

Testing the Greek Landscape

By: Daniel Lamp



Figure 01: A view of one of the Meteora monasteries in the morning mist. This image can be read as the reason for the design exercise; a building sits in an extreme landscape in such a way that its presence extenuates and compliments its surroundings. Meteora, Greece is a composition of building and rock working in concert. [D. Lamp, 2006]

ABSTRACT

Title of Document: TESTING THE GREEK LANDSCAPE

Daniel Robert Lamp
Master of Architecture, May 2007

Thesis Directed By: Professor Karl DuPuy, AIA
School of Architecture, Planning, and
Preservation

This thesis is an exploration of the effects of site upon building design and form. The purpose of the exercise is to demonstrate the transformative influence of terrain upon every other aspect of the design process. The region of Meteora, Greece is selected because it offers a variety of extreme topographic conditions within a concentrated area.

The test is designed scientifically, using program as the constant and terrain as the variable. Four specific sites are used within the greater area, each with very different terrain. The variety of topography allows the comparison of four instances of building to site interaction. A program appropriate to the region is a monastery, which is then applied to each site as a case study. The design process is used to resolve a total of six resultant issues for each site: building access, massing, character of the monastery, structural system, construction methodology, and aesthetic response to site. These six issues are then compared across the examined sites to demonstrate the governing role of topographic interface in architectural design.

TESTING THE GREEK LANDSCAPE

by

DANIEL ROBERT LAMP

Thesis submitted to the Faculty of the Graduate School at the
University of Maryland, College Park in partial fulfillment
of the requirements for the degree of
Master of Architecture
2007

Advisory Committee:

Professor Karl DuPuy, Chair
Professor William Bechoefer
Professor of the Practice Peter Noonan

© Copyright by

Daniel Robert Lamp
2007

DEDICATION

For Angela.

Of course... we're in over our heads.
That's our style, isn't it?

ACKNOWLEDGEMENTS

My sincerest thanks to the following people for their support and contribution to what was an enormous undertaking. May help find you when you need it too.

Kris McIntyre

Elizabeth Alexandra Maeder

Kimbery Allison Singleton

Brittany Loanne Williams

Jamie Brady

Nastaran Zandian

Artur Kalil

Cole Major

Allan Su

Debbie Bauer

John Michael Talbott

Rawle Dovendra Sawh

Carl Lostritto

Jason Cheung

TABLE OF CONTENTS

List of Figures	vi
Introduction.....	1
Chapter 1 – Site Selection.....	5
Chapter 2 – Site Analysis.....	11
Political Situation	12
Transportation	15
History	19
City of Kalambaka	21
Village of Kastraki	28
Tourism Issues	31
Existing Monasteries	34
Pinnacle Sites	38
Precipice Sites	39
Ledge Sites	40
Cave Sites	41
Chapter 3 – Site Specifics.....	42
Site A: Alyssos’ Mouth	47
Site B: Pantocrator	49
Site C: Cat’s Church	52
Site D: Panorama	54
Chapter 4 – Building Program.....	56
Common Program	58
Rooming Program	62
Boarding Program	65
Work Program	66
Miscellaneous Program	68
Chapter 5 – Design Strategies.....	70
Key Logistical Issues	72
Site A: Alyssos’ Mouth	74
Site B: Pantocrator	76
Site C: Cat’s Church	78
Site D: Panorama	80
Chapter 6 – Design Conclusions.....	81
Bibliography	

LIST OF FIGURES

- 01 Roussanou Monastery in the morning mist
- 02 Images of some of the rock formations
- 03 Varlaam Monastery amongst the rocks
- 04 Varlaam Monastery, as seen from Great Megaron
- 05 Table: administrative zones of Greece
- 06 Map of Greece indicating Thessaly
- 07 Map of the region of Meteora
- 08 Map of Greece indicating major roads
- 09 Map of Greece indicating train lines
- 10 Map of Kalambaka indicating land usage
- 11 Map of Kalambaka indicating major open spaces
- 12 Map of Kalambaka indicating hotel locations
- 13 Pictorial overview of Kalambaka tourism
- 14 Kalambaka Old/New city comparison
- 15 Pictorial overview of Kastraki
- 16 Chart: Tourist groups
- 17 Chart: Hotel overview
- 18 L. Heuzey's 1849 monastic survey
- 19 Map of Meteora indicating monastery locations
- 20 Pictorial overview of pinnacle monasteries
- 21 Pictorial overview of precipice monasteries
- 22 Pictorial overview of ledge monasteries

23	Pictorial overview of cave monasteries
24	The ruins of the Pantocrator Monastery
25	Table: List of site selection criteria
26	Table: List of site categorizations
27	Map of Meteora indicating intra-valley transportation
28	Map of Meteroa indicating the locations of four chosen sites
29	Site A: Alyssos' Mouth page 1
30	Site A: Alyssos' Mouth page 2
31	Site B: Pantocrator page 1
32	Site B: Pantocrator page 2
33	Site B: Pantocrator page 3
34	Site C: Cat's Church page 1
35	Site C: Cat's Church page 2
36	Site D: Panorama page 1
37	Site D: Panorama page 2
38	Workshop of the Megaron Monastery
39	Approach to Agias Triada Monastery
40	Cloister at Agios Stephanos Monastery
41	Observation area at Agios Nikolaos Anapafsas Monastery
42	Workshop at Agios Nikolaos Anapafsas Monastery
43	Exterior gardens at Agios Stephanos Monastery
44	Overview of Agios Nikolaos Anapafsas Monastery
45	Table: List of key logistical issue in design

46	Table: Matrix layout of design proposal in parallel sequences
47	Diagrammatic massing strategies for site A
48	Diagrammatic access strategies for site A
49	Diagrammatic massing strategies for site B
50	Diagrammatic access strategies for site B
51	Diagrammatic massing strategies for site C
52	Diagrammatic access strategies for site C
53	Diagrammatic massing and access strategies for site D
54	Rendering of one of the proposed monasteries
55	List of major changes incurred in the design process
56	Diagrammatic plan of Rila Monastery
57	Monastery diagrams
58	Preliminary analysis of site D
59	Applying the program to the site
60	Views of final massing
61	Partial floor plans set of site D
62	Rendered section through site D
63	Preliminary analysis of site C
64	Further analysis of site C
65	Views of final massing
66	Partial floor plan set of site C
67	Rendered section through site C
68	Programmatic analysis for site A

- 69 Diagram of the cloister arrangement for site A
- 70 Partial floor plan set for site A
- 71 Rendered section through site A
- 72 Perspective view of site A

Introduction: Testing the Greek Landscape



Figure 01 (from cover): A view of one of the Meteora monasteries in the morning mist. This image can be read as the reason for the design exercise; a building sits in an extreme landscape in such a way that its presence extenuates and compliments its surroundings. Meteora, Greece is a composition of building and rock working in concert. [D. Lamp, 2006]

The purpose of this exercise is to demonstrate the role of extreme terrain in the process and product of design. In order to conduct this sort of experiment, a constant is repetitively applied to a variable, which is different each time. The constant in this case is a building program, and the variable is the topographic condition into which it is inserted. Multiple tests are done using different variables, which are different terrain configurations. The results are examined according to specific criteria, which can then be compared across the multiple iterations of the experiment. That examination is the means through which conclusions are drawn.

The process of selecting and analyzing these multiple sites is the subject of three chapters. Chapter one begins the process by explaining the type of sites that the

thesis requires. It is preferable that these sites be very dissimilar in terms of specific terrain, yet very similar in nearly all other regards, as to avoid trying to compare design solutions that exist in very different climates or cultures. As a consequence, the idea emerges that one area of widely varying terrain is preferable. Meteora, an area in Central Greece, fits that description and is identified as a suitable location. Meteora has also precedent in the form of cliff top monasteries that have been constructed there in much the same manner that the thesis seeks to test; indeed, the images of these cliff-side monasteries were generators of the desire to test extreme terrain as a design governance.

Chapter two continues the process of site exploration with a survey of the region of Meteora in terms of geography, political situation, history, urban settlements, and the existing monasteries as local precedent. One of the tenants of the survey of tourist infrastructure and hotel accommodation is that one demographic in particular, the backpacker and climber group, is wanting of suitable accommodations. This is a function that the monasteries themselves used to provide in the form of Spartan hostelling for those hikers that made the trip to find them. This is posited as programmatic function that should be incorporated as a part of the building program.

Chapter three concludes the site analyses with the identification of four specific sites within the Meteora region to build-upon. Four categories of site are defined, and a site that exemplifies each type is chosen for further study. The selection of the sites is based upon maintenance of a representative sample of terrain conditions found in Meteora, upon which the older monasteries have been

constructed. Each site is depicted graphically, with an estimated maximum build-out, and any issues or concerns specific to each location.

Having established four reasonable sites, chapter four states and analyzes a program for the proposed monasteries. The programmatic needs are addressed in three parts: spaces for residences, spaces for worship, and spaces for vocation. The program is qualitative rather than quantitative, as the nature of each site expected to inform issues such as sizes and adjacencies of program pieces. The point is to demonstrate topographic influence on the design process and product, and not necessarily to design an innovative monastery or raise issues about the typology. The program in this regard is a vehicle with which to conduct the design exercise.

Chapter five is a statement of design strategy for each site. Since demonstration of influence and governance throughout the design process is key, the overall sequence of design is categorized according to significant issues of logistical possibility, methodology, and appropriateness to the site. This chapter goes so far as to suggest diagrammatic solutions to the first two sequential issues, which are possible building massing and access to the site. This series of issues is design to inform the next in a cascading sequence, such that final issues of preference are informed by previous issues such as what is or is not possible on a given site. The design process is presented as a matrix of four parallel paths of development that intersect six logistical issues in sequence. This matrix allows for display of an individual site's complete process simultaneously with display of how a given issue, for example site access, has influenced each site differently.

The exercise concludes at chapter six, which states the design solutions according to the matrix prescribed in the previous chapter. Issues of success and failure are addressed in a number of ways: some sites are able to fulfill the program in manner that is necessarily beneficial to Meteora as an aesthetic composition, and some are not. Some sites clearly demonstrated that terrain informed their being, and others demonstrated that terrain had a negative impact on their development to the point of impossibility. Lastly, there is an element of programmatic success without the sense of spirit or composition that is co crucial to Meteora; in other words, it is possible to build on some sites, but it detracts from the region to do so.

Again, the purpose of this exercise is to demonstrate the role of extreme terrain in the process and product of design. The following thesis is merely one way to do so, and in one isolated corner of the world. It is a sort homage to a sensation; the sense of amazement that draws tourists to the region is made of equal parts landscape and building, and it is powerful. The fact that humans have built enduring structures in nearly impossible places is a phenomenon that this exercise seeks to explore. How and why this is done is a matter of history; whether or not it can or should be replicated is the issue at hand.

Chapter 1: Site Selection (Phase I)

This chapter...

... explains the qualifications for site selection.

... identifies Meteora, Greece as a suitable location for study.

... submits the cliff top monasteries found there as a precedent.

... makes the case for a new monastery as a program to test against the terrain.



Figure 02: Image of some of the rock formations of Meteora, Greece

[D. Lamp, 2006]

This thesis is an exploration of the effects of site upon building form. To rephrase, this thesis is site driven, and the actual building becomes the resultant at the end. The first step is to choose multiple sites based on a variety of terrain types.

First and foremost, the sites selected must reflect a wide variety of extreme terrain. Since the point of the exercise is to try to isolate topography as a design variable, other aspects of potential sites should be as consistent as possible. This means that issues such as culture, material palettes, and meteorological patterns, should be roughly the same in each site. Thus, it makes sense to consider a single, limited area that offers the option of building in several sites, relatively close together. This approach then allows for different topographic instances of essentially the same site, differing only in terms of access and orientation to the sun.

The area known as “**Meteora**” in central Greece is ideal for study because of its wide variety of extreme topography in a relatively small area. In roughly 4 square kilometers, the terrain includes fertile agricultural plain, a major riverbed, lush old growth forests, prairie, and most importantly spectacular rock formations that rise abruptly from the plain at their feet, some over 1000 feet high. Many historians and explorers have spent countless words describing the unusual and awe-inspiring geological oddity that is Meteora. Consider the field report of George Curzon, one of the first western explorers to make it to the interior of what was at the time a closed Ottoman province, who wrote the following sensational account of his first sight of Meteora:

“For over an hour before reaching our destination the mountain range bounding the plain on the North could be seen to terminate abruptly in a series of detached rocks and burly mountain-spurs, rearing their bare and contorted heads above the valley bottom, where in a wide pebbly bed the Penius [river] furrowed its vagrant way. It was as though with a monstrous scalpel knife the mountain had at some time been flayed alive, and then with stokes of a titan’s axe gashes had been hewn in the excoriated mass, and portions of it detached from the remainder, the severed lumps upstanding in grotesque shapes of pinnacle and sugar loaf and columnar spire. At the foot of the principal cliff lies the trim little town of Kalambaka, the rock face, pitted and pocked with natural cavities, rising sheer behind it to a height of over one thousand five hundred feet above the plain. A little to the right stands an even more uncommon brotherhood of rocks, projecting to a great height like a cluster of megalithic and inconceivable boars’ tusks from the plain; and on the summit of these cones could be seen outlined against the sky the tiled roofs and towers of Hagias Trias and Hagia Stefanos, two of the nearest monasteries of Meteora.”
– George Curzon M.P., 1891¹

In addition to its startling topography, (and as Mr. Curzon alludes to above,) the area is home to a series of Byzantine monasteries built high atop or on the sides of the rock pillars. The term “Meteora” was most likely coined by the monk Athanasius around the year 1344AD,² upon founding what would become the largest monastery in the area. The word translates roughly as “suspended in the air,” which refers, of course, to the monasteries perched upon the summits and sides of the high rock formations. The area is as famous for these unique structures as it is for the improbable geology. At the height of Orthodox monasticism³ there existed twenty-four monasteries, each occupying a high plateau, cave, or perch among the rocks. “The most improbable places were for their purposes the choicest.”⁴ Today there are six functioning monasteries, which are open to the public and have become major

¹ Quote originally from The English Illustrated Magazine, April 1891

² Whitehouse, 35

³ The most complete survey of the Meteora monasteries was published in 1864 by the French archaeologist L. Heuzey.

⁴ Quoted from Curzon, 502

tourist draws. Steps have been hewn into the rock face to enable guests to reach these once literally inaccessible buildings. The main economic engine in the region is now tourism, and the monasteries have become unique tourist traps manned by skeleton crews of monks and nuns. Serious monastic study in Meteora is now very limited.



Figure 03: Varlaam Monastery, as seen from the observation area at the nearby Great Megaron Monastery. The image is meant to convey the character of the Meteora monasteries and their interaction with the rocks upon which they sit, which is crucial to the exercise at hand.[D. Lamp, 2006]

These **monasteries add the element of precedent** to the study. Type study is an issue addressed more thoroughly in chapter two, however it can be stated up front that the Meteora monasteries are an architectural form that is drawn to extreme terrain for defensive (if not aesthetic and spiritual) reasons. In essence, Meteora is a Byzantine of example of the sort of experiment that this thesis conducts; the

monasteries constitute a variety of the same building type engaged in different terrain types within the same area. The precedent is local and very relevant.

The site is also geologically stable in terms of the rock formation. Unlike other areas with similar topography and built form, the twisted rock formations are made of hardened, conglomerated minerals that have withstood erosion and earthquakes for millennia. (In fact, the rocks appear the way they do because deposits of softer stone have been eroded away. All that remains is that which does not easily erode.) For instance the rock formations at Cappadocia, in nearby Turkey, are comprised of much softer sandstone and are highly susceptible to wind and rain erosion. As a result, similar Byzantine cave structures created there are in great danger of collapse due to the instability of the mountain in which they were built.

As already stated, the monasteries really no longer function in the traditional sense, but serve as tourists' attractions instead. This is due to several factors, but most notably the slow decline in monasticism that has been ongoing for several hundred years. As early as 1899, another explorer noted that the main monastery was "there was an air of poverty and ruin about the place that only too surely emphasized the fact that its days were numbered."⁵ As time goes on, fewer and fewer young men enter the orthodox seminary. The monasteries here have escaped the fate of so many others, meaning ruin, with the embrace of tourism. These once inaccessible peaks are now host to over 1,000,000 tourists a year. Despite their popularity, there are increasingly few clergy to staff the buildings, and three monasteries have closed in one generation due to insufficient staff. (These buildings continue to deteriorate due for lack of maintenance.) These are unique buildings in a unique landscape, and as

⁵ Markham, 514

such require special maintenance and protection. UNESCO bestowed the title of World Heritage Site onto Meteora in 1988, reflecting the status of both the rocks and the monasteries. Still, tourism numbers continue to grow and monks continue to disappear. While beautiful, these monasteries are relics of a bygone era, and what few monks enter the seminary are assigned to more modern, relevant facilities. Traditional tasks such as wine making and farming (on the valley floor) are no longer practiced. To choke back tourism is to cut off the very source of relevance that is keeping Meteora alive, physically and culturally, however the buildings and clergy cannot sustain the onslaught much longer.

Thus, in addition to a testing ground for a hypothesis, Meteora provides an opportunity for designed intervention. Besides issues of site, the construction of a new monastery demands examination of the issues of tourism and relevant contemporary monastic housing. The existing buildings are not conducive to the furthering of tourism or monasticism separately, and certainly not both.

In conclusion, Meteora is an ideal setting to in which to undertake the analysis at hand. First, the region provides a range of different topographic conditions (and potential sites) within a compact area. Second, the presence of the existing Byzantine monasteries signifies the area's historic role in the integration of building and extreme terrain. Lastly, the need for updated monasteries serves as site-tailored building program. Thus, the issue of what to build moves from an arbitrary constant to a native function of the region. A monastery in a defining cliff top setting is the ideal program for the assignment.

Chapter 2: Site Overview (Phase II)



Figure 04: View of the Varlaam Monastery from the Megaron Monastery. This photo is a good indication of exactly how dense these monasteries are within a given area; Roussanou Monastery is visible on a rock in the background, and Agia Triada Monastery is barely visible atop the line of rocks in the distance. [D. Lamp, 2006]

This chapter...

- ... defines Meteora as a set of geological features and associated habitation.
- ... examines the natural and man-made fabric of the region, including the two settlements that function as gateways into the site.
- ... analyzes how the region facilitates the tourist industry
- ... provides an overview of the Byzantine monasteries, and their role as precedent for the study at hand.

