

CIELO CENTRO

UNM | University of New Mexico

SSA | Sam Sterling Architecture

Pland Collaborative

5-14-24

CIELO CENTRO PUBLIC MEETING

Colin Nicholls

Science Dept. Chair, UNM-Taos



CIELO Centro – The Impetus

The donation by the family of Melinda King of Las Trampas of what would be the largest publicly accessible telescope in the Southwest



CIELO Centro – The Telescope



- Will be the largest publicly accessible telescope in NM
- 36" Diameter
- 144" Focal Length (F4)
- Advanced Sandwich-Mirror Design (stiff, light, fast cooling, low expansion)
- Currently re-engineering mechanics to ensure suitable for routine public use

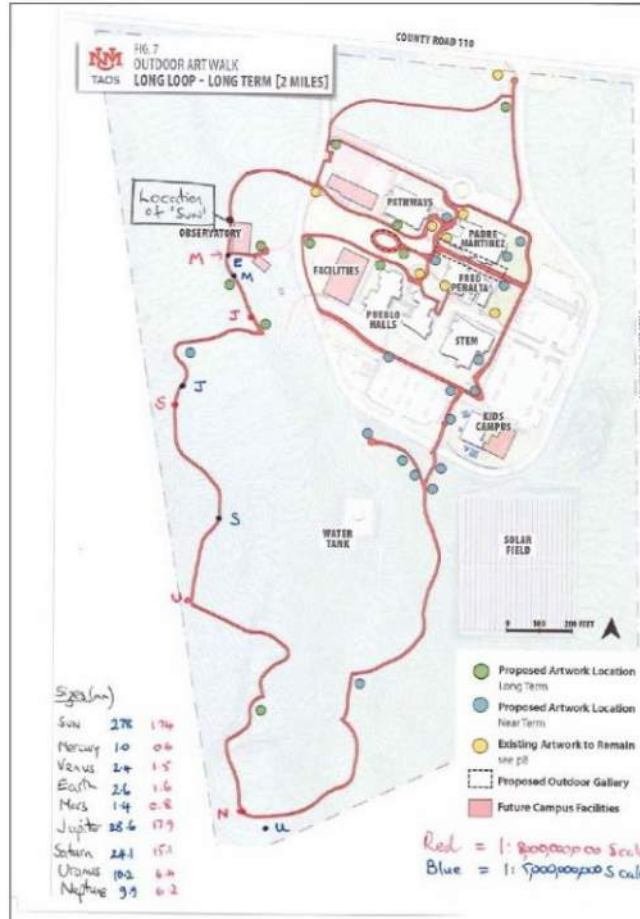
CIELO Centro - The Vision

“A Northern NM center to educate and inspire students, residents, and visitors”

- Observatory
 - View the sky through the largest publicly accessible ‘scope in the S/W
 - Visitors use the college’s ‘scopes or bring their own
- Education Center
 - Open for UNM-T students, K-12 outreach and visitor education
- Outdoor Amphitheater
 - Open air astronomy sky tours & other presentations
- Combined Nature/Solar System & Artwalk Trail



CIELO Centro – Approx. Facility Locations



Proposed Incorporation of Solar System Trail into UNM-T Artwalk Loop

It has long been intended to incorporate a solar system trail into the Space STEM Center. The discussion on 1/8/24 seemed to cast doubt on the feasibility of that. This proposal intends to show that the solar system can readily be incorporated into the Art walk trail.

Two options are shown here: Scale 1:8 Bn (red) and 1:5 Bn (Blue). The sizes of the Solar system objects in mm for each option are shown the table, bottom left. The approximate location of each planet is shown by its initial on the Trail map.

Positions are not shown for Mercury & Venus, since they are too close to the observatory wall to be seen on this diagram

CIELO Centro Observatory – Why No Dome ??



Ash Dome Observatories

- A Dome is great for Research
- (Protection from Cold, Wind)

• *BUT –*



Bruneau Dunes Observatory (ID)

- *Narrow FOV, claustrophobic, only one scope usable*

Not Good for Connecting People to the Sky!!



CIELO Centro Observatory – What do WE want??

ACCESS TO THE ENTIRE SKY



Alqueva Observatory in Cumeada, Portugal

MULTIPLE 'SCOPES & PROTECTION

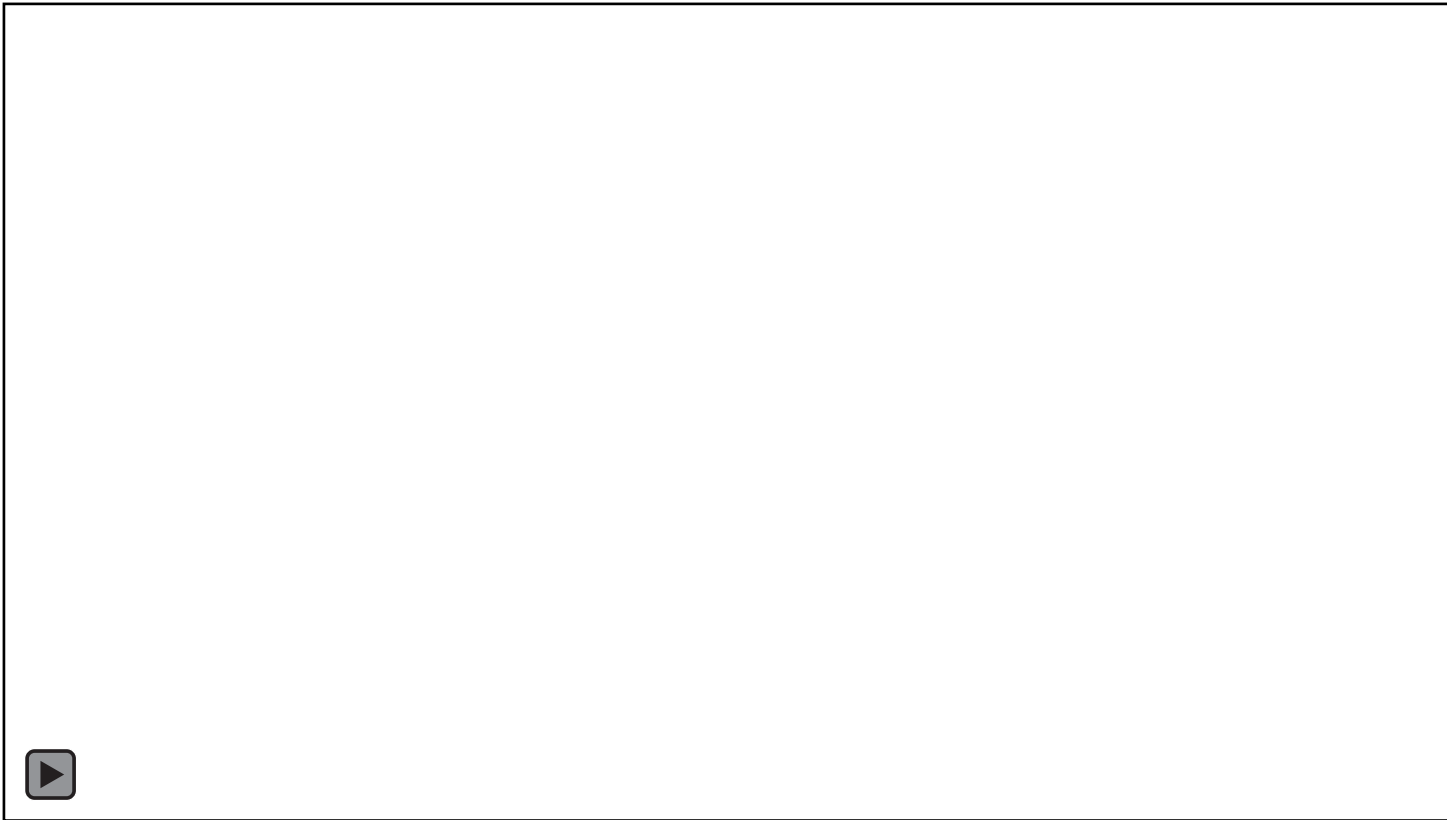


Rancho Mirage Observatory, CA



CIELO Centro Observatory

- A RORO!!! (**Roll Off Roof Observatory**)



