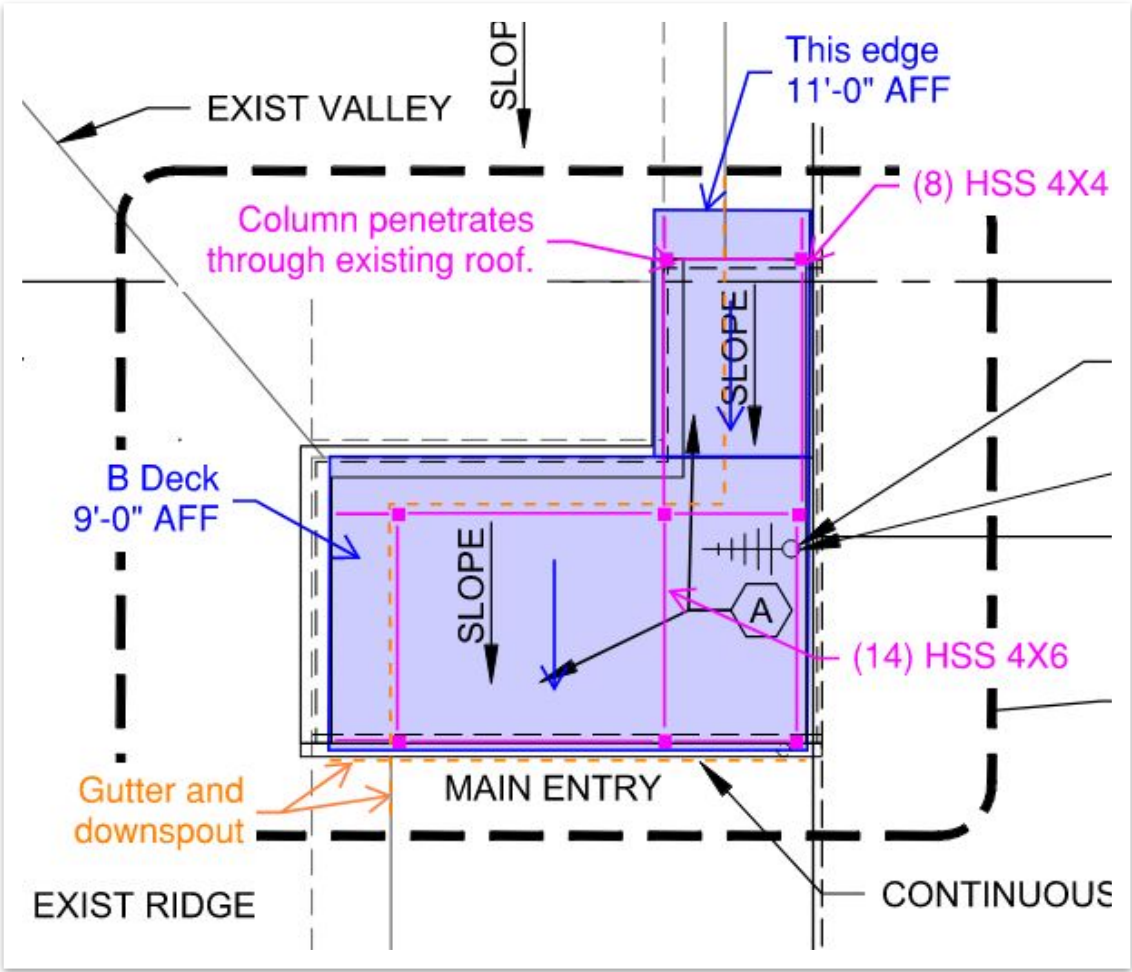
Alternative 3: Use 2:1 Slopes to Reduce Earthwork and MSE Wall