There is no official boundary for an area called “Meteora.” It is an area of interest located within other administrative zones. There is however a recognizable common definition of the rough site boundaries in the form of discreet elements. Meteora can be understood as the following things: the rocks, which stand apart starkly from the landscape; the monasteries, which are attached to the rocks; the valleys between the rocks, which are lush and a significant contrast to the agricultural plain; and the towns at the base of the rocks, Kastraki and Kalambaka.⁶

The region of Meteora is not a political entity in-and-of itself, but rather a set of distinctive natural features. The site lies within the modern administrative “periphery” of Thessaly, which is similar to a U.S. state. Thessaly as a state is quiet, despite the capitol Larissa, which is Greece’s fifth largest city with approximately 125,000 people.⁷ Larissa is far enough from the site at hand as to not be a factor except in terms of transportation. The periphery is largely rural and very agricultural. As seen from the air it resembles a blanket of patchwork farms. The closest city of size is Trikala, the capitol of a “Prefecture” (equivalent to a U.S. county) by the same name. Trikala has approximately 45,000 inhabitants and is a quiet, unassuming town in the middle of the plain.

Comparative Administrative Divisions (Largest to Smallest)	
Greek Administrative Zones	Unites States Equivalent
Peripheries (13 total)	State
Prefectures (3-6 per periphery)	County
Provinces (2-10 per prefecture)	(Large) Township

Figure 05: shows the structure of Greek administration of territory. Meteora is an unofficial area within Kalambaka Province, Trikala Prefecture, Thessaly Periphery.

⁶ Note: UNESCO must clearly draws what it considers the boundaries of inclusion for the World Heritage Zone. That organization’s definition only includes the village of Kastraki, not the city of Kalambaka. It is unclear how why that should be, however Kastraki as a settlement is made up of substantially different building types and materials, many of which are foreign to Greece in general.

⁷ <http://www.citypopulation.de/Greece.html> October 15, 2006

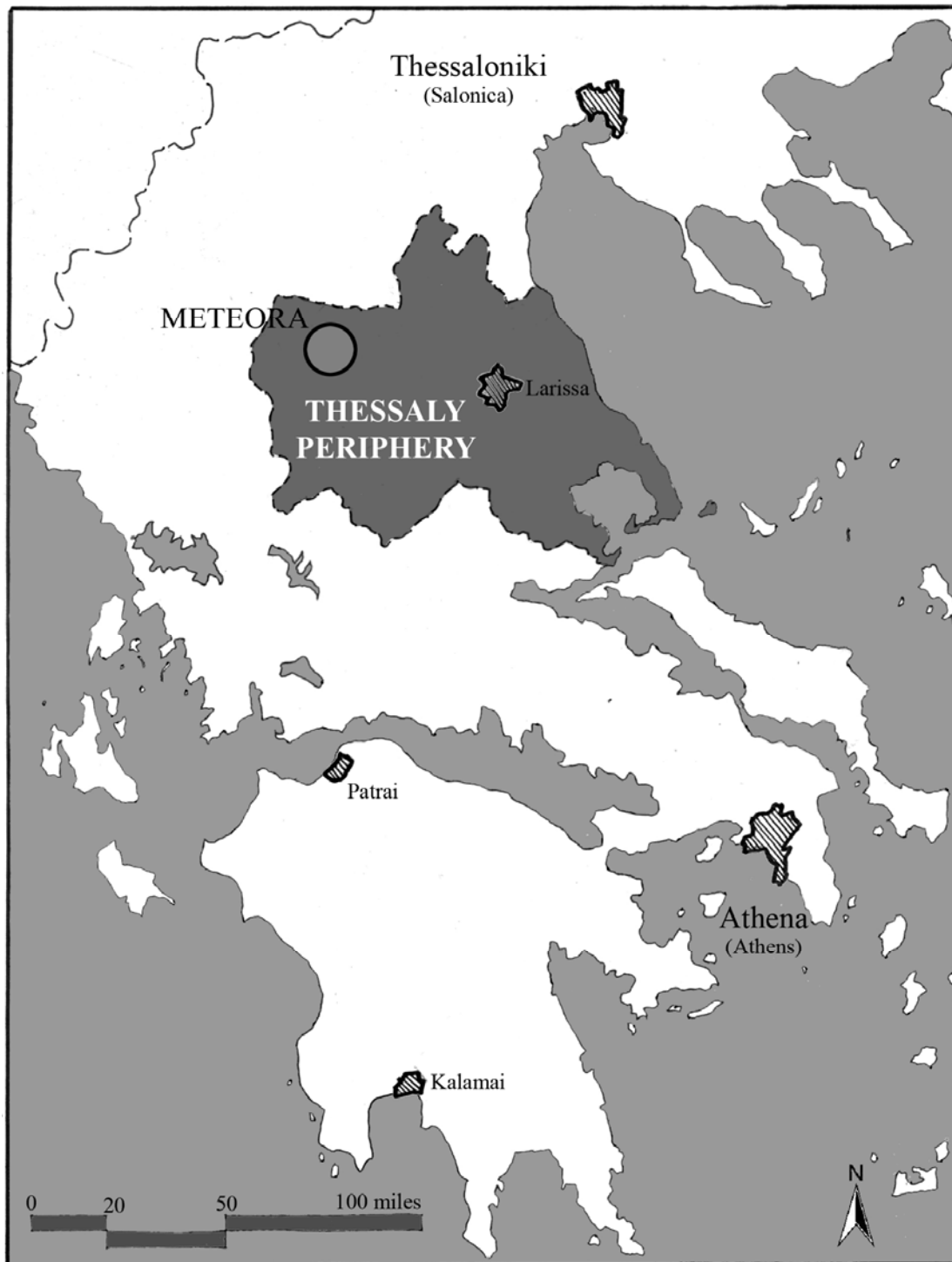


Figure 06: A map of Greece indicating major population centers and the extents of the Periphery of Thessaly at the center. The Meteora region is labeled in the western portion of the periphery. The area of concern is at the line where lush, fertile plain meets rugged mountains. That, and its centrality to the Greek landmass have made it an important territorial holding since ancient times. [Source: D. Lamp]

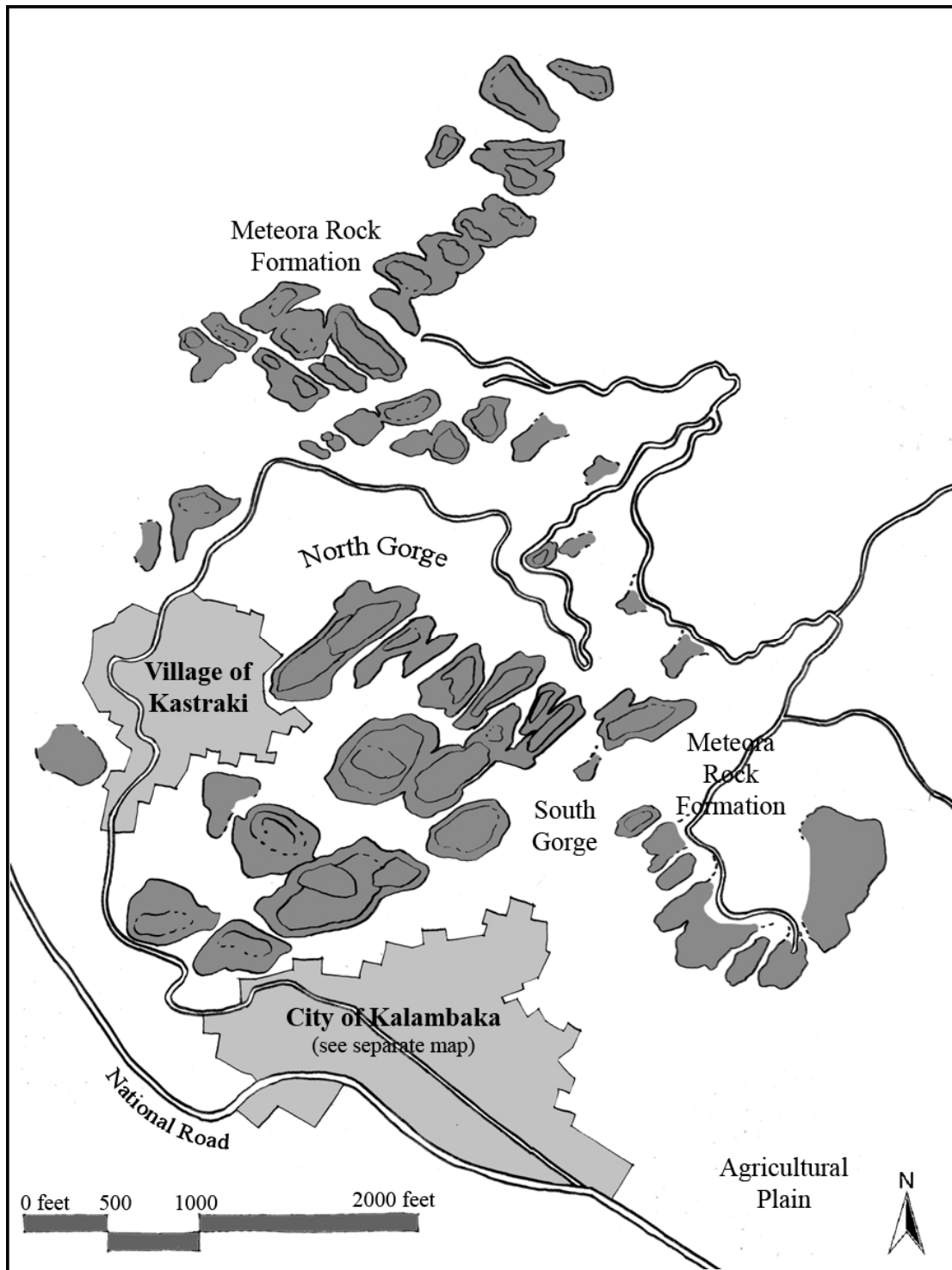


Figure 07: Map of the Meteora region, showing the relationships between the various rock formations, roads built between them, and the two habitations of Kastraki and Kalambaka. [Source: D. Lamp]

While the smaller area of Meteora can be extremely rugged, the remainder of Thessaly is quite flat and agricultural. The Plain of Thessaly begins at the foot of the rock peaks of Meteora and stretches south and east. Mountains extend north and west, and then again on the south side of the periphery. The land that today comprises Greece is over 80% mountainous,⁸ leaving little arable land elsewhere. Thus, the Plain of Thessaly acts as Greece's breadbasket, a flat plain bounded on three sides by mountains and the last by the Aegean Sea. Meteora commands an excellent view of the plain from its northernmost extremity.

Greece is not a country known for its efficient or extensive transportation network, especially in comparison to other states of the European Union. Meteora exists in a rural, relatively isolated area of the country, but its status as a major tourist draw has brought better access than one might ordinarily think. Infrastructure tends to be better south and east, toward the two primary population centers. The road network leading inland from the coast is good by Greek standards; the trip from Athens is by limited access, multi-lane highway until the last 30-40 miles. A national road, European Route 92, runs as a four-lane highway into Kalambaka, at the foot of the rocks, before veering off as a treacherous two-lane mountain road to the poorly connected west. It is virtually impossible to fly there, as the nearest airports of any size are in the major cities of Athens (in the south) or Thessaloniki (in the north.) The airport in Larissa does not appear to accept commercial flights. The lack of direct international access means that most tourists see Meteora as a part of longer stays in Greece.

⁸ <http://en.wikipedia.org/wiki/Greece> October 15, 2006

The rail network however is exceptional relative to the remainder of the country. Kalambaka, the larger of the two towns at the foot of the rock formations, is the final stop on a rail line that connects to the main Athens-Thessaloniki route. Six trains per day run to Athens, including two that are advertised as direct.⁹ It is possible to reach either destination in 5-6 hours, including the time to change trains. This is abysmal by more developed standards, however in Greece it is remarkable.

The final mode of transportation into Meteora is by bus. The KTEL bus company is actually an amalgamation of regional bus carriers that operate under common ticket and maintenance arrangements, forming a de-facto national bus company. Service on the buses is slow but cheap, and often highly unreliable on the less trafficked routes. Express busses are rare, and most vehicles go out of their way to stop in every tiny habitation along the route. The bus station in Kalambaka advertises 7 daily busses to Athens, and acts as regional depot for many other inland bus lines. The result is a fairly nice rural system of transit, albeit much less dependable than the rail system.

⁹ “Direct” in this instance seems to mean that one must still change trains, but that train times are coordinated in such a way that another train will be waiting for passengers at the appropriate stop, limiting time spent waiting at various stations. This should not be equated with convenience.

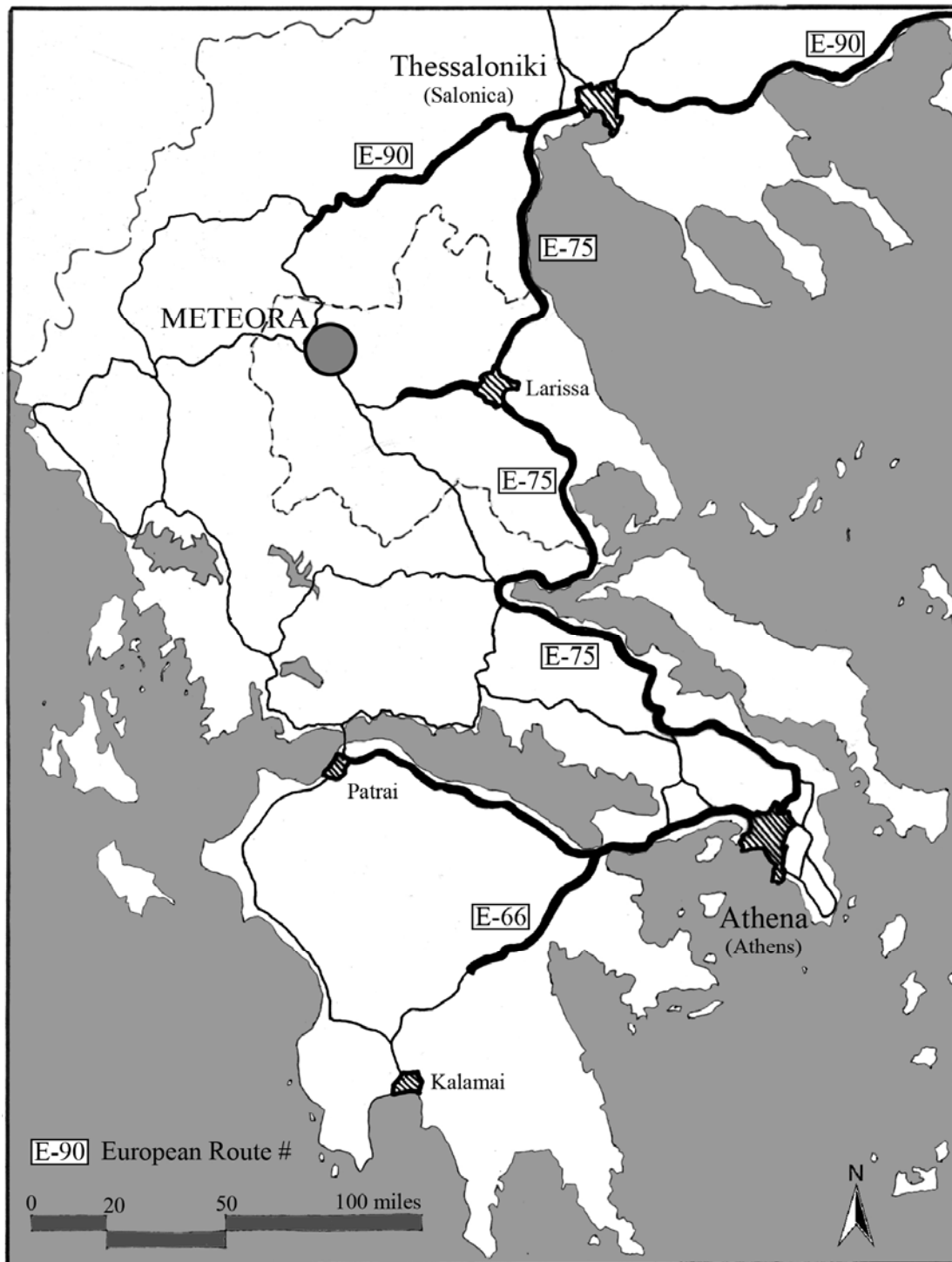


Figure 08: A map of Greece indicating major road networks across the nation. The Athens-Thessaloniki route is the main highway, with most inland transit taking the form of a spur off the eastern coastline. Access to Meteora is facilitated by spurs from Larissa and Thessaloniki, which extend most of the way to the area. [Source: D. Lamp]

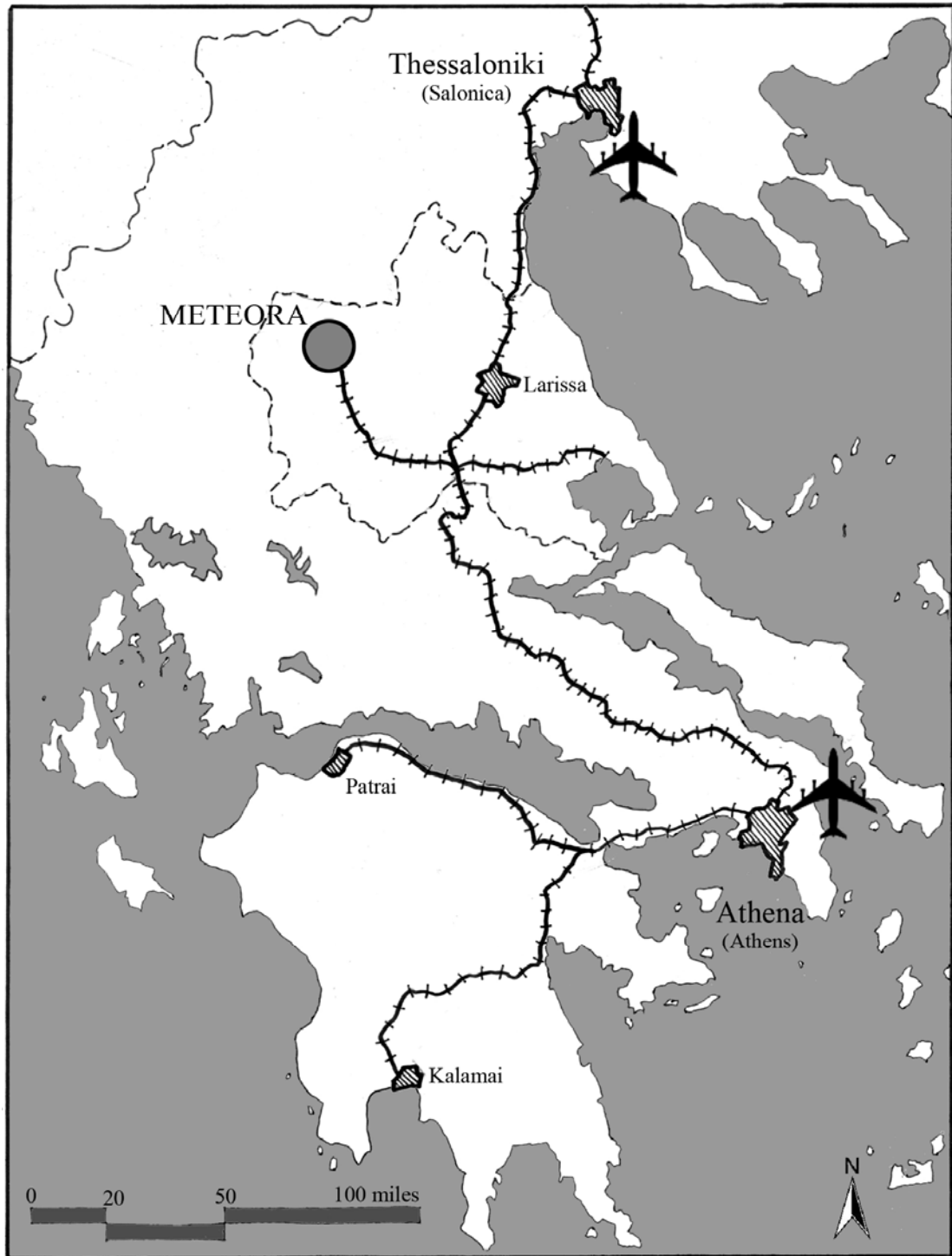


Figure 09: A map of Greece showing major rail lines across the nation. There are not many, and the ones that exist largely mimic the routes of major highways, as shown in Figure 10. Again, the Athens-Thessaloniki line is the major spine, with a single transverse section that runs to Meteora at one end and a seaside resort on the other. Despite the lack of rail coverage, service between major cities and tourist destinations can be good, which connects Meteora well to the capitol. International airports are depicted near the two major population centers. [Source: D. Lamp]

Meteora, Thessaly, and Greece in general have a long and storied history. Relevant to the thesis at hand is the history that begins in 9th century AD, or about the time when the first hermits and ascetics began living amongst the rocks for solitude and protection.¹⁰ At that time the area was controlled the Eastern Roman Empire, later the Byzantine Empire, which had survived the fall of Rome itself in AD 476. Thessaly remained a western province of Constantinople until Crusaders sacked that city in 1204,¹¹ carving up the western lands. Nearly two hundred years of chaotic invasions and liberations followed, including two re-conquests by the Byzantines, an invasion by the Vlach tribe (present day Romanians) and an invasion from Serbia. Because of its access to the sea and fertile plain, the area was coveted by many warring states throughout the period.