U. Hawaii, Maui College



Public Outreach Observatory



Lowell Giovale Open Deck Observatory, Flagstaff , AZ

CIELO Centro Facilities – Amphitheater



Switch from Presentation in Amphitheater



To Pointing at Real Object in Sky

S-STEM Facilities – Solar System Trail



A Solar system trail marker in Essex County MA

- Solar System Trail
 - Demonstrate the scale of the Solar System, by placing markers/Models along a Trail
- Will be Integrated with Klauer Trail System
- EcoTrail
 - – Teaching Biology/ Ag. Science
 - - Apiary, Pollination, Plantings
- Exercise/Fitness Trail
 - - Teaching Anatomy/Physiology
 - - Activities & Exercise Apparatus
- Artwork Trail
 - - Current Artworks will be renovated and displayed

SSTEM Programmatic Changes (Workforce Dev't)

- Develop STEM Internship Track
 - Add Relevant Courses Linked to CIELO Centro facilities.
 - (Astronomy, Pre-Eng., Communications)
 - Fund Student Internships at STEM Employers.
 - Expose UNM-T Students to regional/national STEM Employment possibilities.
- Dark Sky Initiative
 - Educate and Empower Community Members to preserve Dark Skies.
 - Build advocacy for cultural, environmental and economic preservation.



CIELO Centro Observatory Partners

- TECHNICAL ADVISORY TEAM

- Dr. Charlie McMillan, Gary Zientara, Geoff Goins, Phil Poirier, Dr. Tony Hull

- EL VALLE ASTRONOMERS

- Managing & Storing Equipment Donations
 - Scope Set up
 - Technical Advice



EDUCATIONAL OUTREACH

STEM Education



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is
Inspiring



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Space Literacy



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is
A Critical Asset

Multidisciplinary Learning



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is
Authentic



Collaboration and Communication



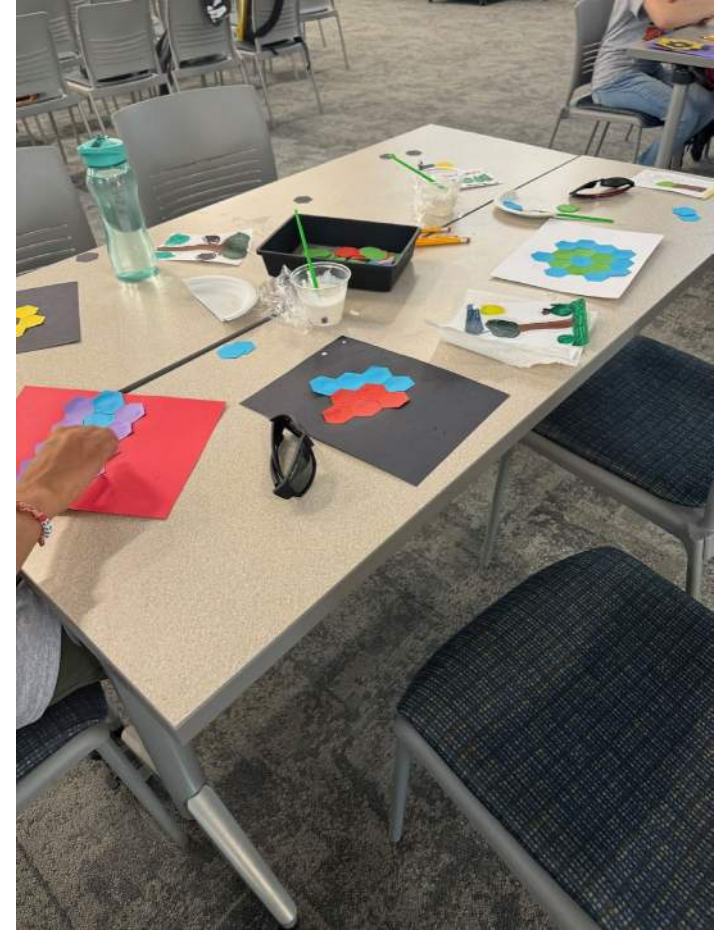
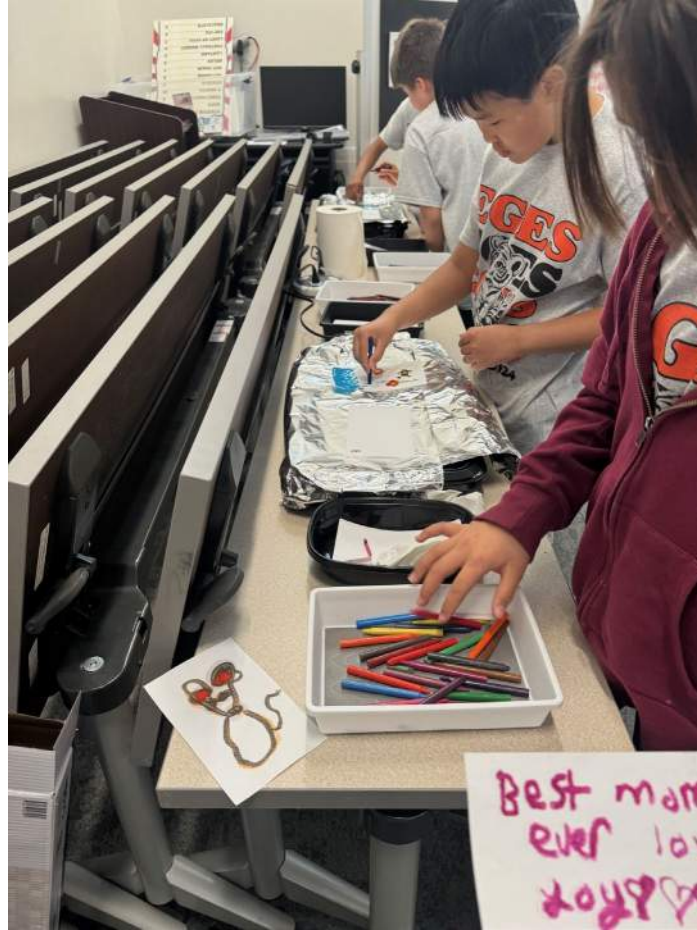
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is
A Nexus



