



CLEANING BY GREENING

ADAPTIVE REUSE OF AMERICA'S OPEN-PIT MINES

PROJECT DESCRIPTION

This thesis aims to answer one overarching question: "What can we do with abandoned open-pit mines?" Open-pit mines are those that are on the surface of the earth - typically a stepped hole in the ground. Abandoned surface mines can be hazardous if they are allowed to erode, settle, or even collapse. The current practice to deal with abandoned open-pit mines is to add soil and grasses on top of the disturbed areas or let them fill with water. This thesis proposes a radically different approach - to create architecture within them.

The cities adjacent to these mines are typically on the decline - both in terms of economy and population. This thesis proposes a framework that can be applied to any open-pit mine and has been enacted in the Thunderbird Mine in Virginia, Minnesota. This framework guides the transformation of these barren holes in the ground into living, recreation, and attraction areas. This can be done by analyzing the mine using several different metrics, followed by creation of architecture, then injection of hundreds of people into new living accommodations within the mine. Creating attractions, such as a resort or educational visitor center (shown on boards below), will generate additional tourist traffic - thereby increasing the area's population, boosting the region's economy, and enhancing the barren environment.

This idea is not to create a separate city within the mine - rather, it is the following: inject more people into the area by promise of seclusion, nature, novelty, and beauty, to create a symbiotic relationship between the mine below and the cities above.

FRAMEWORK FOR MINE RECLAMATION

This framework is created so that it may be applied to any open-pit mine on earth. In our region, they are most prevalent near the Mesabi Iron Range in northern Minnesota. However, abandoned open-pit mines exist throughout the globe. This thesis enacts the framework in the Thunderbird Mine in Virginia, Minnesota.

1 - ANALYZE - WHAT IS THE AREA LIKE?

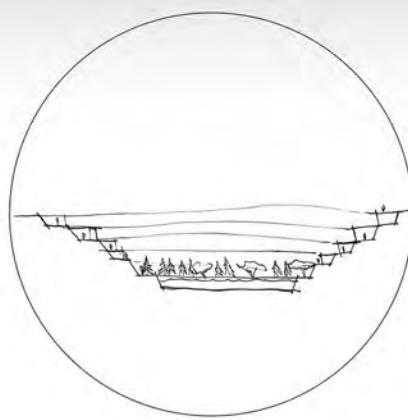
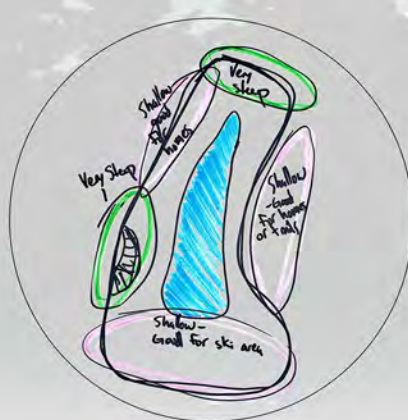
- Climate and economic trends?
- Population trends, current businesses and amenities?
- Mine size and slope?

2 - EVALUATE - WHAT DOES THE AREA NEED?

- Quantity of people?
- Which amenities?
- What greenery?

3 - IMPLEMENT - BUILD AND PLANT

- Remove or cover harmful material
- Implement all typologies needed. Ex: homes, attractions, museums, etc.
- Add greenery between each typology