The Ottoman Turks that inherited the Byzantine Empire held Greece as a restive, troublesome province for hundreds of years. It was not until 1821 that Greek nationalism rose to the point of open rebellion, and then not until 1829 that the Ottomans granted independence to a small portion of modern Greece.¹² Over the next hundred years, the Greeks fought to enlarge their small state and annex areas of ethnically Greek population. The Ottomans however ceded Thessaly without a fight in 1881.¹³ The Greek and Ottoman border wars were fought along the area in which Meteora lies, culminating in The Balkan Wars of 1913, which nearly doubled the territorial holdings of Greece.

¹⁰ Μητολκώστα, 24

¹¹ http://en.wikipedia.org/w/index.php?title=History_of_Greece&oldid=94841747, December 19, 2006

¹² Ibid.

¹³ Ibid.

During WWI Greece sided with the Triple Entente, against Turkey. Little of consequence happened in that time, as Greece and Turkey had just exhausted themselves in the Balkan Wars. During WWII however, Greece was invaded first by the Italians then, after beating back Hitler's ally, Germany herself. Greece was brutally occupied for years by Germany, during which time many of the monasteries that existed in Meteora were either deliberately destroyed or withered from neglect. Almost no monastery escaped marauding troops or artillery fire. Much of the looting and destruction inflicted upon Meteora occurred as little as sixty years ago.

The two habitations at the foot of the rocks, Kalambaka and Kastraki are small towns transformed by the tourist economy out of certain obscurity. While Kalambaka is by far the larger entity, neither location has a population big enough to register on national charts (meaning over 15,000 residents.) The cities together form an interesting gateway in Meteora; Kalambaka is a required experience, as the only roads into the rocks and on top of the rock faces run directly through town. Kastraki lies off the same ascent roads into Meteora, but presents itself a small hamlet that one must turn off the road to see. Most tourists do not bother with the smaller village, while Kalambaka offers food and accommodation for anyone not merely passing through.

Kalambaka is a good-sized town to serve as a base to explore the nearby rocks and monasteries, which is generally why one would come so far. The national road deposits traffic onto the main street before running a bit of a beltway outside the southern half of town. The main street, Trikkalon, runs nominally east/west and contains most the services, and all the banks and restaurants. There is an old city, located on a plateau above the more recent development that constitutes the majority of town. The old city is small, tight and idiosyncratic, and centered around a pleasant church and small open space in traditional Greek fashion. The newer city is gridded and centered around three main plateias, or open spaces, at the third points along Tikkalon Street. The train station and rail lines loop to the South and are accessed off the national road, at the edge of town.

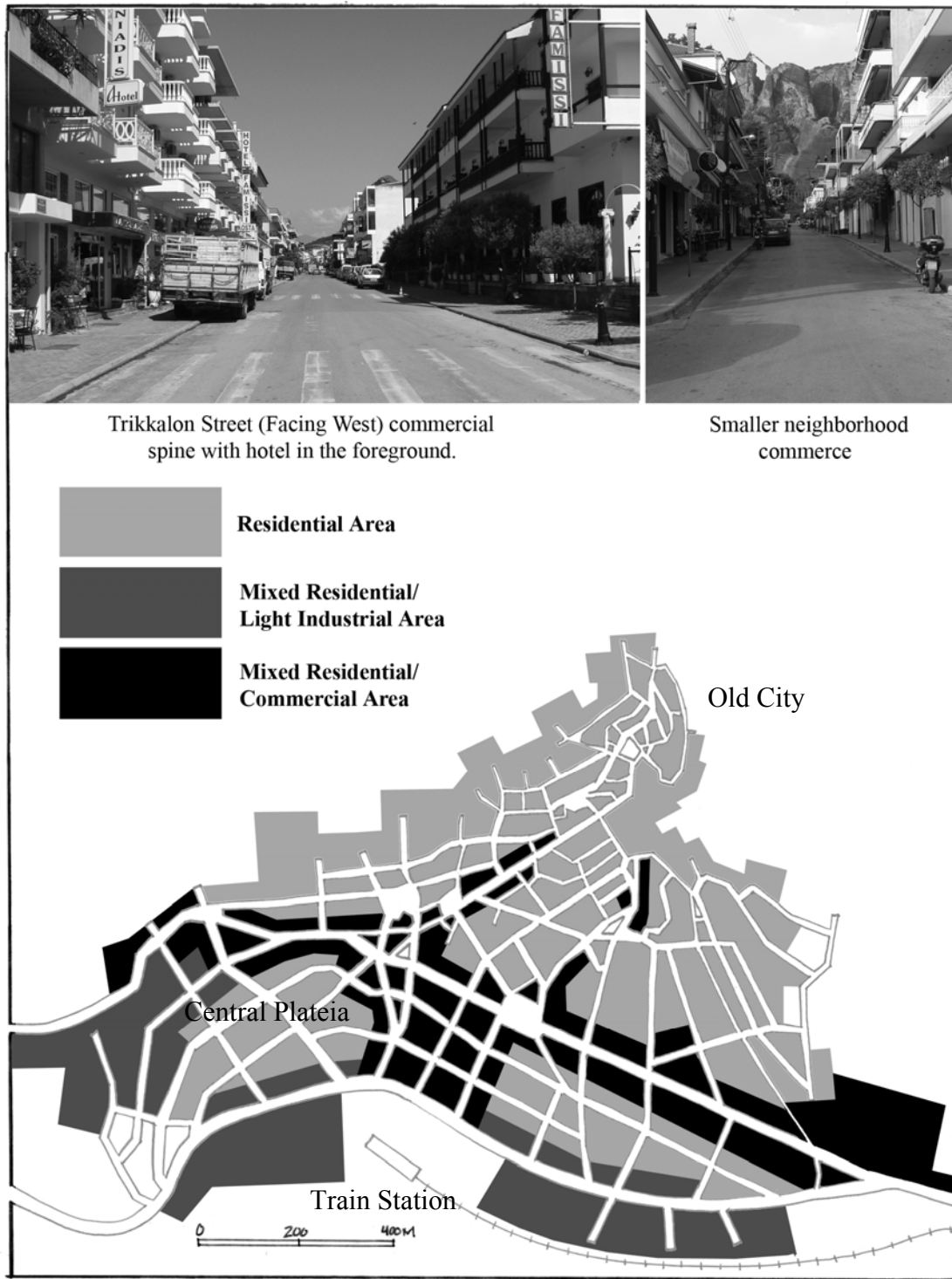


Figure 10: A map of Kalambaka indicating principal road networks and land usage. Trikkalon Street is the wide east/west thoroughway around which most of the city's commerce is arranged. The national road skirts around the city to the south, where the train station is located. The old city lies north of the main commercial district. [Source: D. Lamp]

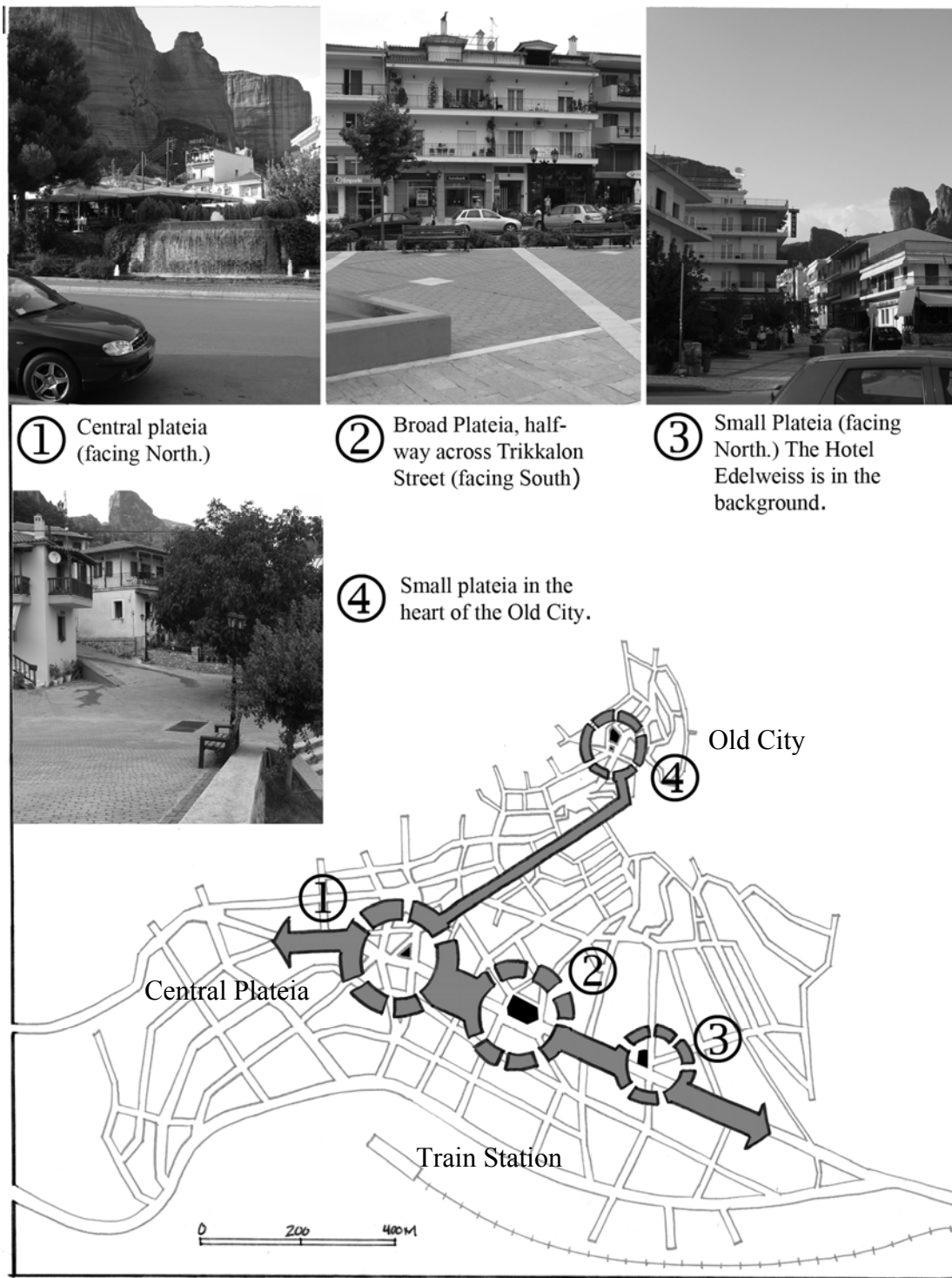


Figure 11: A map of Kalambaka showing the principal open spaces, or “plateia” in Greek. The central plateia (#1) serves as the city center and unites the old and new portions of the city. Three open spaces line up along Trikkalon Street, while a small, informal square in the old city (#4) serves as a center for this neighborhood. The city is laid out in order to maximize the commercial strip, which then leads up to the tourist attraction in Meteora. [Source: D. Lamp]

The tourist infrastructure in Kalambaka is everywhere, and caters to alternate modes of arrival; there are a series of hotels across from the train station, on the main square, near the bus station, as well as the major east entry into town off the main road. The nicer hotels, including the Divani Conference Center, tend to be at the turn-off onto Trikkalon Street from the national road. They form a sort-of “hospitality gateway.” (See later in this chapter for a complete hotel listing and analysis.) Nearly every third shop on Trikkalon is devoted to souvenirs and sells almost the same thing as its neighbor two doors down. “Traditional Greek Eatery” signs abound. There are two little grocery stores near where the bus stops to go into Meteora, in case a backpacker needs to bring a lunch. The tourist information center is located off the main plateia, and is most remarkable in that it exists at all.

Kalambaka caters well to tourists in food, accommodation and souvenirs.

The Kalambaka building stock is similar to what may be found in other urban areas in Greece. Three to five story mixed-use structures line the main thoroughfares and plateias. On the back streets, two to three story single family or story duplexes line the blocks, with an occasional corner store built into a three-story structure. Everything is made of site cast concrete, and approximately 10% of the inhabited structures appear to be under construction, permanently. The structures in the old city tend to be two stories, single-family homes with occasional business on the lower floor. They are tighter, and begin in some instances to be built directly on the rock as it pokes out of the earth.

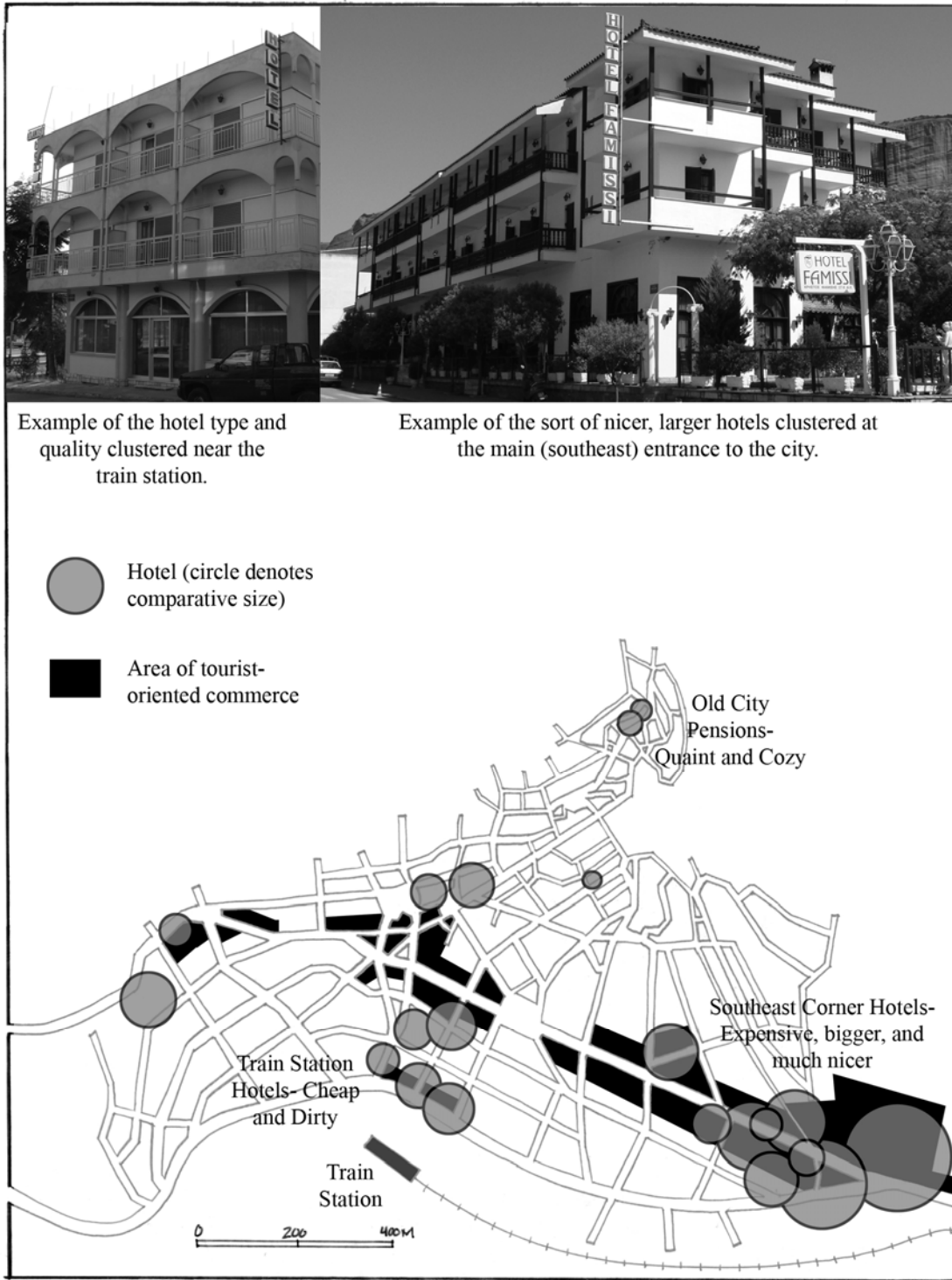
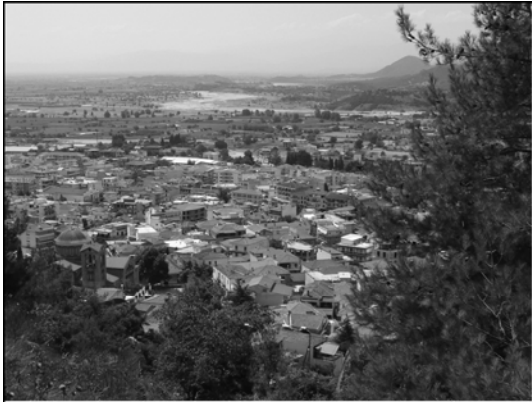


Figure 12: A map of Kalambaka indicating the locations of hotels in the city. Concentrated areas of general tourist commerce occur at the southeast “gateway”, near the train station and around the central square. The range of accommodation is good, however the supply of quality hotel rooms and pensions can be very limited during the high season. More interesting, quality accommodation would be useful. [D. Lamp, 2006]



View of Kalambaka from the hills above



The Divani Hotel and Conference Center, located at the southeast “gateway.”