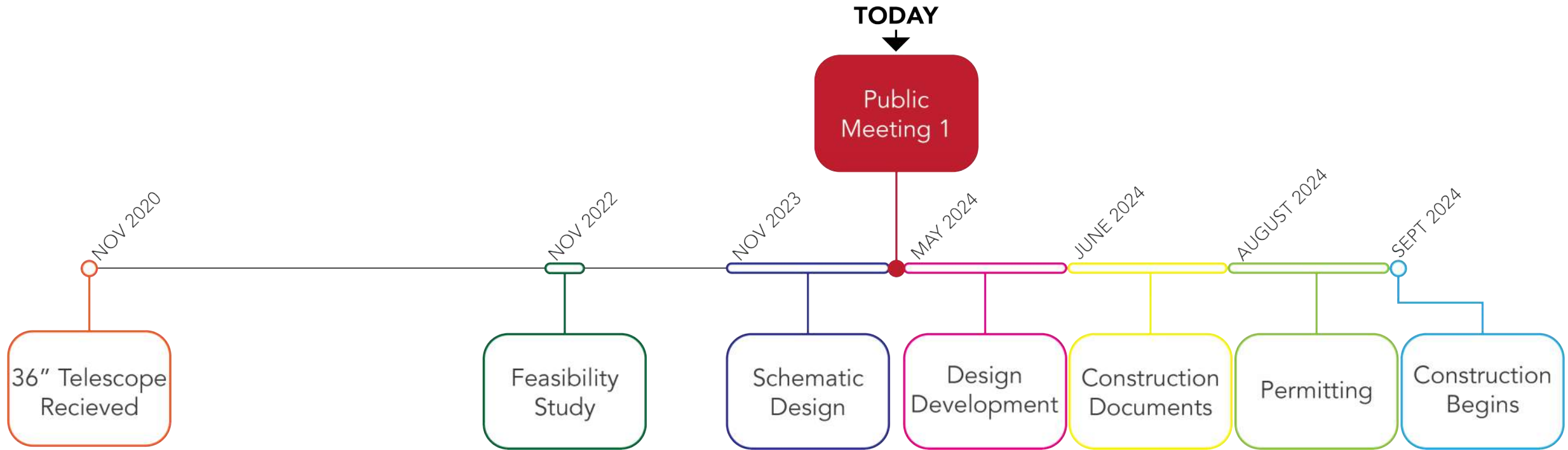
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Recent K-12 Outreach



DESIGN TIMELINE

Design Timeline



FEASIBILITY STUDY

SSA - 2023



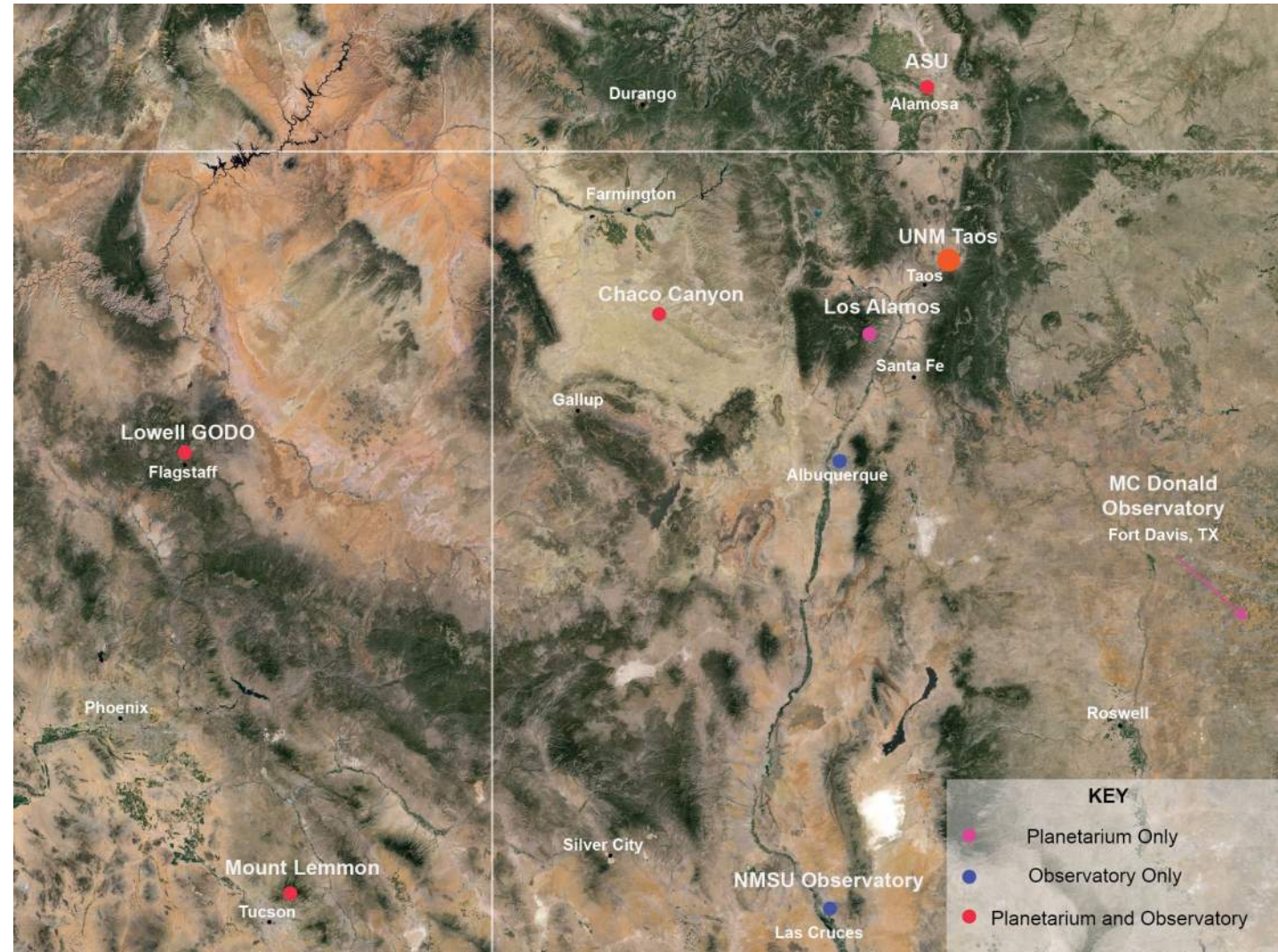
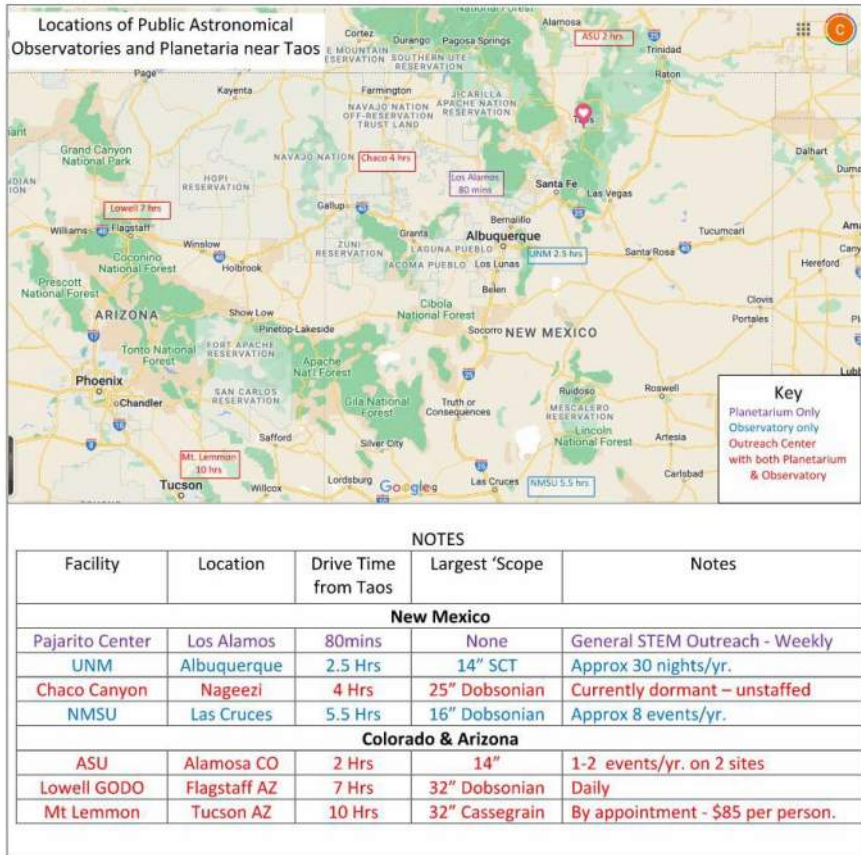
Telescope Collection



