

ROSETTA<sup>®</sup>  
**SUMMIT**  
2023

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# Engineering Wall Design



# Agenda

- Team Introduction
- Design Resources
- Engineering Wall Design FAQs
- Case Studies

TEAM INTRODUCTION

# Contractor/Project Support Team



Gerry Garcia



Larry Fallon

TEAM INTRODUCTION

# Civil Engineering Team



Laura Helbling, PE



Turner Gruenewald, EIT

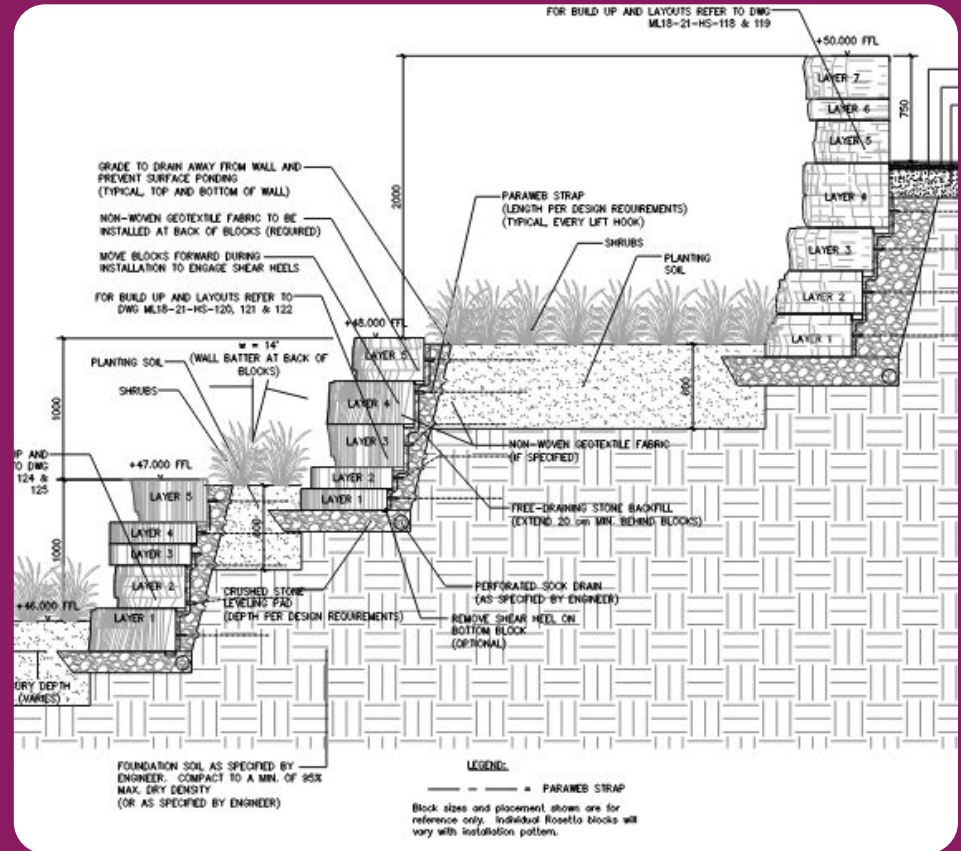


Daniel Cerminaro, PE

# Civil Engineering Team Introduction

- Design Resources
- Feasibility Assessments
- Engineering Training Sessions
- General Project Consulting

No, we don't draw the forms. That's our fantastic Mechanical Team!



# Design Resources

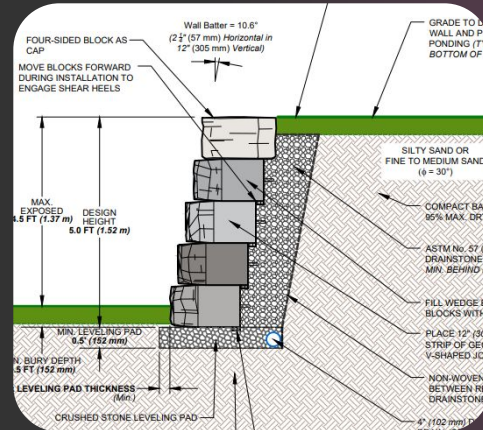
# Design Resources

- Preliminary Wall Sections
- Outcropping Layout App
- Construction Details
- Technical Guide
- Installation Manuals
- SketchUp Models
- Specifications
- Testing Reports

Grand Ledge Preliminary Wall Sections

Enter data specific to your site, then click "Search for Wall Sections" to gain insight into potential solutions for your wall scenario.