The Antoniadis Hotel, also at the southeast “gateway.”



The Edelweiss Hotel, located off of one of the plateias on Trikkalon Street



Pension for rent in the Old City.



Example of a tourist souvenir shop located near the main plateia.

Figure 13: An overview of the tourist infrastructure in Kalambaka. The city offers a good variety of quality of accommodation, however nicer hotels like Edelweiss and Divani fill in the high season. Cheaper, clean hotels can be in short supply, especially for the backpacking crowd. [D. Lamp, 2006]



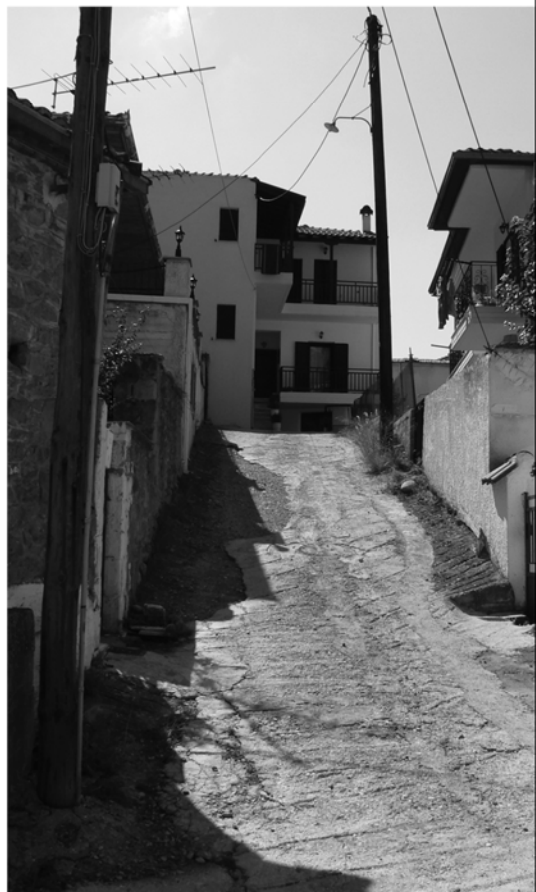
Church in the Old City competes with the rocks beyond



A house in the Old City built directly on a rock outcropping



A street scene in the New City in Kalambaka



A street scene in the Old City in Kalambaka

Figure 14: An overview of the disparity between the Old and New Cities in Kalambaka. The Old City is smaller, more idiosyncratic far less dense than its counterpart below. [D. Lamp, 2006]

Kastraki is a village nestled in one of the steep valleys between rock pillars. It is constructed in a loose series of terraces, with the town square and church on the lowest tier, where the city meets the through roadway. The residential portions then generally step upward and ascend to the East, looking down on the church as they rise. The very top portions would be very difficult to reach by car, especially in the winter months when ice builds on everything. The only approach into town is a turn-off along the winding road from Kalambaka up into Meteora. At the turn a cottage tourist industry has sprung up, selling backpackers and motorists last minute snacks, batteries, maps, tour guides, etc. Several tavernas, or family run Greek restaurants, are busy around lunch with passing traffic, but generally business is slow. This area constitutes the vast majority of commerce in the village.

The housing stock in Kastraki is interesting, and stands apart from the more conventional applications found next door in Kalambaka. There appears to be a sort-of Swiss chalet style to some of the homes, featuring pitched roofs with exposed timber lookouts and dormers, stone foundations, and dual chimneys. The style is definitely not native to the area and probably not to Greece either; it appears as though some homes were constructed with a snowy winter theme in mind, as though Kastraki could function as a ski resort in the right season. This is not true; Greece does in fact have ski resorts, however the terrain here is far too steep and irregular for such a use. Whatever the reason, the stone and timber houses are an unusual but not unwelcome site in central Greece.



Example of the housing stock located in the upper terraces of Kastraki



Example of a typical Kastraki home. The use of stone, albeit decorative, is unusual in Greece.



Another example of the stone and timber style that appears in the upper terraces.



A pleasant, if deserted, taverna on a side street leading down to the village square.



A Street sign in the small commercial section of Kastraki. The sign is indicative of the level of sophistication of these shops.



Another example of tourist-oriented commerce on the outskirts of Kastraki.

Figure 15: An overview of the town of Kastraki. The village retains much of its sleepy charm despite its close proximity to Kalambaka and its tourism enterprise. [D. Lamp, 2006]

The countryside that immediately surrounds Kalambaka is mainly pastoral land for goats and horses. This is due in part to the undulating terrain that evens out more as one heads further into the Plain of Thessaly. Once on truly flat ground, there are lines and lines of soy fields as far as the horizon. The north and west, away from the plain, begin to be mountainous. The Meteora rocks effectively serve as a buffer between the plain and the foothills of northern Greece. Pineus River flows out from the northern highlands, down around the southern end of Kalambaka, and into the Plain of Thessaly. The river then winds its way to the sea, cutting the plain roughly in half as it travels. The river is shallow, muddy, and un-navigable. At the height of summer, it appeared to be nearly dry. (Though the same can be said of many of the valley streams between the rocks, and in the winter rainy season they rage with water.)

A person's experience in Meteora depends largely on the means of travel that brought them there. This is due to the fact that different modes of transit connote different lengths of stay, activities, etc. The vast majority of tourists fall into one of the following categories:

Client	Duration of Stay	Room	Travel Method
Convention Goer	2-3 Days	Hotel A/B Class	Private Car
Package Tour	1-2 Days	None or Hotel A/B/Class	Tour Bus
Car Tour	1-2 Days	None or Hotel B/C Class	Private Car Hike
RV	2-3 Days	RV	RV Hike
Backpacker	2-4 Days	Hotel C/D Class	Train Public Bus
Mountain Climber	3-6 Days	Hotel A/B/C Class	Train Public Bus

Convention Goer- An individual in Kalambaka for an event at the Divani hotel and Conference Center. This person likely came with friends, and will likely go to see one or two monasteries in his or her time away from the conference. They are likely to have driven to Kalambaka, and thus are likely to drive to see the monasteries.

Package Tourist- An individual who has purchased an inclusive ticket with a tour company. This person likely came with friends on board a tour bus. This tour will likely stop at two monasteries, a scenic lookout area, and a pre-selected taverna in Kalambaka. The majority of package tours spend one night at an A or B class hotel.

Car Tour- A foreign or domestic tourist who is most likely not staying long and plans to travel elsewhere in Central Greece before or after Meteora. This individual probably came with friends and/or family, and may not spend the night at all.

RV- Friends and/or families that have brought their own room with them. Several campgrounds allow cheap camping and RV parking. These tourists are likely hikers and outdoor enthusiasts of some kind, and may use the cities only for food procurement and nightlife.

Backpacker- A small group or an individual that most likely arrived by train from elsewhere in Greece. These parties tend to be younger, hiking oriented, and content with cheaper, lower quality accommodations by the train station.

Mountain Climber- A small group that arrived by any number of modes of transit with intent to stay for longer than the average tourist. This is the most difficult group to generalize about due the disparity of income; some are quite wealthy, some most closely resemble backpackers in their accommodation and modes of travel.

Figure 16: Chart of different types of tourist that come to Meteora. The duration of stay, combined with the degree of "outdoorsiness" of each group begin to define specific user sets.

Meteora functions a generator of a tourism industry, and Kalambaka (and to a lesser degree Kastraki) become facilitators of it. Catering to the disparate user groups is difficult, and even as Kalambaka boasts a wide array of accommodations the supply and character of those hotels can be questionable.

Hotel Name	Location		# of Rooms	Cost Per Night	Tourist Rating	
	City	Situation			Class	Star
Amailia	Countryside	Out of Town	173	€100	A	4
Divani	Kalambaka	Periphery	165	€85	A	4
Xenia	Countryside	Out of Town	???	???	A	3
Antoniades	Kalambaka	Periphery	104	€45	B	3
Edelweiss	Kalambaka	Central	57	€55	B	3
Famissi	Kalambaka	Periphery	46	€40	B	3
Kaikis	Kalambaka	Periphery	18	€25	B	3
Kastraki II	Kalambaka	Central	25	€30	B	2
Odyssion	Kalambaka	Periphery	22	€45	B	3
Orfeas	Kalambaka	Train Station	104	€40	B	3
Sakellaridis	Countryside	Out of Town	49	???	B	3
Xenos	Kalambaka	Central	61	€50	B	3
Aeolikos Star	Kalambaka	Central	18	€40	C	2
Atlantis	Kalambaka	Train Station	28	€25	C	2
France	Kalambaka	Train Station	30	€40	C	3
Galaxias	Kalambaka	Bus Station	24	€30	C	2
Helvetia	Kalambaka	Bus Station	18	€25	C	2
Kefos	Kalambaka	Periphery	11	???	C	2
Olympia	Kalambaka	Train Station	22	€35	C	2
Rex	Kalambaka	Periphery	39	€35	C	2
Sidney	Kalambaka	Periphery	???	???	C	1
Koka Roka	Kalambaka	Old City	???	???	D	-
Rooms Irene	Kalambaka	Old City	12	€20	D	-

Figure 17: Chart showing the accommodation options in and around Kalambaka. The list constitutes the majority of room options available in the area, though smaller pensions, campgrounds, and hotels exist in Kastraki. At the time of publication 1€ = \$1.32 (US)

The hotel and tourist infrastructure in Kalambaka is very sound with the exception of one demographic, that being the backpacker and/or climber variety of tourist. Most hotels are geared toward either package tourists or family vacationers, which are more plentiful and comparatively rich. It is understandable then that few hotels would want to cater to this group of users, and as the hotel listing above indicates that only two very small pensions in the Old City are marketed toward them.

Prior to the tourist onslaught that Meteora sees every year, the Monasteries themselves would offer Spartan room and board to any traveler that had made the arduous trip into the valley. Early travelers' accounts of the hospitality of the monks and the intimate settings within the monasteries stand in sharp contrast to the tourist bustle and impersonality of the experience today. It is impossible to recreate the setting of Meteora as a distant wilderness curiosity with the volume of tourists that come now. In the development of a new monastery however, it is possible to **recreate the hostelling function** less as a refuge for weary travelers and more as a unique overnight experience for those who are willing to plan ahead and adopt the monastic lifestyle for a night or two. A hostel in an intimate setting, (to literally live like a monk for a night,) is an interesting and worthwhile program enhancement, and one which more modern, capable monasteries perform.

The Byzantine monasteries are the major tourist draw, and have been for centuries. There exist today seven functioning monasteries, and four intact ruins that could, with manpower and funding, be refurbished. Earthquakes, war, and substantial neglect have destroyed the remainder of a once total twenty-four monasteries.¹⁴ The buildings themselves are rather unexceptional, being made of local stone and short span wood members, with tile roofs. Guidebooks report on the condition of frescos in the chapels and churches within the monasteries, however these are relatively unimpressive as well. What is spectacular is their setting, indicating that the phenomenon of building/extreme terrain that this thesis seeks to study is at least a powerful, dramatic aesthetic.

In 1849, the French Archaeologist L. Heuzey wrote an article for the publication Revue Archéologique which served not only to publicize Meteora to a western European audience but also as a survey of the monasteries that were either present at that time or of which there was written evidence.¹⁵ This account is summarized as Figure 21 on the following page, using Heuzey's original catalogue numbers for identification. Present day status and construction/destruction dating information is given, as it is known.

¹⁴ Nicol, 44 supports L. Huezy's 1849 survey with record of at least twenty monasteries.

¹⁵ Skouvas, 16

No*	Name (Current English Version)	Names (Historical)	Date(s) Constructed	Status
1	N/A	Agion Pneuma's	Unknown	Lost
2	N/A	Agios Modestos	Unknown	Ruin
3	N/A	Alyssos	Unknown	Ruin
4	N/A	Olgas	Unknown	Lost
5	Saint George's	Agios Georgio's	Monastery 1300	Intact ruin
6	N/A	Agios Taxiarchae's	Unknown	Lost
7	N/A	Agios Dimitrios	Monastery 1367 Razed 1308	Ruin
8	Saint Anthony of the Lower Valley	Agios Antonios'	Monastery late 1300's Rebuilt 1980's	Rebuilt new closed to public
9	N/A	Agios Athanasious'	Unknown	Lost
10	N/A	Pangia's	Unknown	Lost
11	Badovas	Agios Nicolaos Batova's	???	Intact closed to public
12	N/A	Agios Nicolaos Cofina's	Unknown	Lost
13	Great Meteoron or Monastery of Transfiguration	Meteoron or Metamorphosis	Church 1383 Monastery 1557?	Functioning and open to the public w/ museum
14	Varlaam	Varlaam	Church 1350 Monastery 1517	Functioning and open
15	Saint Steven's	Agios Stefanos	Founded 1192 Monastery 1300	Functioning and open
16	Monastery of The Holy Trinity	Agia Trias or Holy Trinity	Church 1476 Monastery 1689	Functioning and open
17	N/A	Agia Mone	Monastery 1614 Destroyed 1858	Ruin
18	Roussanou	Roussanou or Agia Barbara	Church ??? Monastery 1545	Functioning and open
19	Hipapanti	Ypapanté's or Ipapanti	Monastery 1366?	Intact ruin closed to public
20	Pantocrator	Pantocratoros	Monastery 1426	Ruin
21	N/A	Callistratou	Unknown	Lost
22	Monastery of the Calligraphers	Ypsiloteria's	Unknown	Lost
23	N/A	Moné Doupianis	Unknown	Lost
24	Saint Nicholas's	Agios Nicolaos Anapausas'	Rebuilt 1527	Functioning and open

Figure 18: L. Heuzey's 1849 monastic survey. Modern English naming conventions, construction and destruction information, and current status have been added.

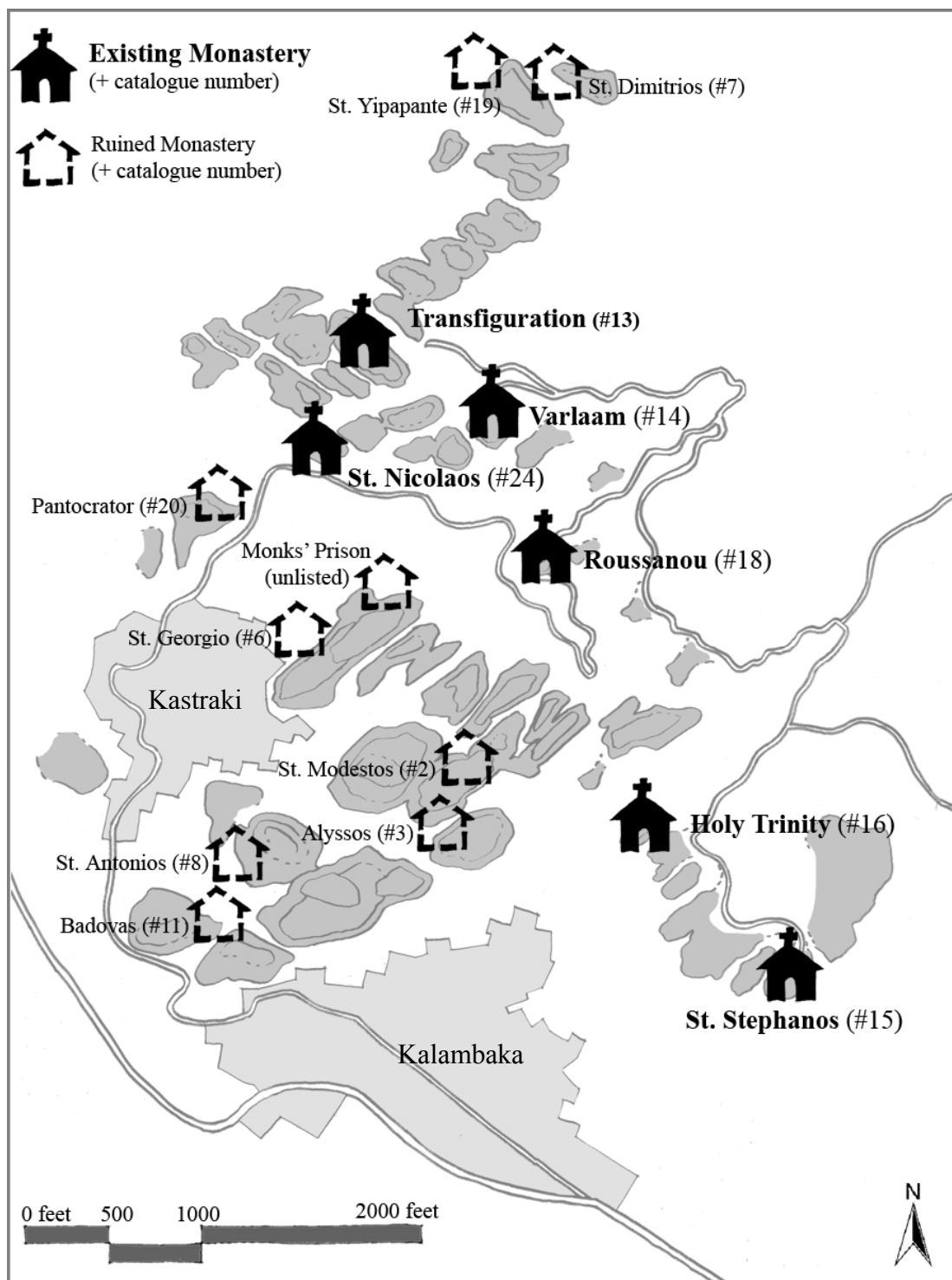


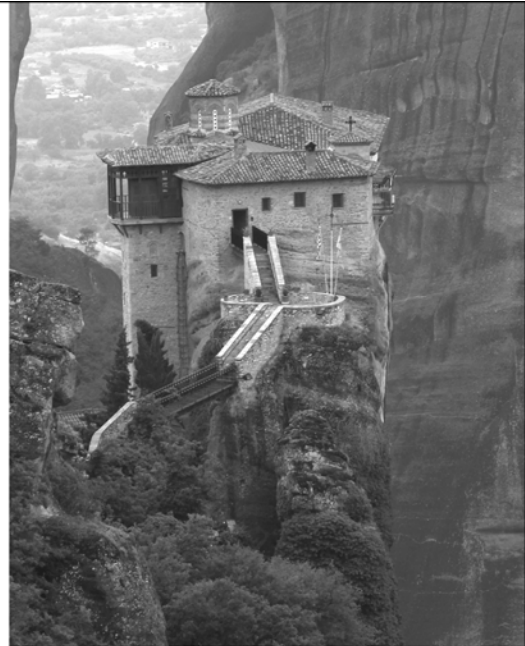
Figure 19: A map of Meteora indicating the locations intact and ruined monasteries. The number that follows the name corresponds to the catalogue in Figure 21.