MATERIALS & PLANTINGS



GABION CAGE WALLS
• ON-SITE ROCKS
• MINIMAL EMBEDDED ENERGY
• INDEPENDENT, DURABLE



WOOD CLADDING
• SOURCED FROM NEARBY SUSTAINABLE FORESTS
• MINIMAL EMBEDDED ENERGY
• WEATHERS NATURALLY

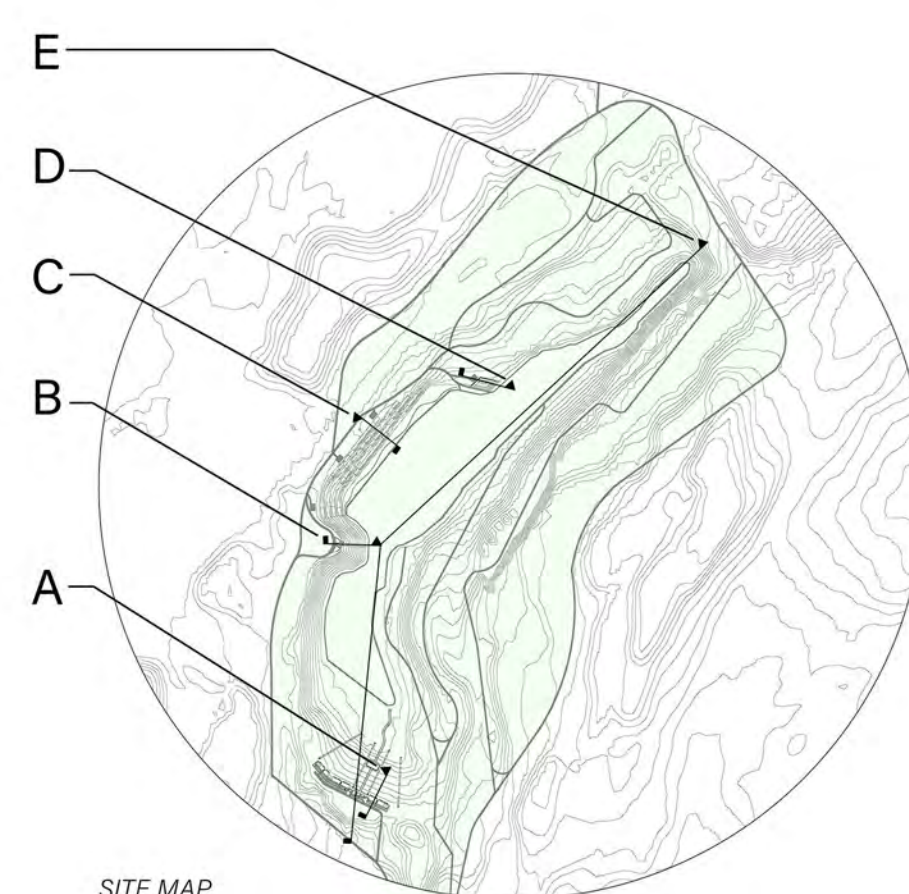


MIXED FOREST
• MIXED DECIDUOUS/CONIFEROUS FOREST TO BE PLANTED THROUGHOUT THE SITE
• THIS FOREST TYPE IS NATIVE TO THE REGION



OPEN PRAIRIE
• PRAIRIES IN BETWEEN POCKETS OF FOREST
• HABITAT FOR INSECTS, BIRDS, REPTILES, AND MAMMALS OF ALL SIZES

SITE INFORMATION



SITE - THUNDERBIRD MINE

- PROPOSED POPULATION: 500
- AREA: 1 mi²
- ELEVATION - BOTTOM: 120'
- ELEVATION - TOP: 370'

EVELETH

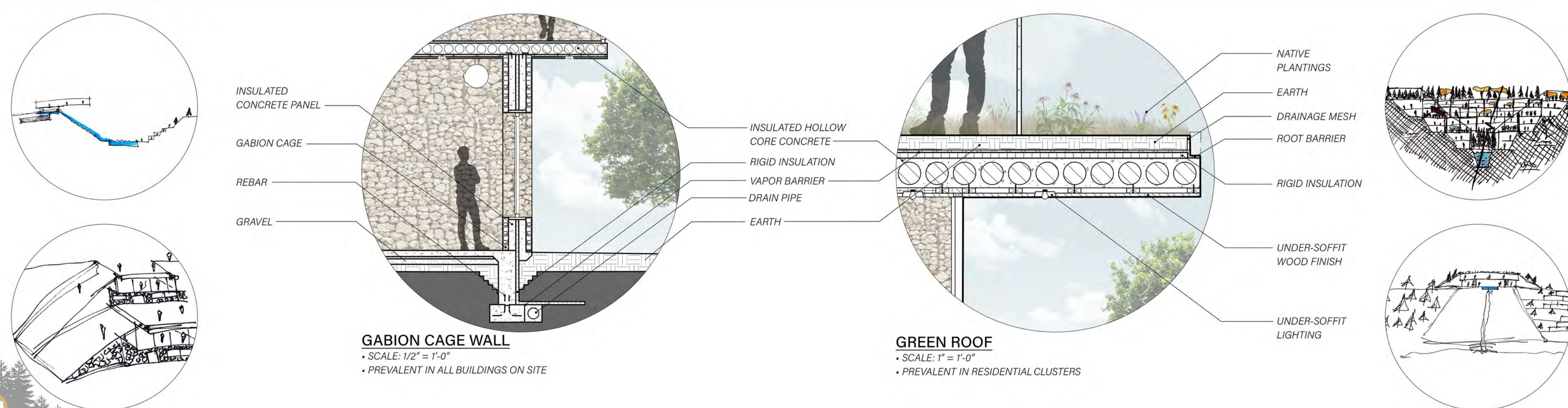
- POPULATION: 3,493
- AREA: 8.5 mi²
- ELEVATION: 128'
- MEDIAN INCOME: \$28,000

VIRGINIA

- POPULATION: 6,471
- AREA: 39 mi²
- ELEVATION: 1,440'
- MEDIAN INCOME: \$25,000

SITE - VIRGINIA, MINNESOTA

DETAILS & SKETCHES



ISOMETRICS, SECTIONS, & FLOOR PLANS