1. Select Unit of Measurement ?
2. Define Wall Height ?  
 Feet
3. Define Soil Type ?
4. Define Load Conditions ?





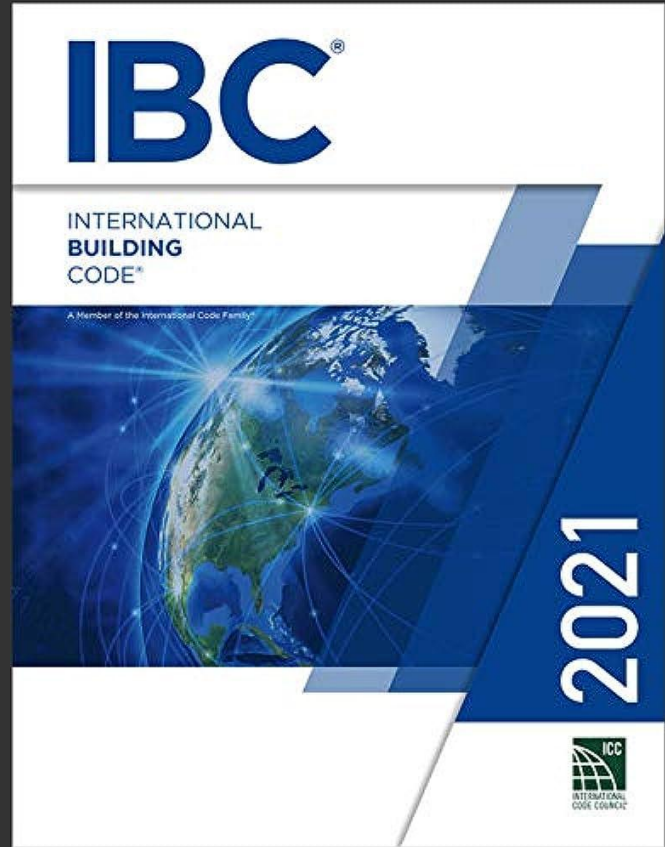
# Built Environment

- Rosetta - no longer just landscape walls
- Taller, more complex structures
- Require engineering



# International Building Code

- What height retaining wall requires engineering design?
  - 48 inches (4 feet) for walls retaining soil
  - 24 inches (2 feet) for walls retaining lateral loads in addition to soil
- Requirement for all retaining walls, not Rosetta specific



# Landscape vs. Retaining Walls

- Landscape walls
  - Short in height and not supporting structures
  - Failure occurs
    - Stack the blocks back up
- Retaining walls
  - Taller height and/or supporting structures
  - Failure occurs
    - Loss of life
    - Loss of property
    - Lawsuits
- Rosetta Outcropping and Grand Ledge
  - Large blocks are very different than small, hand placed blocks
  - Cause more damage



# Engineering Wall Design FAQs

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# What information is needed for a retaining wall design?

- Site specific soil information
  - Internal angle of friction, unit weight, cohesion
  - Geotechnical report
  - Local knowledge
- Special site conditions
  - Water or seismic loads, bedrock, property limits
- Grading plan
  - Wall height, slope information, embedment requirements

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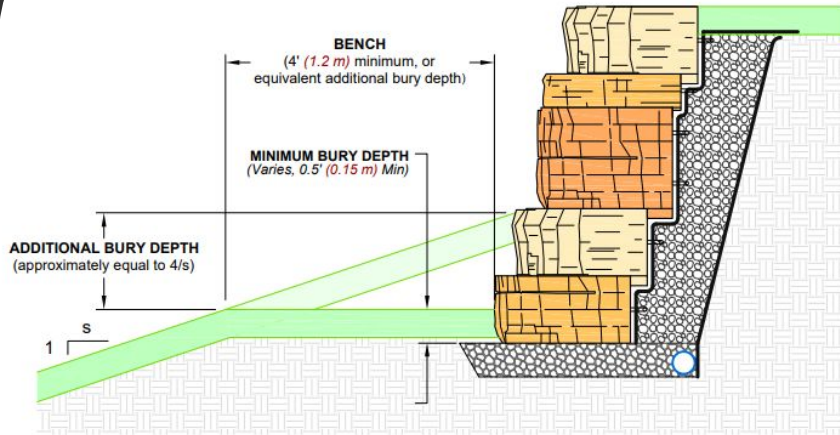
What information  
is needed for a  
retaining wall  
design?

- Layout and utility plan
  - External loading and utility crossings
- Top of wall finish options
  - Coping or freestanding, handrail attachments

- Accurate soil assumptions
- Accurate heights, lengths, and radii
  - Scalable drawings
- Appropriate embedment/bury depth
  - 6 inches minimum
  - Level toe -  $H/20$
  - 3H:1V toe slope -  $H/10$
  - 2H:1V toe slope -  $H/7$

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What to include in a preliminary takeoff to match final designs?