The Byzantine Monasteries that still exist in Meteora are precedent for building/extreme topography interface. While the current study is proposed as a means of testing a thesis, the current cliff top structures can be seen pushing the construction technologies of their time to the limit in order to achieve the very palpable goal of security and defense. Yet there is more to their interaction with the rocks upon which they sit, in that this typology specifically was drawn to this sort of terrain for aesthetic and especially spiritual reasons. Removal from fellow man by choosing an inaccessible site that is also physically closer to the sky and God serves dual spiritual and defensive functions. The monasteries here are not only of the rock in terms of massing and materiality but also in spirit as well. “Stretched upward as they [the monasteries] are, and at the same time rooted in the earth, they suggest the idea of struggle between attraction to the earth and extension skywards.”¹⁶ **The combination of landscape and building creates a unique composition** that is the draw of Meteora. Any new addition to that composition, in the form of the new monastery proposed herein, must respect that aesthetic. The following pages are examples of some of the monasteries that remain and their specific contribution to the composition of Meteora; understanding this balance and specific site features is key to providing a structure that enhances, rather than detracts from the region.

¹⁶ Skouvaras, 13, quote the author.



The ruins of Nea Mone (#17) which was destroyed in 1858 by fire.



The spectacularly situated Roussanou Monastery (#18) is the purest definition of a pinnacle site in Meteora.

Varlaam Monastery (#14) is the second largest in Meteora, and rationalizes the entire top face of its rock.



Figure 20: An overview of Meteora monasteries that are sited upon a **pinnacle** of rock, meaning that there is a steep drop off on all sides of the monastery. This type of site situation is arguably the most dramatic, however leads often to spatial constraints. [D. Lamp, 2006]



Great Megaron Monastery (or Monastery of the Transfiguration, #13) is the largest monastery in Meteora. The sprawling compound is built at the precipice of a cliff and climbs backward across the top of the rock.

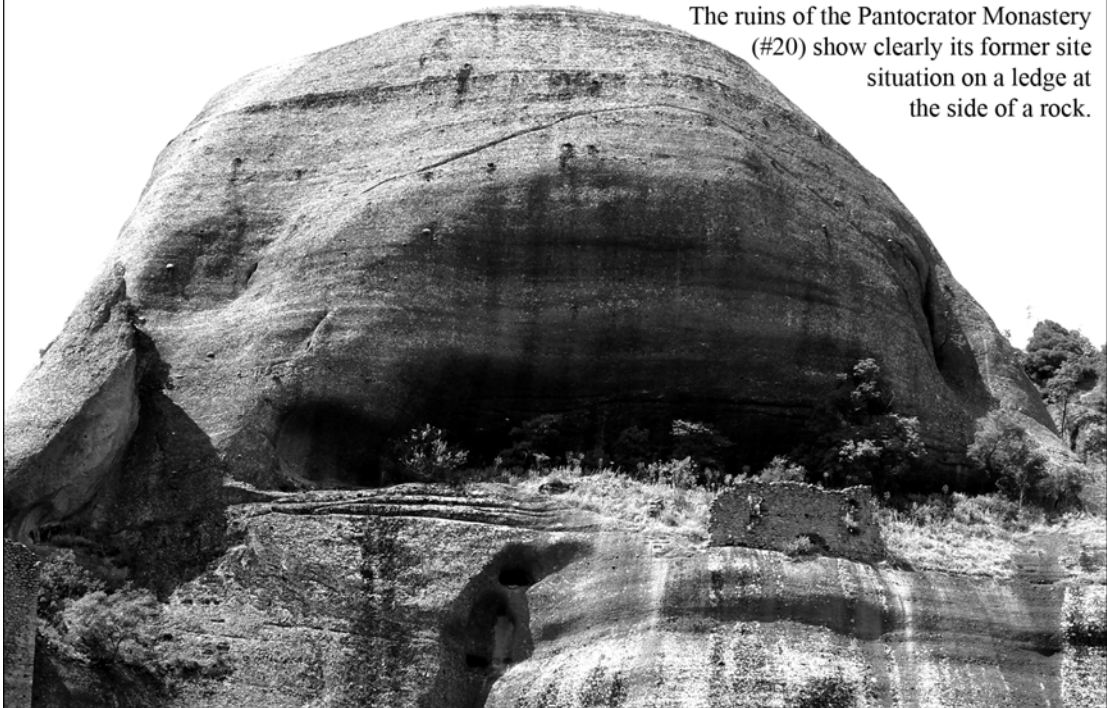
Agias Triada Monastery (or Holy Trinity, #16) has an unusual situation of having too much land at the top of its rock, such that it occupies only about 1/3 of it. Like Great Megaron, it is built at the cliff edge for the purpose of hauling up supplies by lift.



Figure 21: An overview of Meteora Monasteries that are sited upon a **precipice**, meaning that the terrain falls away on only one or two sides of the monastery, leaving relatively flat land at the top of the rock in the other directions. The abundance of land allows for sprawling massing and much larger sizes of building compared to other types of site. [D. Lamp, 2006]

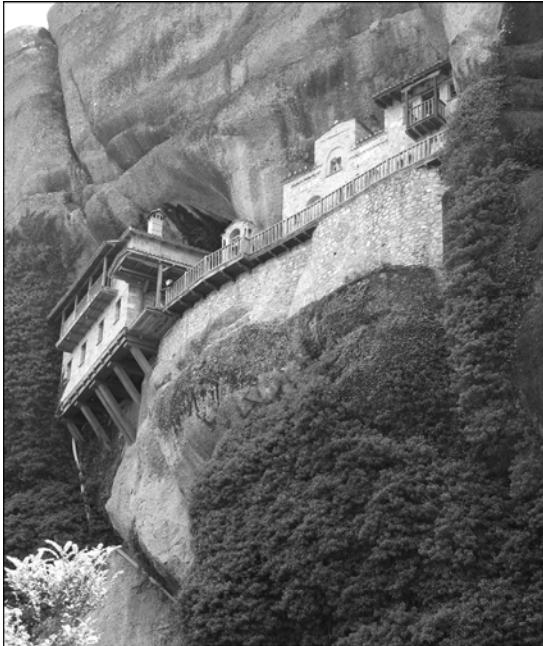


The Monastery of Agios Nicolaos Anapausas (#24) is the purest example of a ledge construction in Meteora, in that it is not situated at the summit of the rock but on the side.

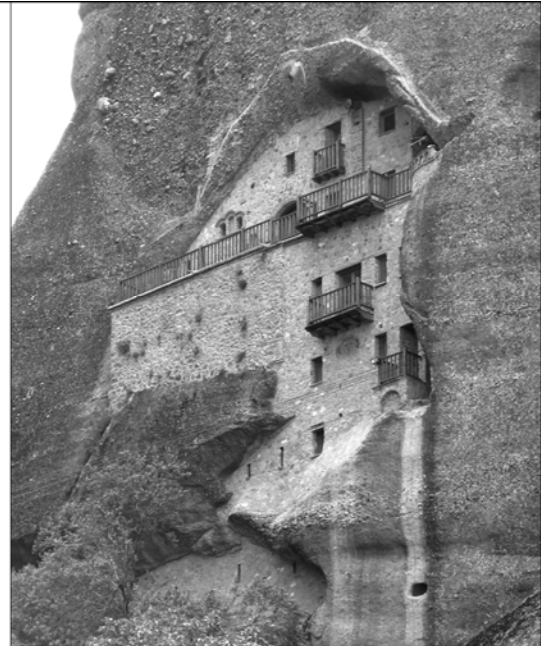


The ruins of the Pantocrator Monastery (#20) show clearly its former site situation on a ledge at the side of a rock.

Figure 22: An overview of Meteora Monasteries that are sited upon a **ledge** in a cliff face, meaning they are not on top of the rock, and that cliff extends above and below the location of the monastery. This site situation allows a good combination of a rational building program and interesting site interface; Agios Nicolaos, above, is arguably the most interesting composition of building and rock, though not as dramatic as some others. [D. Lamp, 2006]



Ypipante Monastery (#19) sits perched at the entrance to its cave.



Badovas Monastery (#11) is built flush to the opening of its cave, making a dramatic composition where the building and rock are difficult to distinguish.

Unnamed ascetic hermitages dot caves throughout the area.



Figure 23: An overview of Meteora Monasteries sited in natural **caves**. This site situation is surprisingly common in the region and the most problematic in terms of access and spatial planning. Cave monasteries tend to be very small but often feature interesting interiors and strategies for distribution of light. [D. Lamp, 2006]

Chapter 3: Site Specifics (Phase III)

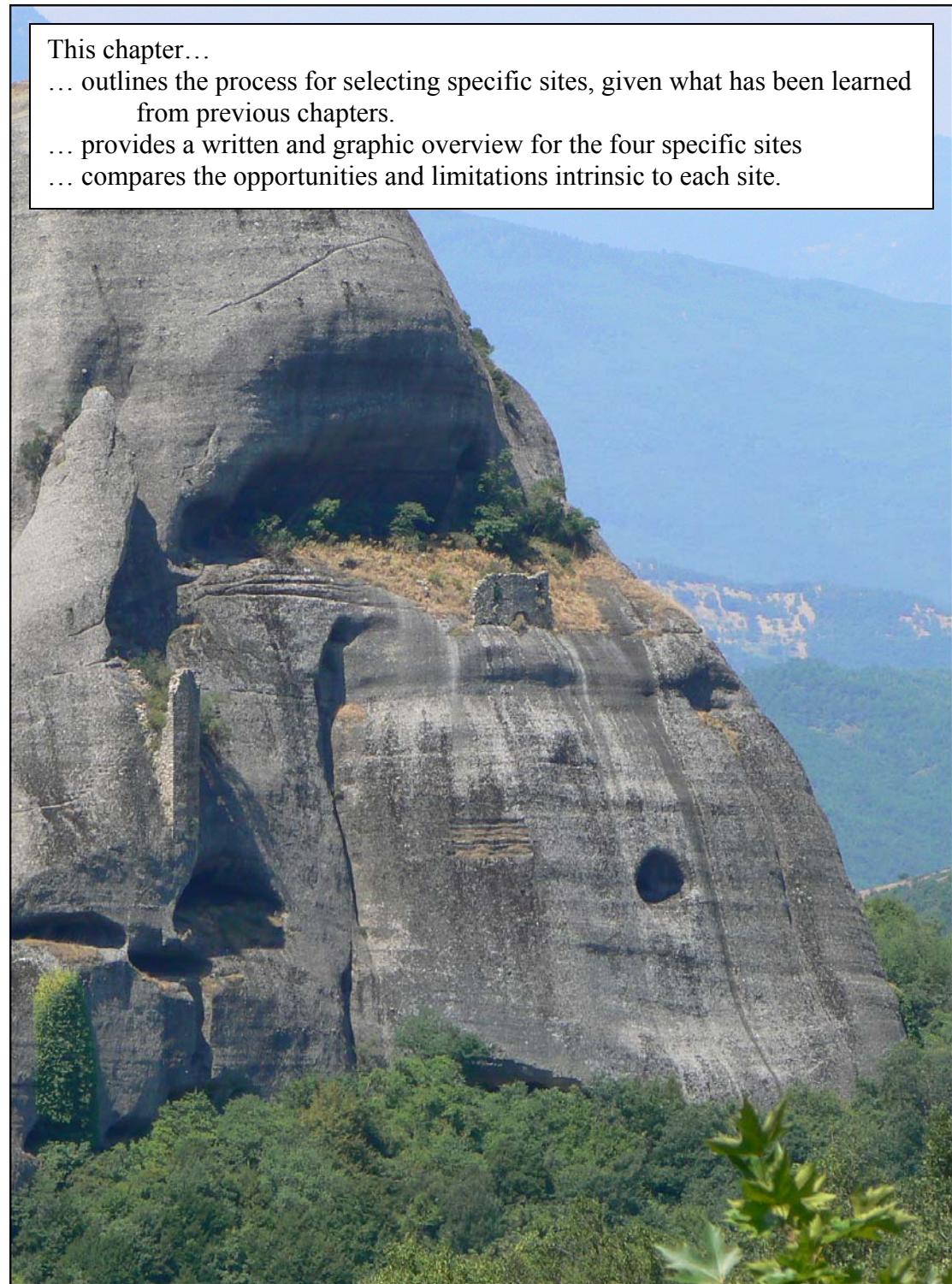


Figure 24: The ruins of the Pantocrator Monastery, which could serve as the site for a new monastery as well. [D. Lamp, 2006]

Within the larger area of Meteora, several specific sites need to be identified in order to test the hypothesis that extreme terrain is a governor of design and form. Chapter one suggests that a new monastery would be the most appropriate program with which to experiment, due to the existing precedent and local need. Chapter two brings to light that the hotel establishment caters little to the rugged backpackers that seek out the region, and that the restoration of the old monastic hostelling tradition would be appropriate for that demographic. Also revealed in chapter two is the idea that the composition of dramatic building and dramatic landscape in concert is more important than either element alone, and that new construction must seek the same sort of harmonious, yet audacious result. These governances are now applied to the selection of specific sites upon which to design.

Site selection then becomes a task of finding first a dramatic setting in which to build, then checking it against known program and character constraints outlined above. There is an element of randomness and personal taste involved of course, since theoretically any un-built rock in the area is a potential site. The selection list is as follows:

Site Selection Criteria:

1. Is the site sufficiently dramatic and/or unusual as to be able to generate the sort of aesthetic response demanded by the existing composition?
2. Is the site large enough? That is to say, without placing numbers to the issue, does it appear as though an existing monastery can fit there?
3. Is the accessibility feasible? The means of ascent and entry need not be easy or straightforward, merely plausible.
4. Is the site sufficiently different in its terrain condition from the other selections?

Figure 25: List of site selection criteria.

The sites chosen are representative of the four classifications of sites that were outlined in chapter two. The final item in the site selection criteria deals with maintenance of a variety of sites involved in the study. The purpose of developing multiple sites simultaneously is to be able to compare similar issues across different terrain types. A recap of the site categories is below:

Classification of Sites According to Terrain	
Designation	Description
Pinnacle	The site exists at the top of a mountain or a spire. This condition is typified by the presence of very little horizontal surface at the top of the rock on which to build, and terrain that slopes away rapidly on all sides. Monasteries built in such locations tend to be vertically oriented, in response to the small footprint on which they site.
Precipice	The site exists at the edge of a cliff. This is different from pinnacle condition in that there tends to be ample land on which to build at the top of the cliff, like a plateau. Monasteries built in such locations tend to be located close to the edge of the cliff for the purposes of loading with a lift or elevator. The relatively large amounts of land lends to more sprawling, spacious massing arrangements.
Ledge	The site exists on a small horizontal outcropping in the face of a cliff, rather than on top of a rock or plateau. Such sites must contend with two extreme vertical conditions, one outboard and lower, the other behind the mass and extending upwards to the top of the rock. Monasteries built in such places tend to feature interesting compositions while retaining more rational building masses. In this regard, these sites can be understood as a good compromise between dramatic, unique setting and the need for rational building placement.
Cave	The site exists in a natural crevasse or separation in the face of a rock. These sites are surprisingly common throughout Meteora, and some of the most successful monasteries therein utilize this type of terrain feature. That being said, buildings erected in caves tend by very small, and logistical issues such as access to light and fresh air are very difficult to solve. These sites are arguably the most difficult to make work of the four types examined here.

Figure 26: Listing of site categorizations of the monasteries that exist in Meteora. The study seeks to demonstrate the role of terrain in design using several different site types, or one from each category.