Existing Telescope Shed



Similar Facilities in the Region



Special Design Considerations

Light Shielding



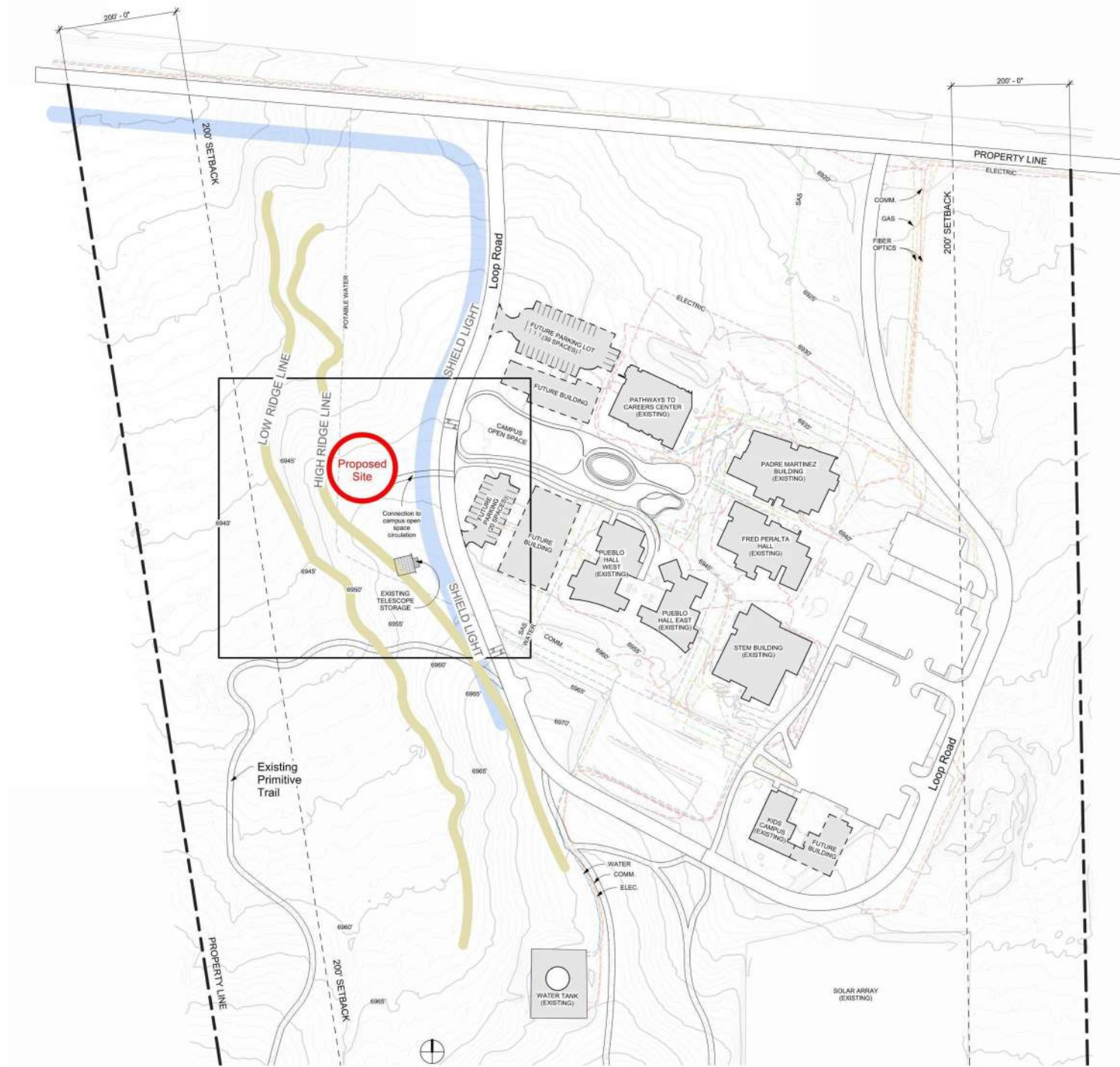
Campus Character



Site Accessibility



Proposed Site

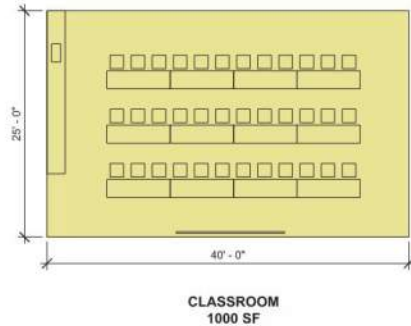


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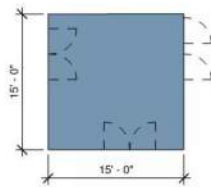
Spaces & Programming

The following diagrams describe the layout and size of the program spaces for the observatory, classroom, support spaces, exterior observation deck and outdoor planetarium.

Interior (Heated) Spaces

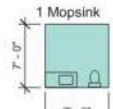
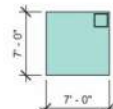


(45) Seats
(12) Tables
(2) 12' x 4' Whiteboard
20' x 2' Wide Counter with Lockable Base Cabinets and Sink



Provides entry from:
Observatory + Observation Pad

Provides entry to:
All

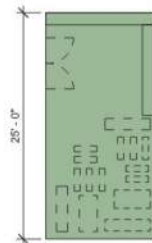


1 Unisex Toilet
1 Sink

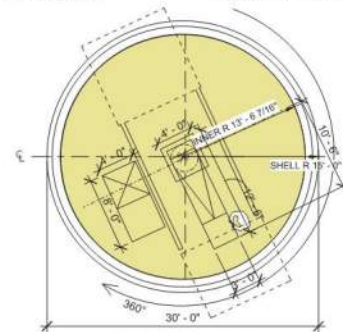
Interior (Unheated) Spaces



Houses all:
Mechanical equipment
Electrical equipment

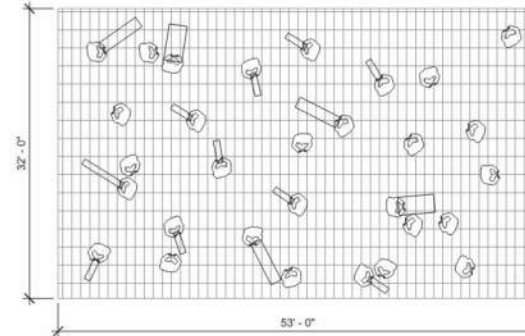


5 Large Telescopes
10 Medium / Small Telescopes
Shelving for Misc. Equipment
+ Space for Growth of Collection

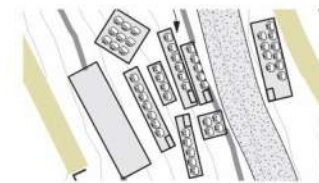


Sizing/rotational diagrammatic and approximate fitting for the 36" Dobsonian telescope inside 30' dome.