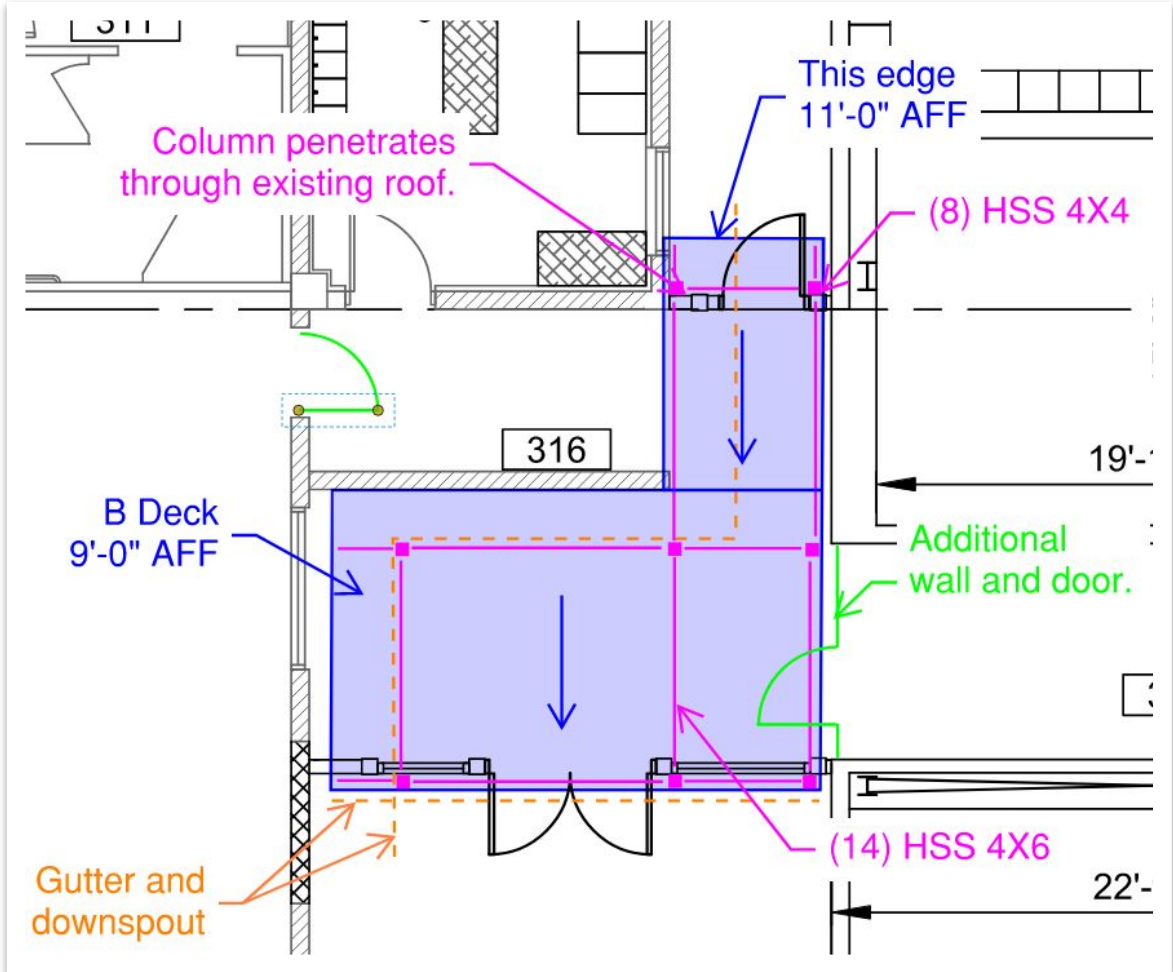
Alternative 4: Protect-in-Place Existing Transformer 01