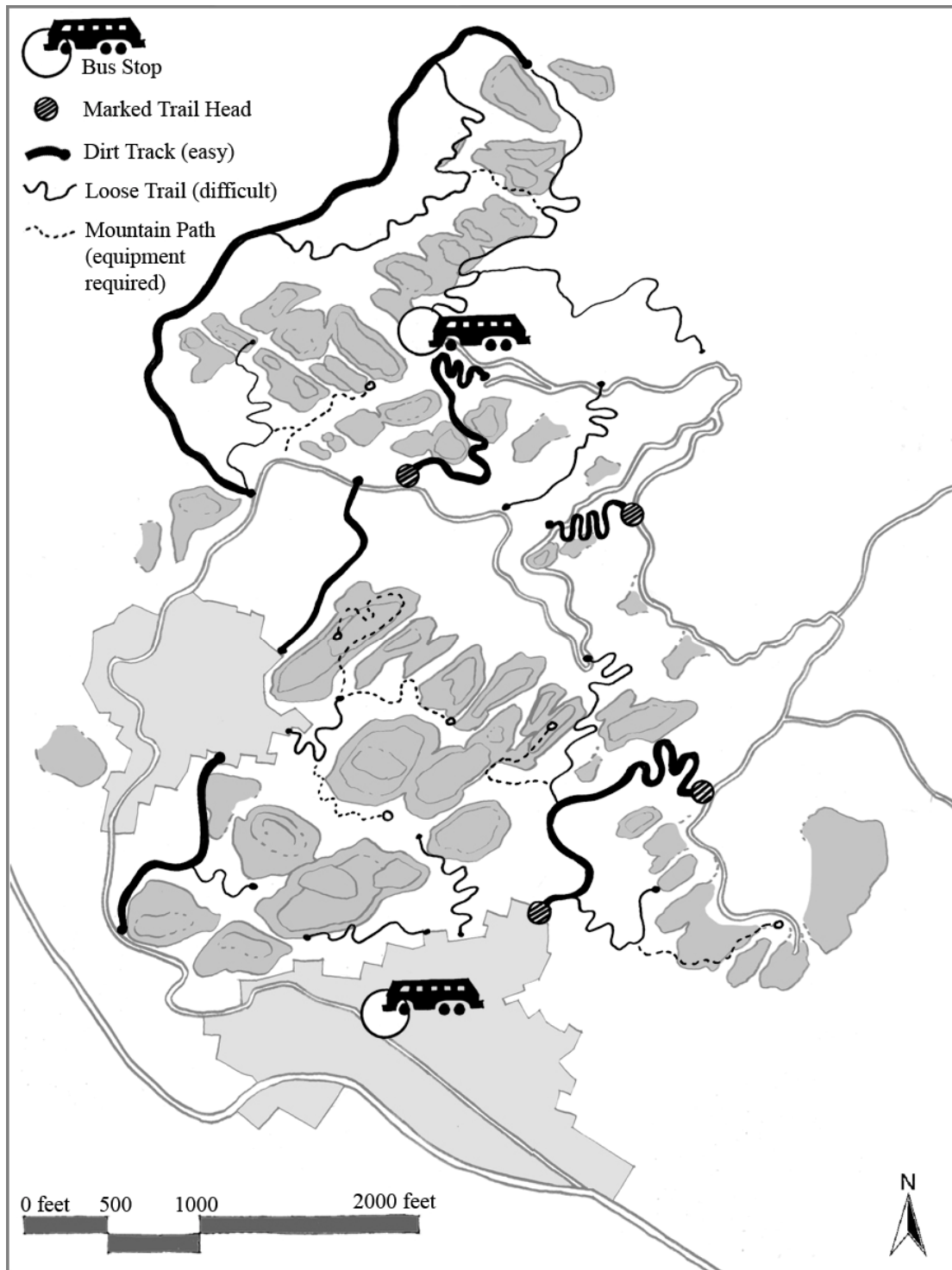


Figure 27: Map of Meteora showing footpaths and hiking trails, in addition to the vehicular roads that rise from Kastraki into the rock formations. Potential access is an important issue in selection, and since the target hostelling demographic is the hiking/climbing crowd, it makes sense to provide access that is reasonable on foot. Loading/supply access is not yet considered a factor. [Source: D. Lamp]

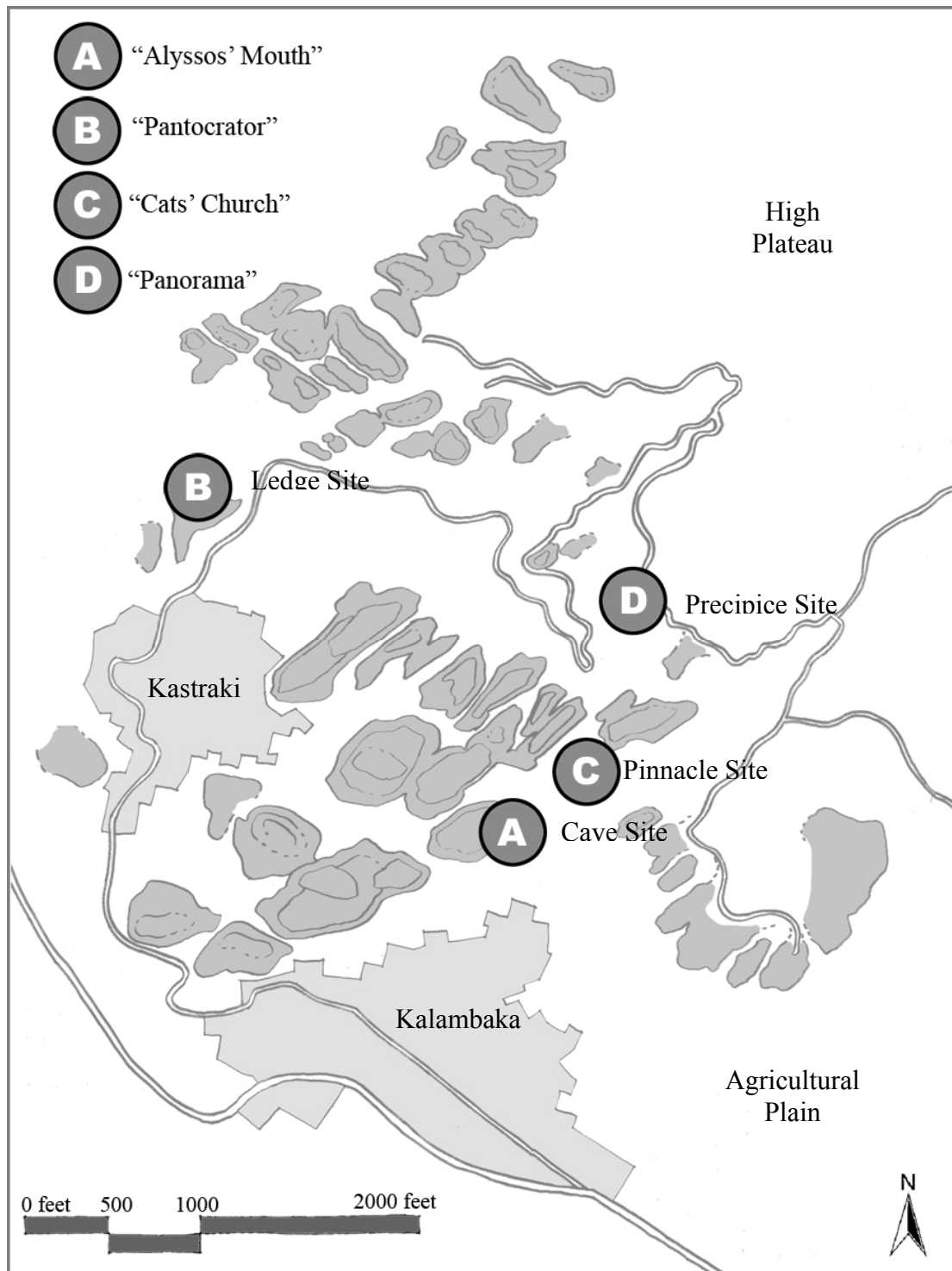


Figure 28: Map of Meteora depicting the location of the four sites. Sites A and C occupy the same gorge but have little relation to each other. The gorge in which they sit is easily accessed by foot from Kalambaka. Sites B and D have high visibility from the main road through the north valley. Site D has almost direct road access from the road nearby. [Source: D. Lamp]

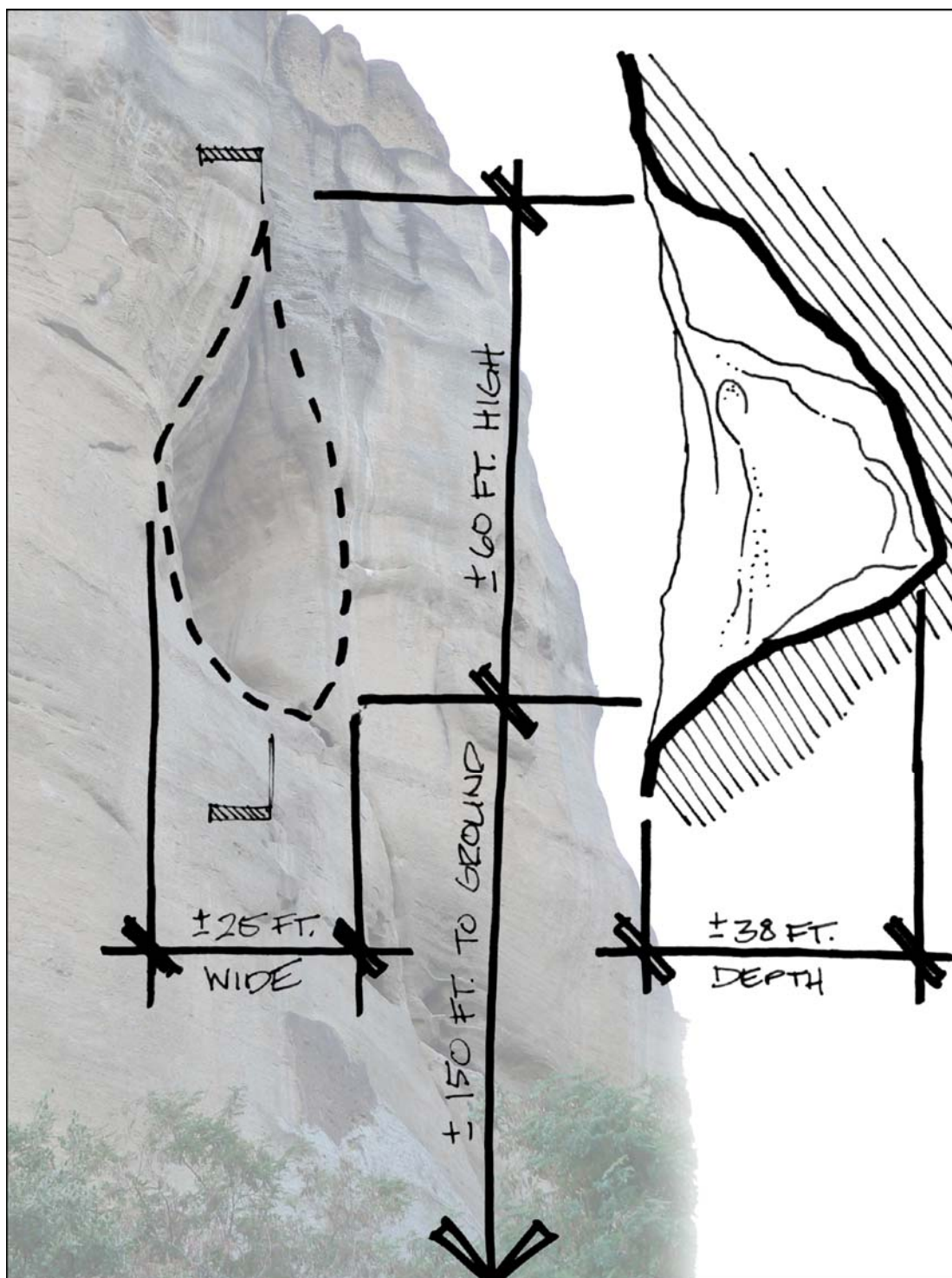


Figure 29: **SITE A: Alyssos' Mouth**

The site is the interior of a hard, stable cave in the side of a nearly sheer cliff face. The bottom of the cave interior sits approximately 150 feet above the valley floor, and substantially further down to the level of Old City in Kalambaka, which is visible from the area. [D. Lamp, 2006]

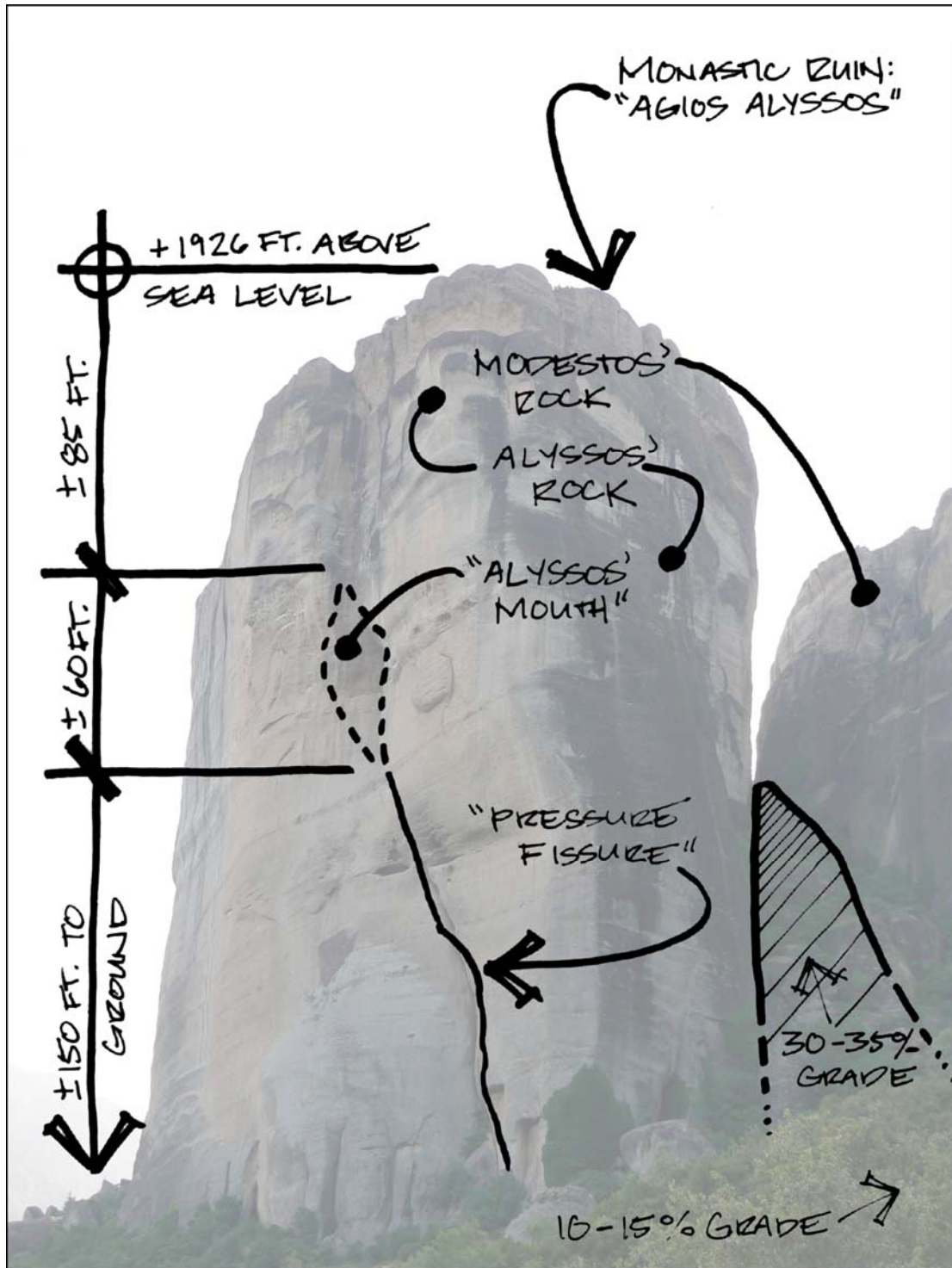


Figure 30: **SITE A: Alyssos' Mouth**

The site occupies a widened pressure in an otherwise simplistic, if large upstanding rock mass. The area depicted on the right in the above figure has a steep but steady incline, which may prove useful for access and massing strategies.

[D. Lamp, 2006]

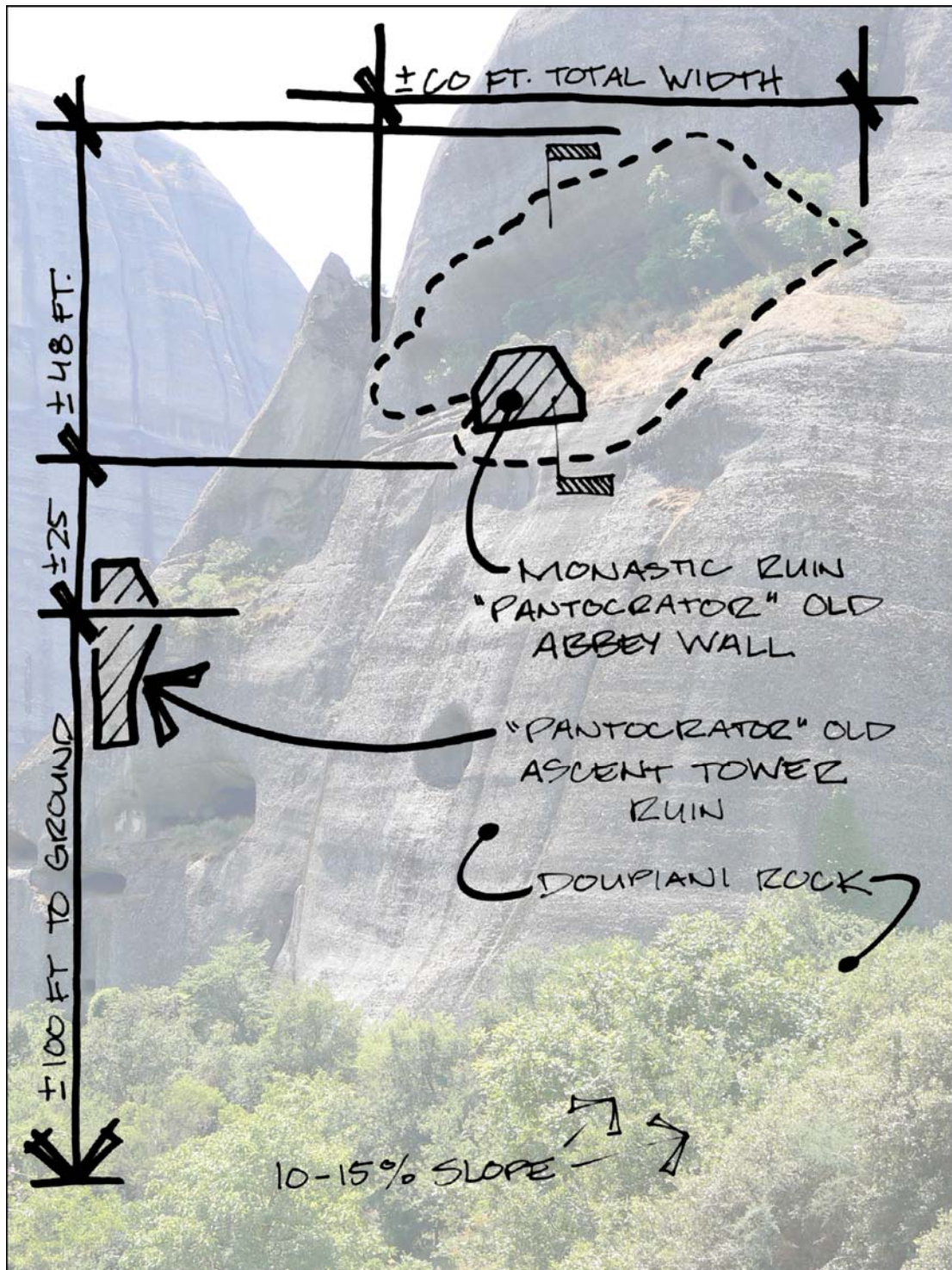


Figure 31: **SITE B: Pantocrator**

This is the former site of another monastery with the same name, some of the ruins of which are visible on the site. The area of interest is essentially a sloped ledge with a slight overhang above the back wall.