Exterior Spaces



5 Large Telescopes
10 Medium / Small Telescopes
30+ Visitors



Concrete Bleachers/Steps
50 Seat Capacity

INDOOR

Observatory 1205 SF

Classroom 2063 SF

OUTDOOR

Outdoor Ampitheather 50 People

Observatory Deck 30 People

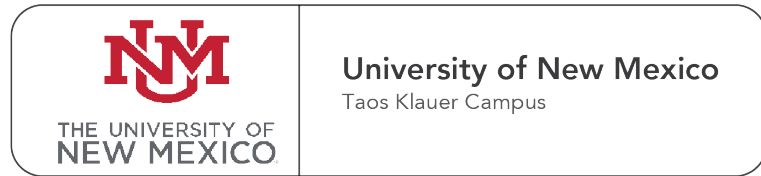


SCHEMATIC DESIGN

SSA – JAN 2024



Design Team



DESIGN TEAM

ARCHITECTURE

SSA | sam sterling architecture, llc.

SAM STERLING, AIA, PRINCIPAL

SAMANTHA TOQUINTO, PROJECT MANAGER

SCOTT STRIEGEL, CO-PROJECT MANAGER

CORE TEAM

SPECIALTY CONSULTANTS

LANDSCAPE

PLAND COLLABERATIVE

AARON ZAHM PLA, ASLA, LEED AP - PRINCIPAL

CIVIL + SURVEY

HIGH MESA CONSULTING GROUP

GRAEME MEANS P.E, S.E, LEED AP - PRINCIPAL

COST ESTIMATING

BALIS & COMPANY

JOHN BALIS PMP - PRINCIPAL

STRUCTURAL ENGINEERING

WORKPOINT ENGINEERING

BEN JOHN, P.E, S.E, LEED AP - PRINCIPAL / STRUCTURAL ENGINEER

GEOTECHNICAL

GEOMAT ENGINEERING

J. AARON EZZELL P.E. - MATERIALS PROJECT MANAGER /
BRANCH MANAGER

MECHANICAL/ELECTRICAL/PLUMBING

BRIDGERS & PAXTON

ERIC CONKLIN P.E. - PRINCIPAL MECHANICAL / PLUMBING ENGINEER
OSCAR URIAS P.E. - PRINCIPAL ELECTRICAL ENGINEER

IT+AV, RCDD LIGHTING & SECURITY

NV5 ENGINEERING

MARK GILLIS CTS, CTS-D - PRINCIPAL

SIGNAGE & WAYFINDING

SUSSMAN PREJZA & CO. INC.

MILES MAZZIE - PROJECT MANAGER

LEED/NET ZERO

JD PEARL, LLC + SSR

JARRET PEARL RA, LEED AP, BD+CM SITES AP - PRINCIPAL LEED
ANDY BROPHY PE, BEMP, LEED AP BD+C, O+M - SENIOR BUILDING
PERFORMANCE ENGINEER

OBSERVATORY CONSULTING

**OBSERVATORY SYSTEMS /
SEAWEST OBSERVATORIES**

J. AARON EZZELL P.E. - MATERIALS PROJECT MANAGER /
BRANCH MANAGER



New Spaces List vs. Old Spaces List

Feasibility Study

INDOOR

Observatory	1205 SF
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Classroom	2063 SF
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3268 SF

OUTDOOR

Outdoor Ampitheather	50 People
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Observatory Deck	30 People
------------------	-----------

Current

INDOOR

Observatory	2022 SF
-------------	----------------

Classroom	1763 SF
-----------	----------------

3785 SF

OUTDOOR

Outdoor Ampitheather	50 People
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Observatory Deck	80 People
------------------	------------------

Entry Garden Plaza	50 People
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OUTDOOR FEATURES

Project Location



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Observatory & Classroom



A LANDSCAPE PLAN — OBSERVATORY & CLASSROOM
SCALE: 1"=20'-0"



Campus Green



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A

LANDSCAPE PLAN – CAMPUS GREEN

SCALE: 1"=20'-0"

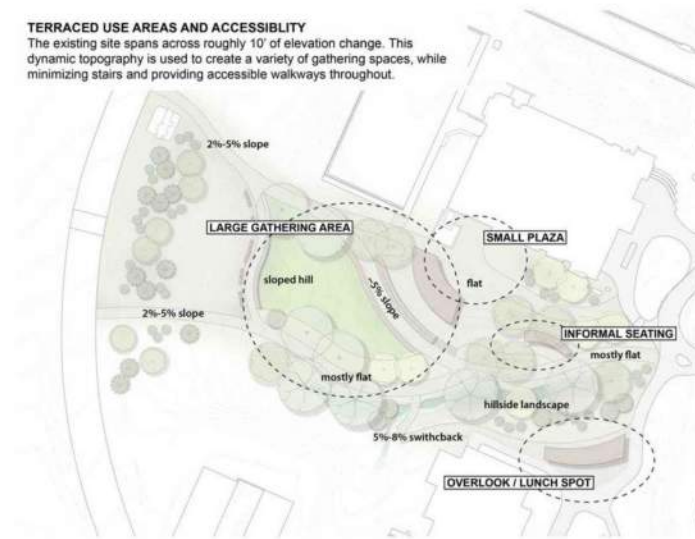
0 20' 40'



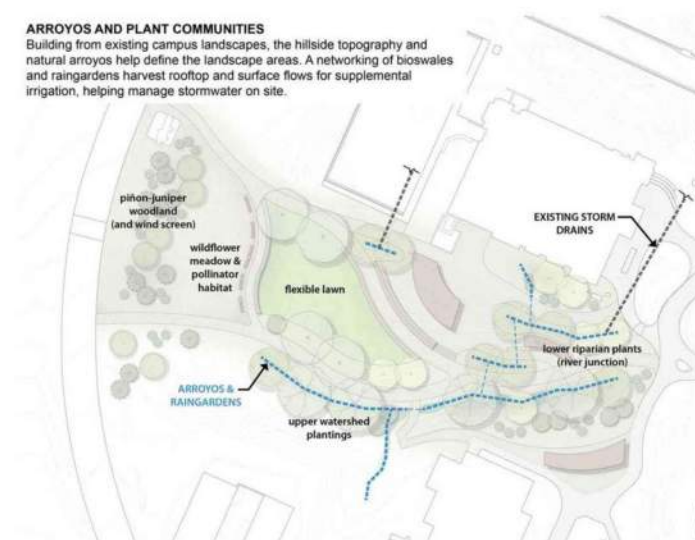
NORTH

Campus Green

TERRACED USE AREAS AND ACCESSIBILITY
The existing site spans across roughly 10' of elevation change. This dynamic topography is used to create a variety of gathering spaces, while minimizing stairs and providing accessible walkways throughout.



ARROYOS AND PLANT COMMUNITIES
Building from existing campus landscapes, the hillside topography and natural arroyos help define the landscape areas. A networking of bioswales and raingardens harvest rooftop and surface flows for supplemental irrigation, helping manage stormwater on site.



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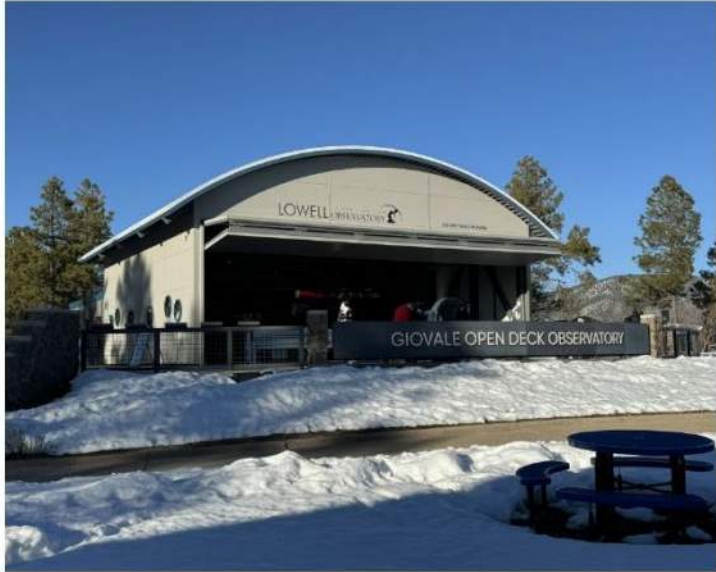
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SSA Precedent Study

Lowell Observatory

FLAGSTAFF, AZ - 02/18/2024



BARREL VAULT ROOF
Steel frame, white metal roof panels.