MINIMUM ADDITIONAL BURY DEPTH

RUN OF SLOPE, s (ft)	ADDITIONAL BURY DEPTH (ft)	ADDITIONAL BURY DEPTH (mm)
10	0'-5"	120
8	0'-6"	150
6	0'-8"	200
4	1'-0"	300
3	1'-4"	400
2.5	1'-7"	500
2	2'-0"	600

What to include in a preliminary takeoff to match final designs?



- Apply this information to Preliminary Height Guides
- If the scenarios don't match, what to do?
  - Reach out to Rosetta Engineering Team
  - Engage Wall Design Engineer

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What to include in a preliminary takeoff to match final designs?

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# Why do you need a local engineer to rely on for retaining wall design?

## Local knowledge

- Soils, wind, seismic, other specialized design requirements

## Relationships

- Knowing local jurisdictions to simplify permitting process

## Consistency

- Understanding product offerings and company specifics creates efficiency

- Make introduction with Rosetta products (if they're unfamiliar)
- Request preliminary wall design for specific project for pricing
  - Include as much pertinent information as possible
- Once sale is complete, request final design

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What is the process of engaging a wall design engineer on a project?

- Liaise between retaining wall team throughout project life
  - Wall design engineer, site and geotechnical engineers, contractors, and project owner
  - More time involved, but end with a better overall experience

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What is the process of engaging a wall design engineer on a project?

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# When to engage a wall design engineer?

- Depends on complexity of the project
  - Simple project that matches preliminary height guide - final design
  - Complex project - preliminary design

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# How do you contract with a wall design engineer?

## Engineer and Manufacturer

- Ensure Rosetta product is designed and constructed
- Standard practice to include design fee markup

## Engineer and Contractor

- Limited time and involvement by manufacturer

## Engineer and Owner

- Some involvement, but less control by manufacturer

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# How much does a wall design cost?

- It depends
  - Size, type, and complexity of wall
- Simple retaining walls
  - \$1 per square foot
- Complex retaining walls
  - \$3 - \$4 per square foot (or more)

- Engineers that are already understand retaining wall design
- Education on products
  - Lunch and Learn presentations
- Example wall designs and construction plan sets
- Pictures

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How to get engineers comfortable with designing Rosetta walls?

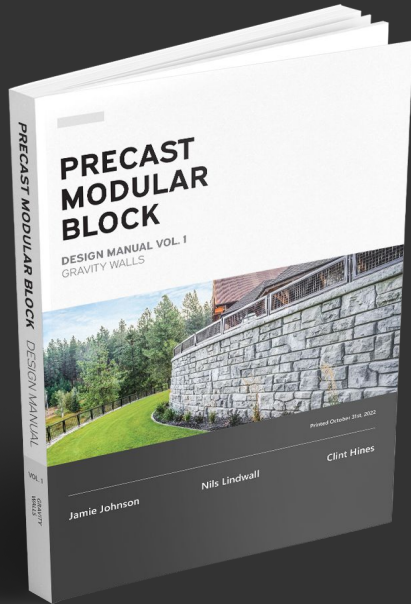


- Design resources Rosetta offers
  - Sample calculations
  - Testing reports
  - SketchUp models
- Civil engineering team consulting
  - Project specific support
  - Training sessions

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How to get engineers comfortable with designing Rosetta walls?

# Precast Modular Block Design Manual: Vol. 1 - Gravity Walls



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How to get engineers comfortable with designing Rosetta walls?

<https://www.asterbrands.com/pmb-design-manual-download>

# Rosetta Civil Engineering Team

- Services offered
  - Design Resources
  - Feasibility Assessments/Project Consulting
  - Training Sessions
- Services not offered
  - Site specific retaining wall design (plans and calculations)
  - Not licensed or structured to do this level of design work
  - We will be a bottleneck for project timing and could lose projects
- Operate best when collaborating with wall design engineers



# Case Studies

ROSETTA<sup>®</sup>

Rosetta

Walls

An engineered solution

# Storm Water Management Solutions

# Boomer Creek at Oklahoma State University Campus

## The Challenge:

- Constant flooding during heavy rain
- Old drainage plan not suitable for modern day
- Overcharged drainage



# Boomer Creek at Oklahoma State University Campus

## Scope of Work:

- Expand width of creek
- Erosion control
- Expand capacity
- Existing trees
- Pedestrian bridge









# Boomer Creek at Oklahoma State University Campus

## Solutions and Results:

- All three wall designs used
- CIP
- Wall layout success
- Highlighted in SWS (Stormwater Solutions) Magazine



# Gaining Usable Space

# Private Residence Lenoir City, TN

## The Challenge:

- Severe slope in backyard
- Expand outdoor experience
- 12.0' maximum height



# Private Residence Lenoir City, TN

## Scope of Work:

- Build Wall to Level Site
- Engineered Design
  - MSE Design
  - Local Engineer Training









# Questions?

Reach out to Civil Engineering Team after this presentation!

# Thank You Sponsors!