Alternative 5: Replace Crew Building Vestibule with Covered Walkway



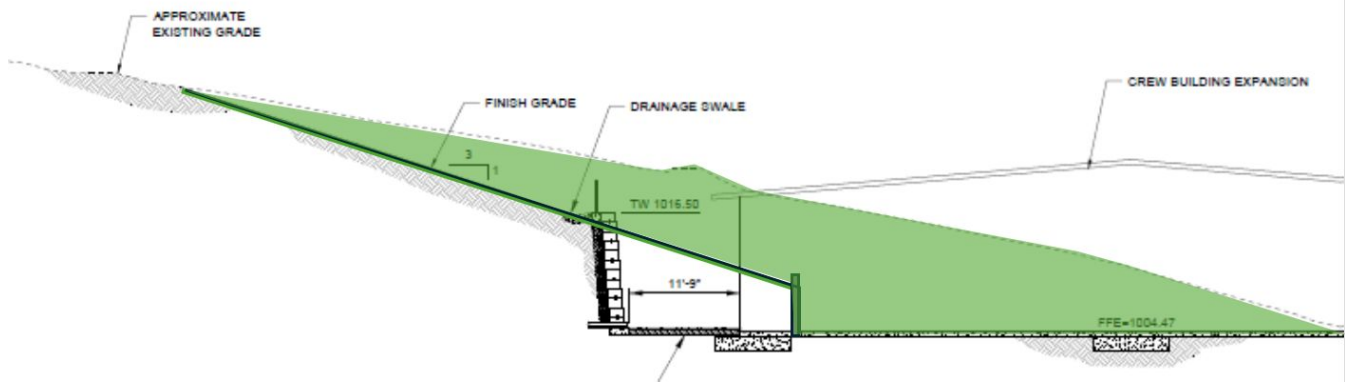
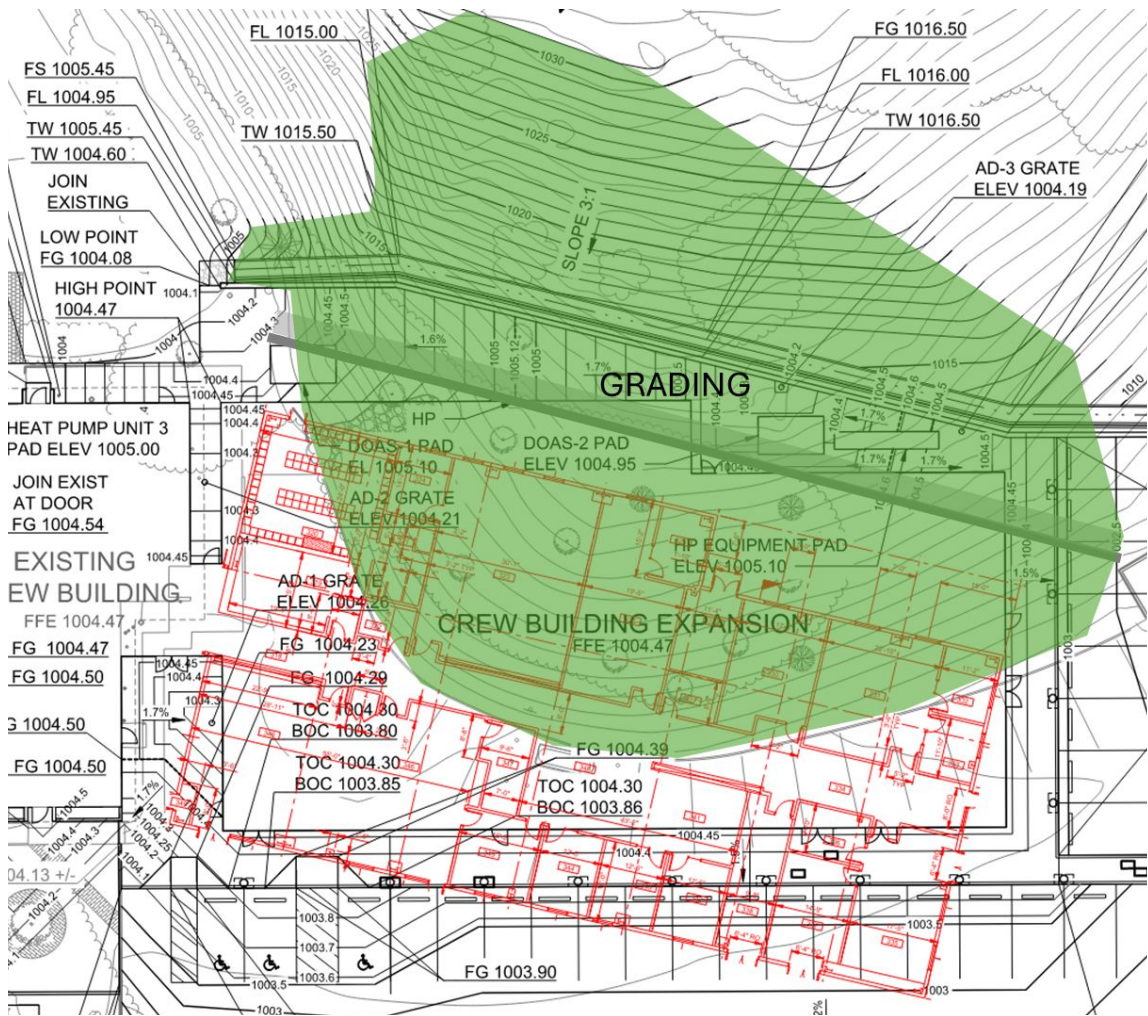
Roof Plan



Floor Plan

- = Dec ■
- = Stru ■ral Members ■ ■

Alternative 6: Rotate and Shift Crew Building Expansion



Alternative 7: Identify Areas to Store Excess Fill and Reduce Haul



Key Takeaways and VE Best Practices



**Incorporating
Risk into VE**



**Owner Support/
Participation**



**Strong Team of
Subject Matter
Experts**



**It's Never Too
Late to Improve
Value**

Thank you, CMWD!



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Tim Powers
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