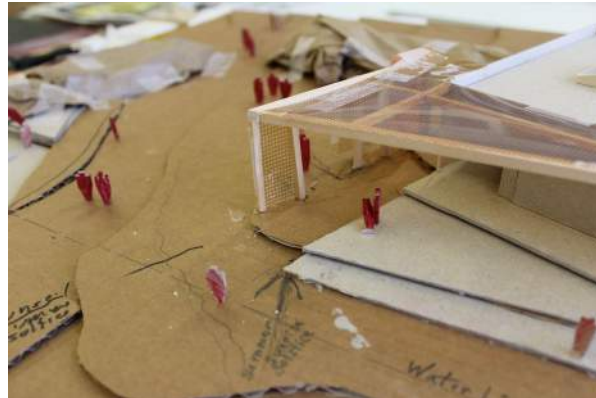
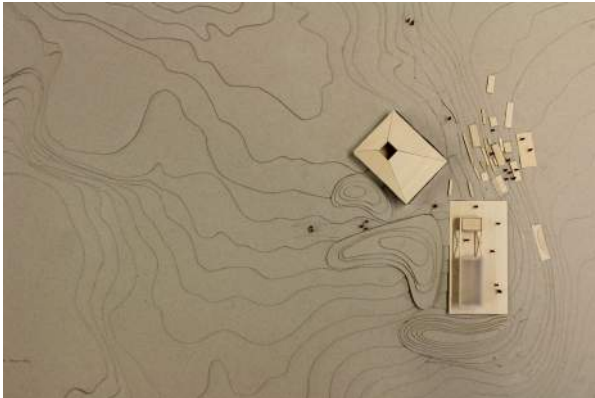
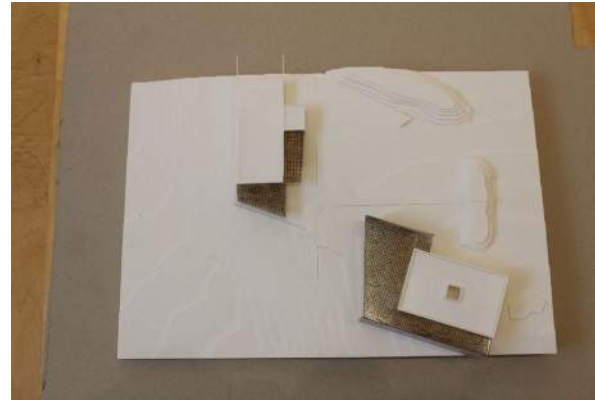


FLAT ROOFED STATIONARY PORTION
Closed position.



TELESCOPE DECK
Open position.
Great viewing angles south, east & west. Very limited northern view.