[D. Lamp, 2006]

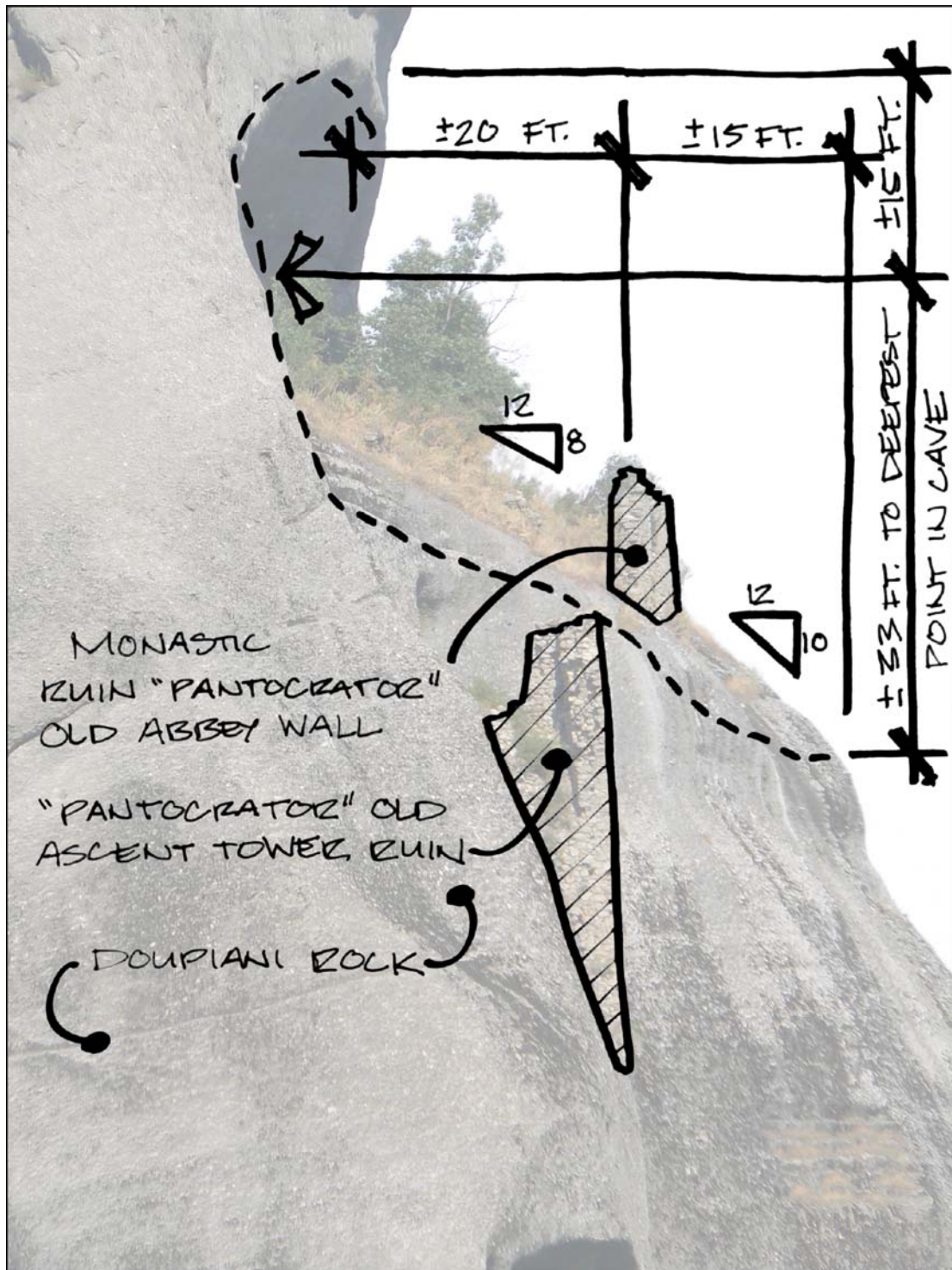


Figure 32: **SITE B: Pantocrator**

The figure depicts as close to an orthogonal section as is possible, indicating the slope of the ground plane. The massing strategy of the former monastery is hinted at here, and is a valuable informant as to current massing strategies. [D. Lamp, 2006]

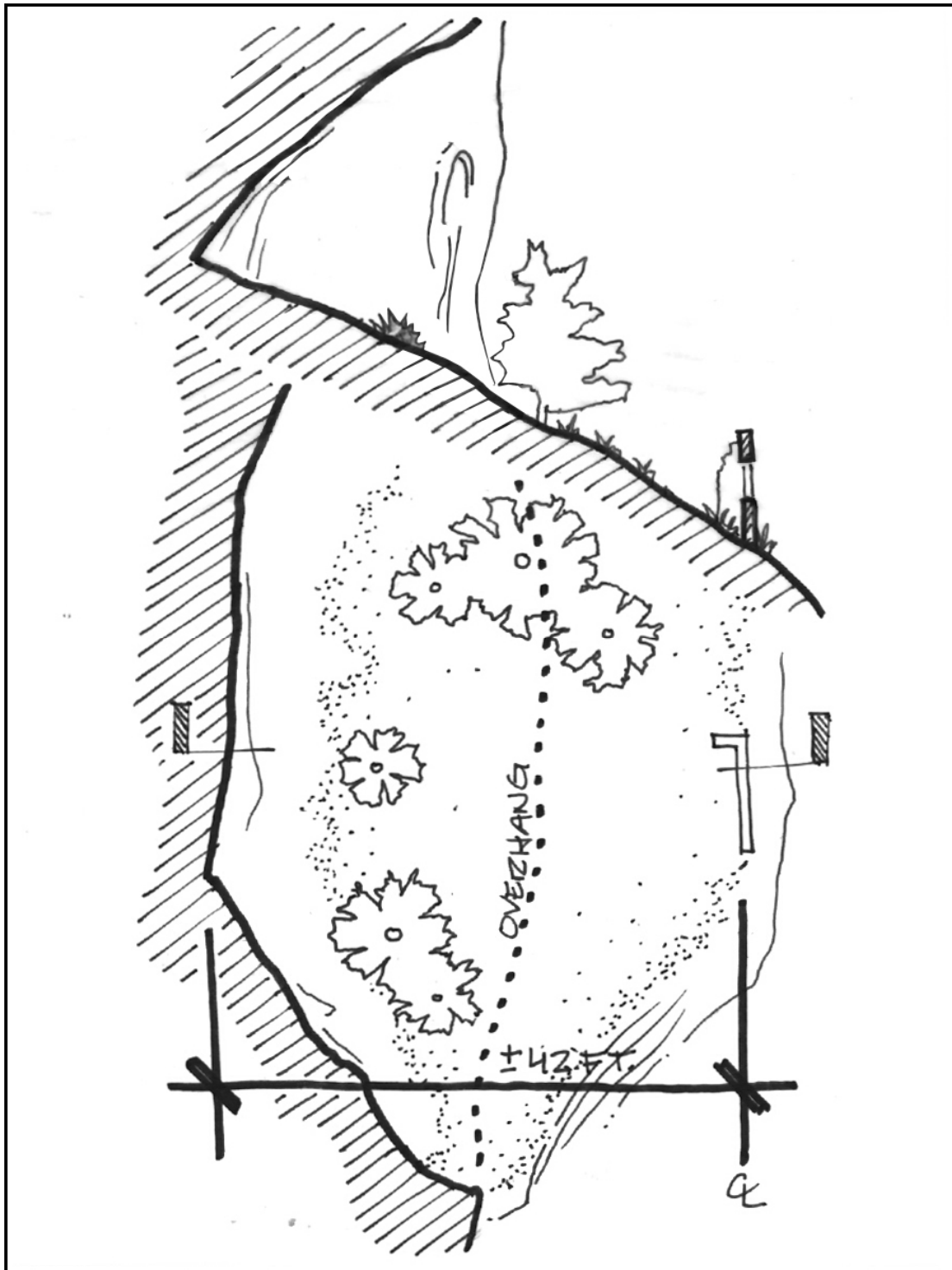


Figure 33: **SITE B: Pantocrator**

The figure is an inferred section (at top) and floor plan (at bottom.) The area depicted is the flattest, most buildable portion of the ledge. [D. Lamp, 2006]

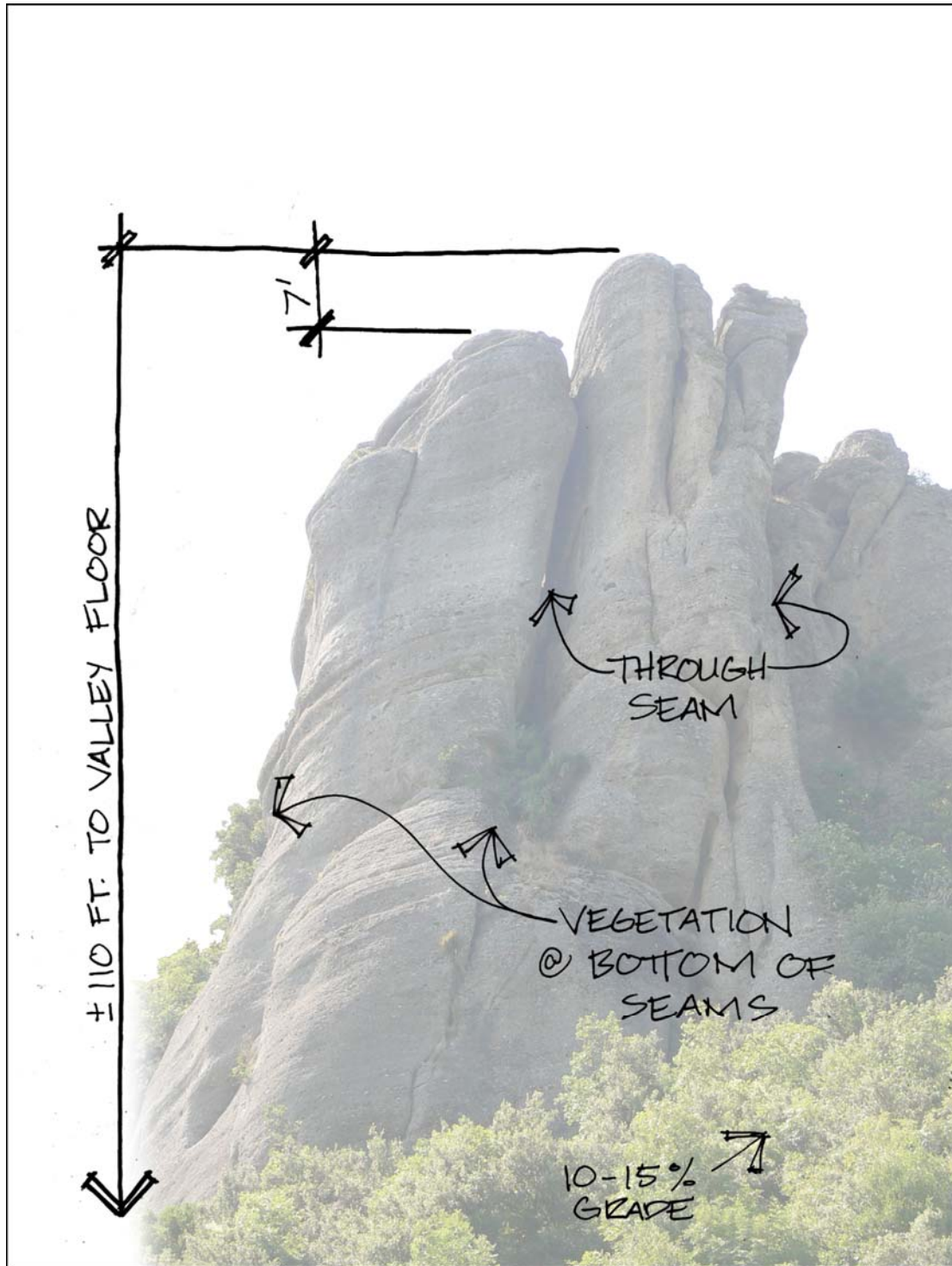


Figure 34: **SITE C: Cat's Church**

The figure depicts the some of the twisting verticality that categorizes this site. Several of these contorted rock formations rise up in sequence from the sloped valley floor to an almost constant height. [D. Lamp, 2006]

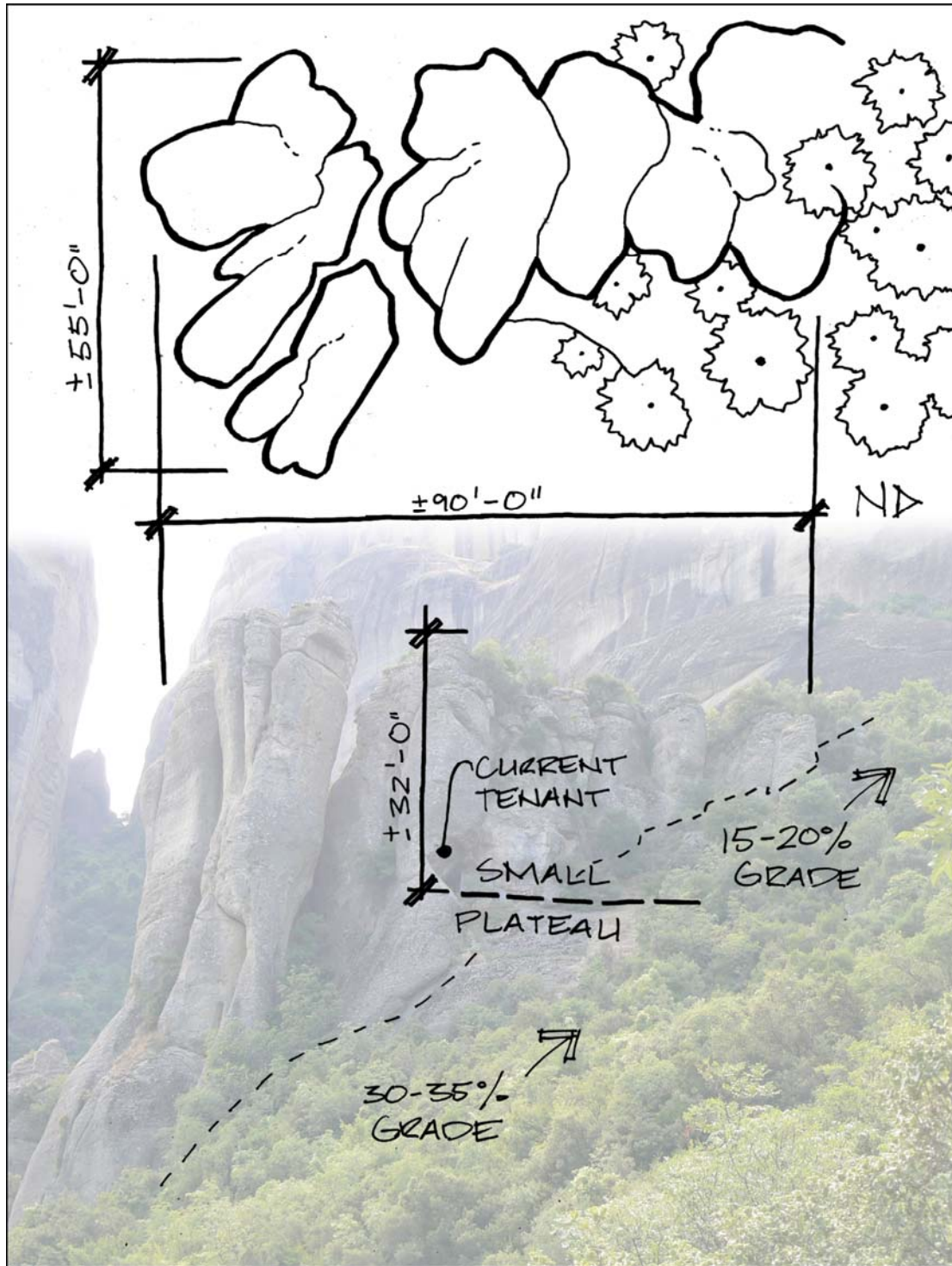


Figure 35: **SITE C: Cat's Church**

The fractured plateau nature of the site is more visible in this view. The individual columns of rock form a series of platforms that are roughly the same height, but separated by seams. The inferred floor plan above demonstrates the buildable surface at the upper elevation. [D. Lamp, 2006]

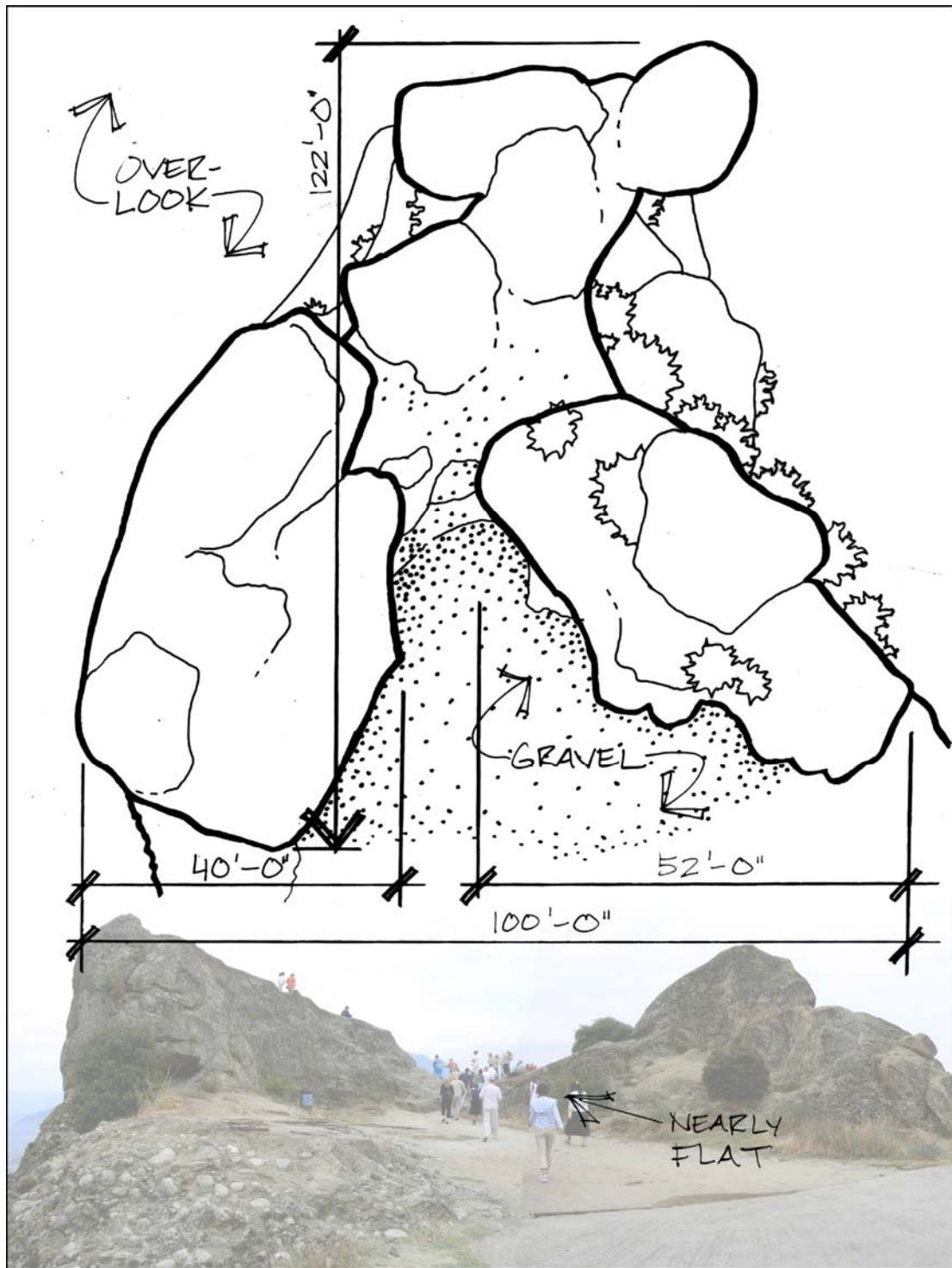


Figure 36: **SITE D: Panorama**

The figure depicts an inferred ground plan (above) and a view of the entry from a nearby roadway (bottom.) The site is very easily accessible (at the top level) and such is often used as a photo spot for tour groups, one of which is also pictured. [D. Lamp, 2006]