Physical Models



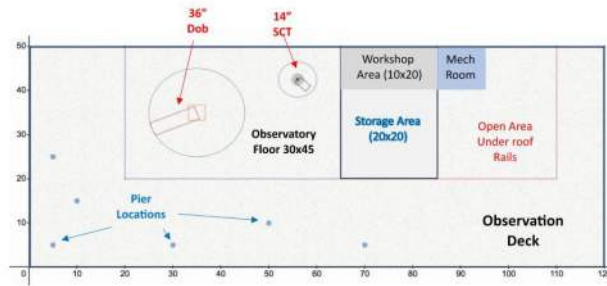
NOVEMBER – Start of SD

MARCH – Start of SD

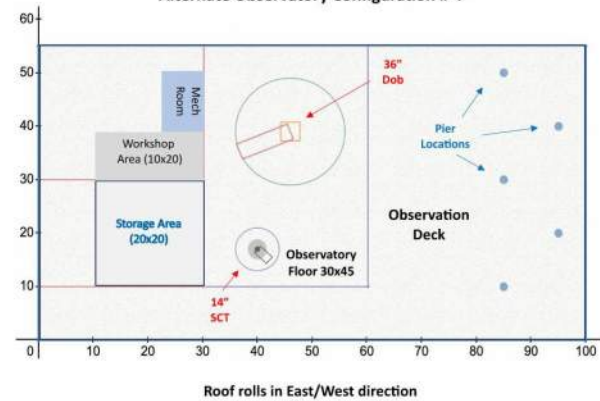
3D Print Refinement

Colin's Observatory Configurations

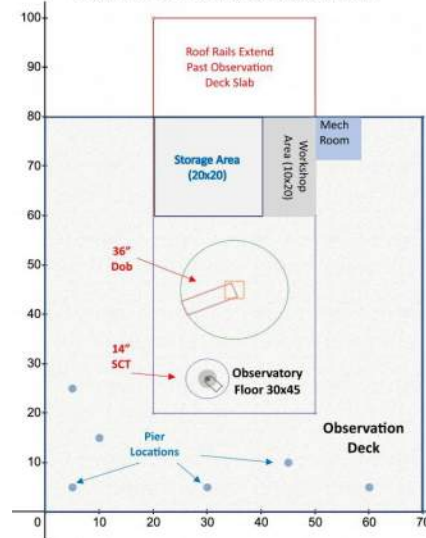
Alternate Observatory Configuration # 1



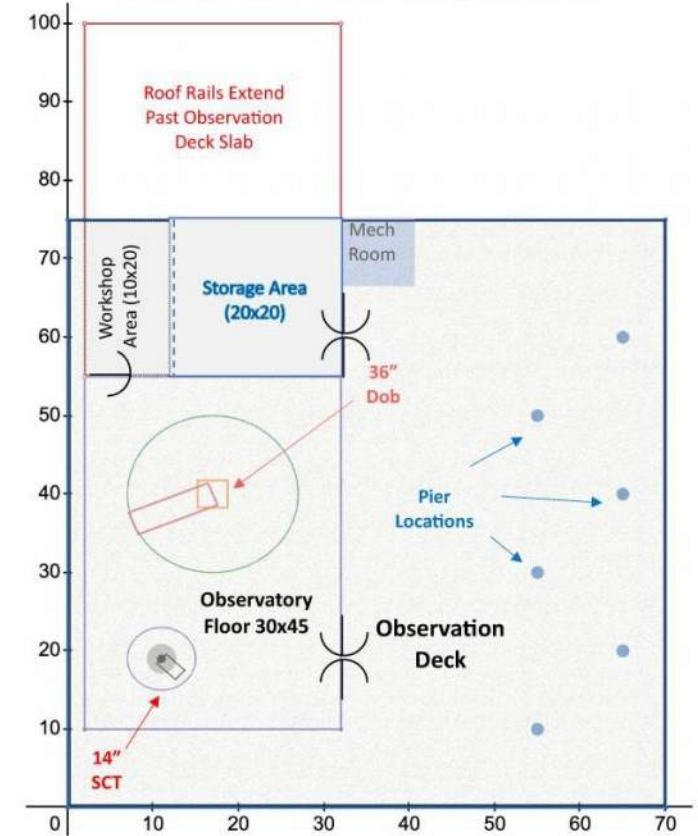
Alternate Observatory Configuration # 4



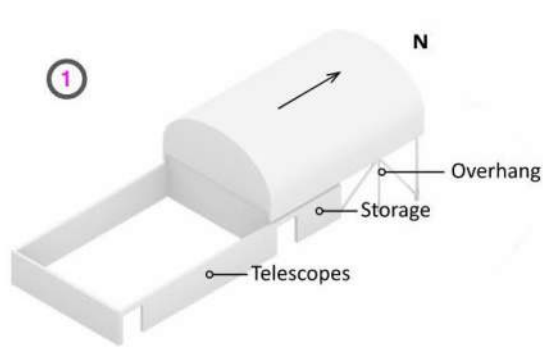
Alternate Observatory Configuration # 2



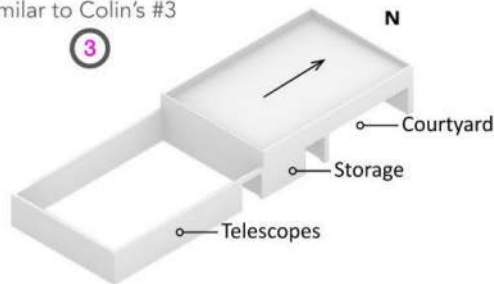
Alternate Observatory Configuration # 3



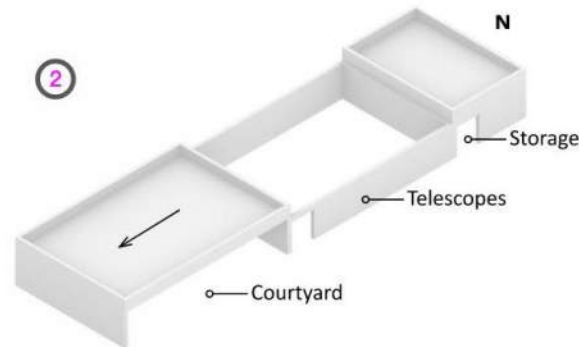
Observatory Roof Types



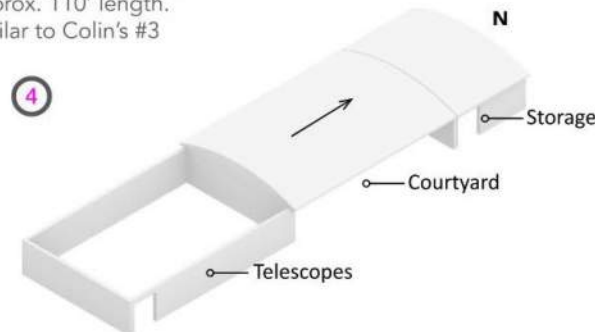
Quonset Hut Roof - Slides Over Storage
 -Quonset hut roof - cost effective + low maintenance.
 -Tall (approx. 25') to clear storage room, blocks view north.
 -Approx 90' length
 -Similar to Colin's #3



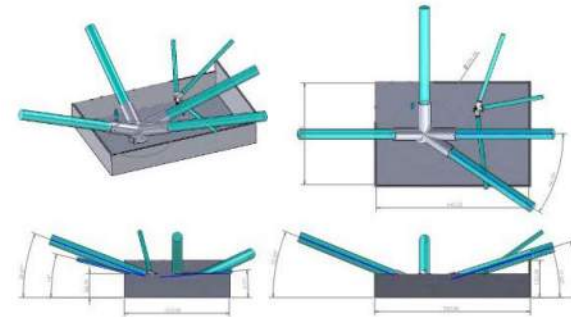
Flat Roof - Slides North Over Storage, Creates Courtyard
 -Could be mirrored w/ storage at south, obstructs view south.
 -Approx. 90' length.



Flat Roof or Low Vault - Slides South, Creates Courtyard
 -No roof overlap - simplifies roof but obstructs view south.
 -Approx. 110' length.
 -Similar to Colin's #3



Low Barrel Vault Roof - Slides North, Creates Courtyard
 -Roof at north when open - maximizes views angles.
 -Storage & telescopes scopes separated.
 -Approx. 110' length.



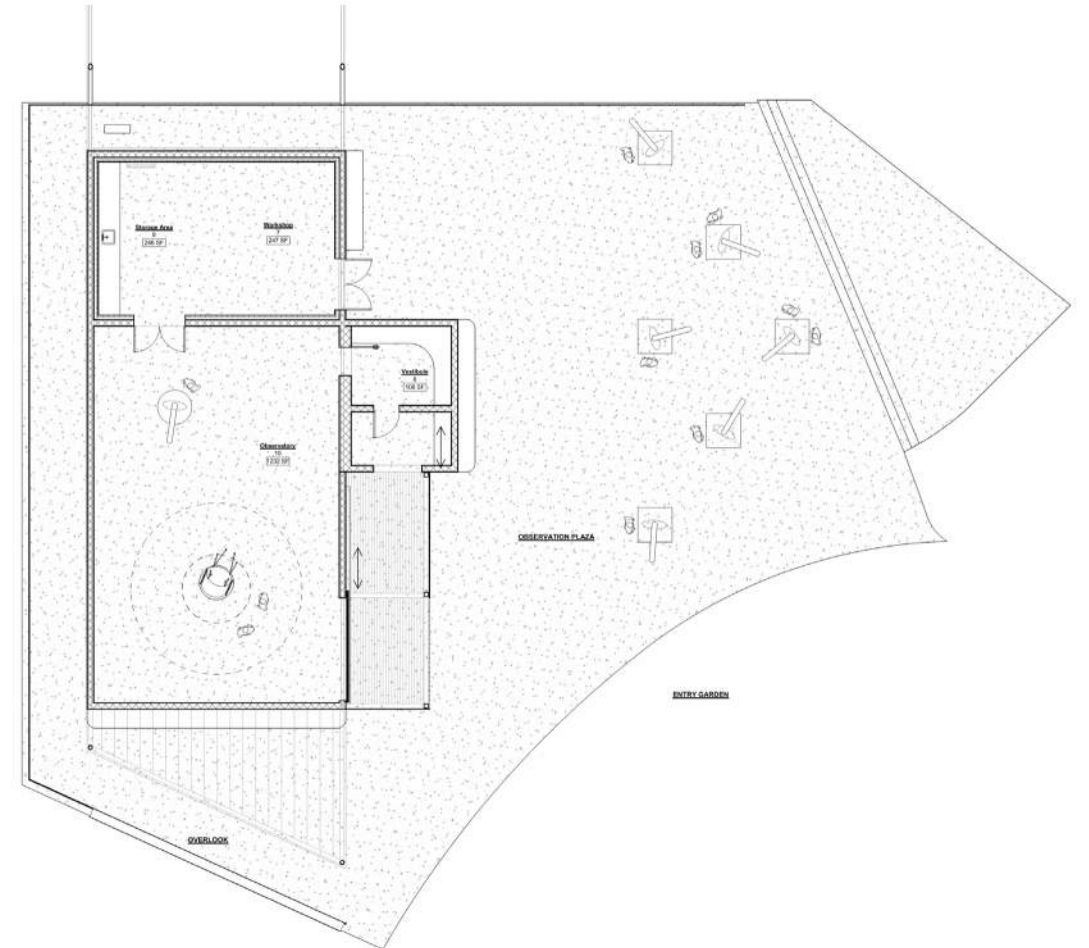
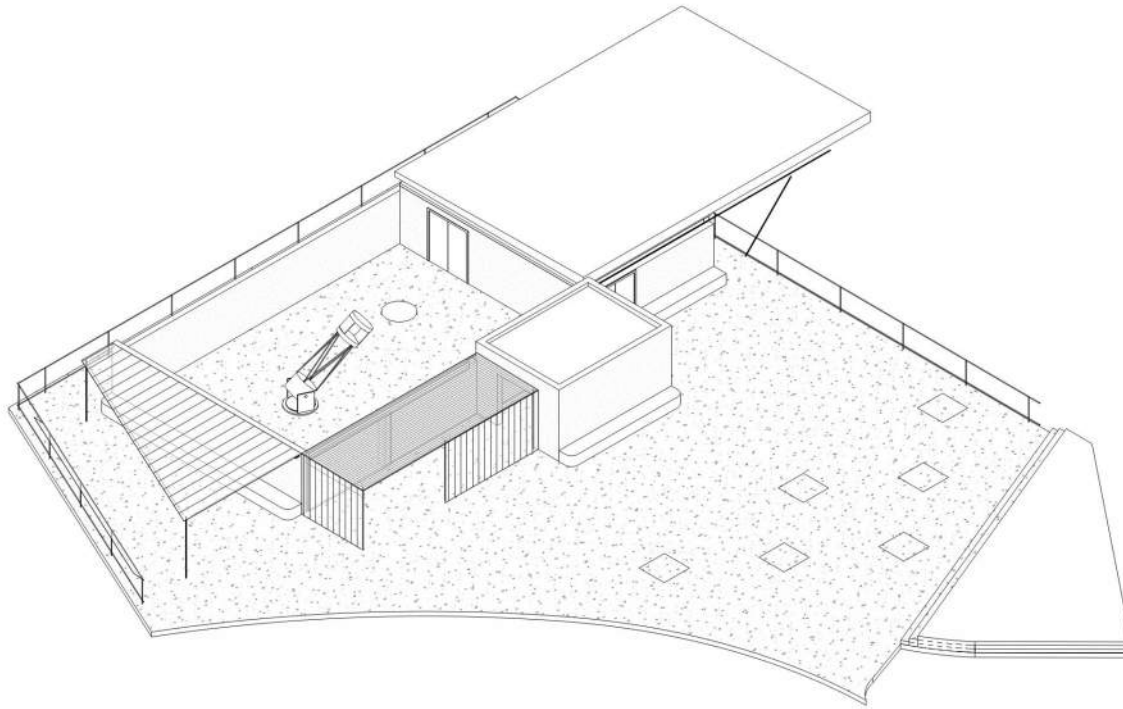
SeaWest Telescope Angle Diagram
 Recommends a wall height of 7'4" at the South, East, and West, 11' at the North.

Raised to 8' 4" (7' door + 1' roof track beam)



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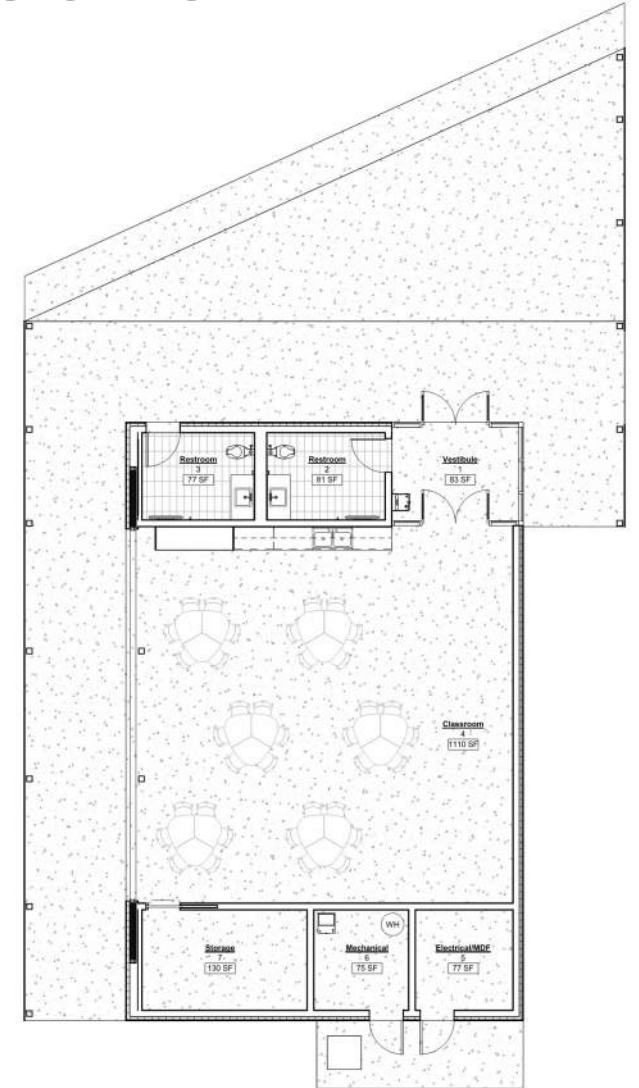
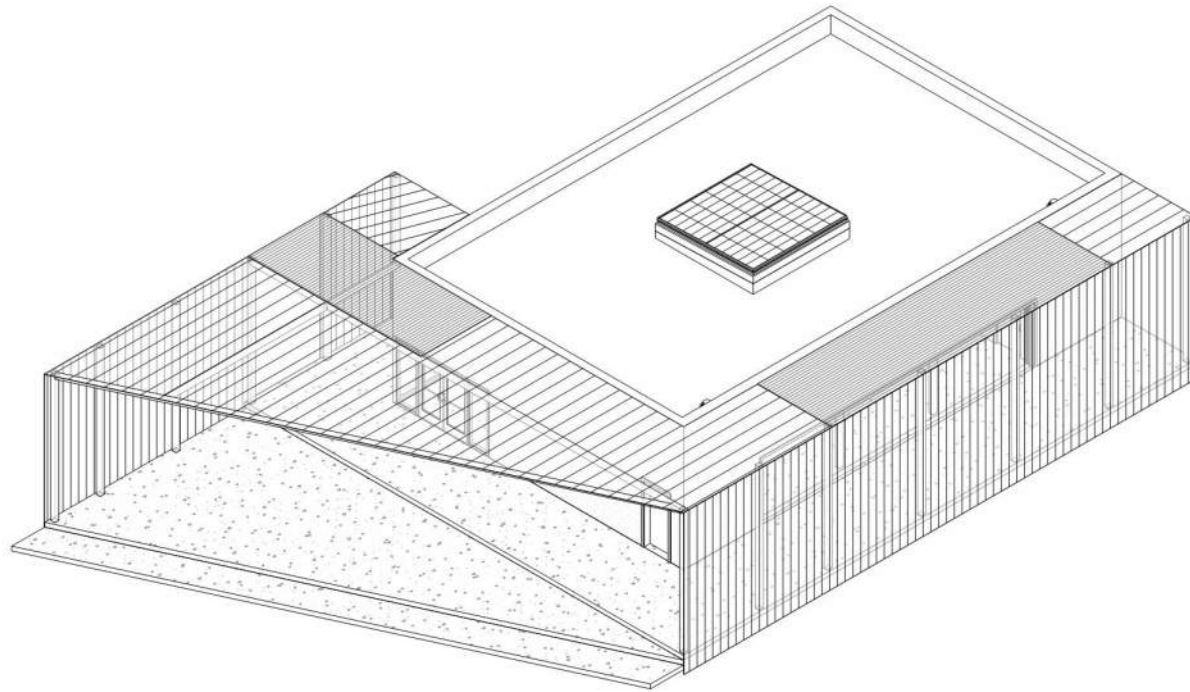
Observatory Floor Plan + Isometric





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Classroom Floor Plan + Isometric





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UNM-Taos Material Matrix

	EXTERIOR	INTERIOR	CONTEXT	VEGETATION	SEATING/PUBLIC USE	NATURAL LIGHT	NATURAL MATERIALS
PATHWAYS							
PUEBLO HALL							
PERALTA HALL							
MARTINEZ HALL							