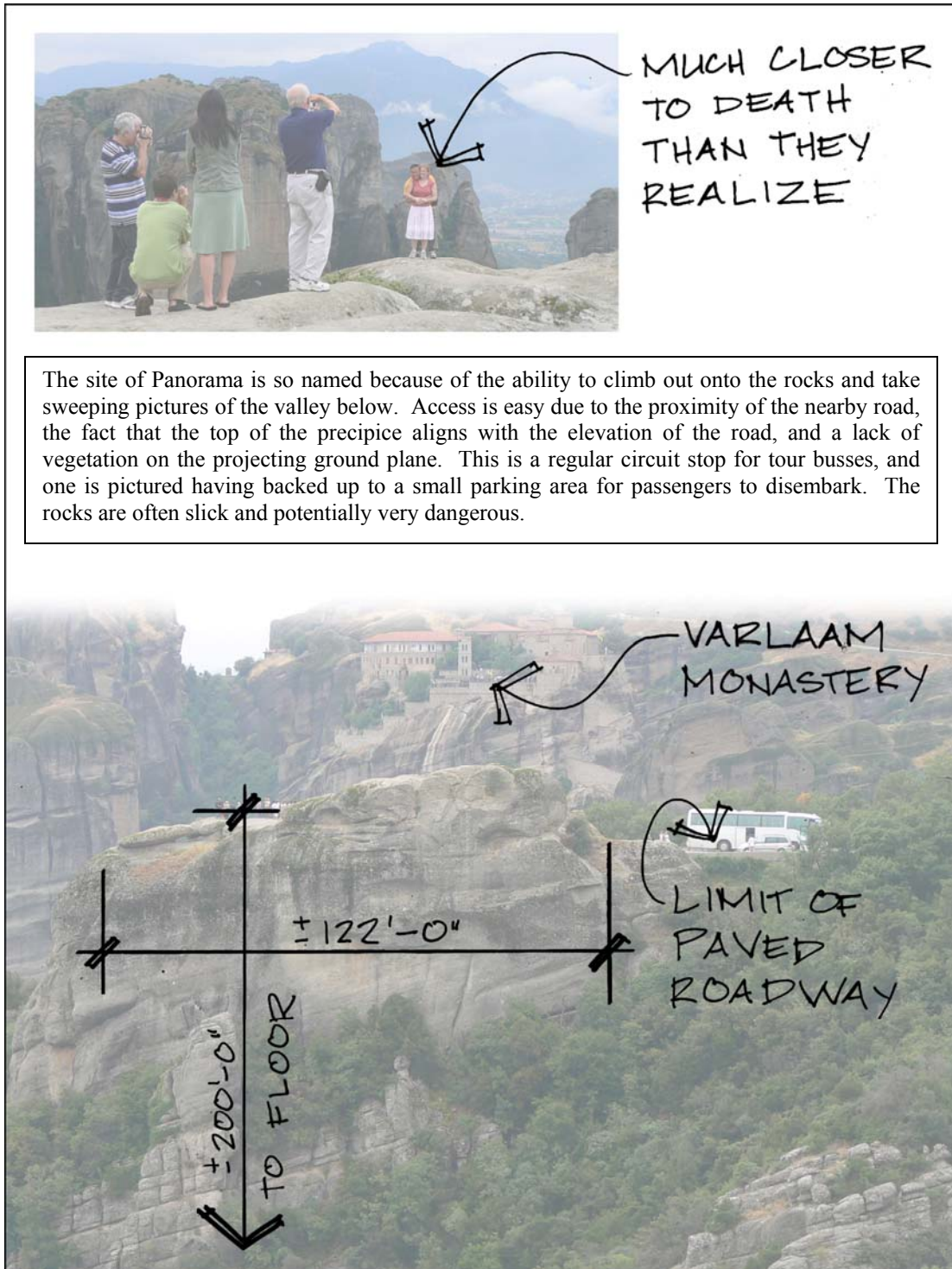


Figure 37: **SITE D: Panorama**

A more distant view depicts the site as a projecting finger out from the roadway to the side. From this location at least four monasteries are visible. [D. Lamp, 2006]

Chapter 4: Building Program



Figure 38: The interior workshop area of the Megaron Monastery has been restored as a sort-of museum for tourists to enjoy. The image shows the cluttered, “organized chaos” that results from so many people living and working in a confined space. Flexible programming of potentially overlapping spaces, especially on smaller sites, is key. [D. Lamp, 2006]

This chapter...

- ... introduces the building program as a combination residence hall, church, and work area.

- ... outlines the functional processes that are required for a monastery to sustain itself.

- ... provides a detailed description of each program piece and the function associated with it. No numerical values are assigned, as site constraints will inform that beginning in the next chapter.

A monastery can be succinctly defined as the place for monks to live and work. To that end, the monastic program should be understood as having **triple functions: a residence hall, a church, and a workshop**. Prayer consumes just under half a monk's waking life, and the remainder is available for church vocation of some kind. The specific employment of the monks in residence varies from monastery to monastery, and then from monk to monk. The case was made in chapter two for a hostelling function within the new monasteries, and as such at least some of the monks' occupation will be devoted maintaining that function in the way of washing sheets, cooking meals, cleaning, etc.

It is assumed that a monastery of more than five or six resident monks who are devoted to inn keeping would have manpower to spare, allowing some monks use of a workshop area for another vocation, be that administrative, academic, or in the production of a traditional foodstuff. This vocation is not programmed herein, but flexible space is allotted for its use.

The program list below does not attempt to quantify any of the spaces that it lists. It is assumed that the character of, and spatial relationships within the proposed buildings are site responsive, and as such it is difficult to predict the sizes and adjacencies that are even possible, let alone preferred. In this regard the **program is determined by the site** as well, in that a small site such as Alyssos' Mouth cannot house the numbers or facilitate as many activities as a larger site, but makes up for that by necessitating a far more intimate experience. The purpose of the exercise is to demonstrate the terrain's governance over all other aspects of design. There are no ideal program sizes yet, as the sites will inform that.



Figure 39: The winding, difficult approach to Agias Triada Monastery. The area bounded by the black outline represents either new construction or demolition done to the rock face in order to facilitate the creation of steps that wind up the rock and to the monastery above. Such extensive site rationalization is common amongst the monasteries of Meteora. This is demonstrative of the effort that must be exerted in order to turn these former Byzantine fortresses into contemporary tourist attractions. Access is the key issue in the design of further monasteries. [D. Lamp, 2006]

1. Common Program – Open to the (paying) public

A. Exterior Approach and Stoop

This is more of a sequence than a particular space, involving the rationalization of the approach to the door. The approach to the monastery may in fact be very long and elaborate, as the terrain would warrant. This includes the primary means of vertical ascent, either by footpath and stair or lift. The existing monasteries employ a combination the two approaches: a winding, often difficult footpath and stair is the primary

means of visitor access, while an enclosed, private cable car is used to transport resident monks and supplies to the monastery. This dual approach seems valid for the program at hand. In the case of a lift, reasonable access should be allowed to the entry, workshop, and storage areas from the lift platform for the purposes of supply delivery.

B. Entry Vestibule, Ticket, and Reception

This may be a small area directly adjacent to the entry where a monk at a desk would greet visitors. Most people will pay 3€ for a ticket and brief access to the public spaces of the monastery. A far fewer number will have reservations to stay the night, in which case the monk will escort the patron to the nearby office for a more formal check-in. This desk may also sell postcards, books, and icons on a limited basis. Being a newer and hostelling monastery, the presence of a gift shop is not required; each of the existing monasteries has one, all selling essentially the same thing in varying quantities.

C. Offices (2X, if space permits)

The elder clergyman presumably occupies the administrative areas. It is assumed that one such space will constitute a typical office, in which overnight guests may check-in. Medium and large sized monasteries should feature an adjoining office room for clerical storage, a fax and copy machine, and another workspace for a monk acting as an administrative assistant. The spaces should be located off primary circulation but not in a prominent location, and near to the front door.

D. Chapel

The chapel is the spiritual heart of the monastery. This is a small, designated religious space high ceiling. The elder clergyman is expected to lead prayer and conduct mass here, and as such the space must be sized to comfortably accommodate pew-style seating for the total maximum-programmed number of monks and guests simultaneously. This area necessitates access to main circulation, though not necessarily in a prominent location. The chapel should be reasonably close to the cloister, and as such have exterior access to that courtyard for additional prayer ritual. It is preferable that the chapel be readable from the exterior as a massing element. This area necessitates access to natural light at least at the ceiling, if not elsewhere.

E. Cloister

This is traditionally defined as an exterior courtyard enclosed by a colonnade on all sides. Ideally, the space should be large enough to facilitate the “cloister walk,” or a repetitive circuit sometimes walked by monks as a part of morning prayers. The walk is to be performed outdoors but under cover from the rain, hence the requirement of a colonnade on all sides. Light and air should be planned for as to allow a small, decorative garden in the center. The space should be contemplative, and while technically open to the paying public, it may be wise to limit their access to a vista or one colonnaded hall to preserve the quiet, natural feel. This area is also the housing of the ceremonial board of bells that call the

monks to prayer at various times during the day. The placement of this is generally non-ceremonial despite its generally being an interesting art piece. This is generally hung from a transfer beam between two columns within the colonnade.



Figure 40: The cloister at Agios Stephanos Monastery. The hanging “u” shaped metal piece is a prayer bell.



Figure 41: One of many dramatic observation areas at the Agios Nikolaos Anapafsas Monastery. Roussanou Monastery is visible on the rock in the distance.

F. Observation Area

This area is a necessity for the paying public, as it is in large part what they have come to see. Put simply, it is a dramatic location, preferably exterior but within the compound itself, where tourists can take in a panoramic vista and take photos of themselves against that background. This is an area where people will naturally want to sit and rest after the (presumably taxing) ascent to the monastery, and as such it should be

reasonably sized and have seating opportunities. This is in a sense the reward for coming. This space could be executed as a part of another space, the cloister for example, however attention should be paid to the paying visitor's impact on the nature of more private spaces. It is possible that this area could be a rooftop terrace as well, which is a strategy employed by almost all of the existing monasteries in Meteora.

2. Rooming Program

A. Monk Cells

Monks are to be housed individually, in rooms of modest size. The rooms are to be furnished sparsely, with a desk, nightstand, double bed and wardrobe the only provided pieces of furniture. No television is furnished in the monks' rooms, however there is one in the nearby communal lounge. The rooms are to contain a sink and towel rack, however toilets and showers are shared. These rooms are potentially very small, as space on some sites is very tight. All monks' cells are to have direct access to natural light. The number of rooms depends on the size of the total program, however it is assumed that a monastery must have at least four permanent inhabitants to be viable.

B. Guest Rooms

Guests are to be housed in much the same way as the monks in rooms of similar furnishing. There is no television set, and only an in-room sink. The guest rooms may be slightly larger as space allows, but not necessarily better furnished or more comfortable.

It is assumed that these travelers have gone well out of their way for an authentic monastic hostel experience. To that end, they are treated to the same conditions and lifestyle that the monks enjoy. Similar in nature to hostels in Mount Athos, Greece, visitors are expected to rise in the early morning (as in 4:00 or 5:00am) for morning prayers. Just under half of a monk's day is consumed with prayer, however guests are generally not required to join the clergy in individualized prayer. Quiet and respectful behavior would tend to be the rule. Guests eat three modest meals per day, and separately from the monks themselves, unless numbers of each are so small as to render that segregation untenable. Wine is required at dinner. There is a sundown curfew, at which point a guest will be locked out of the monastery until public opening the following morning.¹⁷

C. Monks' Toilets

These are shared toilets for the monks in residence. A minimum of one toilet for every three residents is assumed, with appropriate partitions between. These rooms will have a single sink for washing, (since all rooms have a sink already.)

D. Guests' Toilets

These are shared toilets for the overnight guests, separate from the facilities for the monks themselves. A minimum of one toilet for every three residents is assumed, with appropriate partitions between. There is

¹⁷ It is unknown how serious the rule is enforced. The monks of Mount Athos are deadly serious about it and will leave a late traveler outside in the cold. The proposed program sizes herein suggest a far more intimate setting, and one in which exceptions could be made.

no male/female segregation. These rooms will have a single sink for washing, (since all rooms have a sink already.)

E. Monks' Showers

These are shared stall showers for the monks in residence. A minimum of one shower for every four residents is assumed.

F. Guests' Showers

These are shared stall showers for the overnight guests. A minimum of one shower for every three residents is assumed. There is no male/female segregation.

G. Lounge

This is a small communal space with a television, informal library, couches and coffee tables, capable of seating all of the total overnight guests and half of the resident monks comfortably. Traditionally monks would engage their guests in conversation and with specialty liquors, often a brandy made on-site. The monks at Agios Stephanos in particular were renown for making a homegrown red wine.¹⁸ This area constitutes an informal gathering area for the monks themselves. It is reasonable to assume the refectory may be configured to accommodate this function if space were to be limited. The lounge should otherwise be off the main circulation, near to the cells and rooms themselves.

H. Linen Storage

This is a closet in very close to proximity to the cells and rooms, for the purpose of storing bed linens, blankets and pillows.

¹⁸ Goodell, 501.

I. Laundry

This is an area for washing bedding. Its location may be very near to the cells and bedrooms, or away in a mechanical area, as space dictates.

3. Boarding Program

A. Refectory

This most closely resembles an academic dining hall in its configuration and furnishing. Where space permits, traditional long tables are used to seat hungry users in potentially very tight conditions, with cramped elbowroom. This room should be sized to be able to seat all of the total residents and overnight guests at once, if only in slightly cramped conditions. The refectory should be on from the main circulation and have direct access to the kitchen and preferably the cloister as well. It is reasonable to assume that prayers would sometimes be conducted here, especially at feasting or fasting holidays. The room may also be used in off-meal times as an informal gathering space. Access to natural light is preferred but not required, and high ceiling is preferred.

B. Kitchen

This is a small, industrial kitchen capable of being manned by several cooks at once and preparing food for at least as many people as the refectory can seat at once. Standard kitchen items are required, including refrigerators, stovetops, ovens, and work surface. The kitchen must have direct access to the refectory, pantry, and walk-in cold storage.

Reasonable access to the loading area is preferred.

C. Pantry

This is shelf storage space for the kitchen, which may or may not be a separate room, as space permits.

D. Walk-in Cold Storage

This is a small walk-in freezer. Access should be direct from the kitchen.

4. Work Program

A. Workshop Space

This area is designed as a sort of multi-purpose room in which monks may engage in whatever sort of employment they have been assigned. As stated above, it is assumed the primary employment of the resident monks is a hospitality function, be that cooking, washing, record keeping, ticket sales, etc. (The most time-consuming part of a monk's day is prayer, however that is assumed a given.) Larger monasteries will most likely have staff devoted to non-hostel related functions, in which case other employment is likely. Current monastic programs include community outreach, academic research and writing, book translation, a young monks' program, etc. Many monks are active participants in marketing and management of their church, and so manning a phone bank, data entry, and graphic design are not out of the question. There are also the more traditional monks roles, mainly tending of an orchard, garden or vineyard, and making of a specialty foodstuff, usually liquor or wine, for sale locally. The workshop space should be flexible enough to be

programmed accordingly. It is envisioned that a workshop space is needed exclusively in monasteries housing eight or more monks.



Figure 42: A workshop space at the Agios Nikolaos Anapafsas Monastery. This is a poor example of a usable workspace in that it is a converted dining terrace, and as such is poorly furnished and open to the elements. Proposed work areas would necessitate better, more contemporary furnishing, likely with computers and appropriate task lighting.

B. Storage Space

Shelf storage associated with the workshop space. This is only required of monasteries that feature a workshop area.

C. Loading Area

This area is the equivalent of a loading dock in a less dramatic site situation. In the event the monastery employs a lift for the transfer of supplies, a lift tower and machinery are required, in addition to area above and below for the staging of supply palettes. The lower area may be

incorporated as a part of the general approach to the monastery, and the upper area may be a part of the entry vestibule or stoop. This is required of all monasteries regardless of size.

5. Miscellaneous Program

A. Common Toilet

This is a single toilet and sink associated with the primary circulation. It is not for public use; in the great and long-standing European tradition, there are no public restrooms offered.

B. Library

A library space is required, but may be as little as three bookcases in the Refectory or Lounge, and may be as large as an entire room with designated reading areas, depending on the total program size. The library warrants access to natural light and a relatively quiet situation.

C. Exterior Garden(s)

Gardens, vineyards, and orchards are traditional land uses around monasteries in general. Due to their precarious site situation, many of the monasteries of Meteora have little or no arable soil, and those that do tend to own it on the valley floor below. Several have built terraced gardens in what meager space could be allotted on the tops of the rocks, and have presumably imported soil from the valley floor in which to plant small gardens. This is a preferred option, but may not be feasible on all sites.



Figure 43: The gardens at Agios Stephanos Monastery. There is little to no natural soil atop the rocks themselves, and so the very pleasant garden pictured here is made from soil imported from the valley floor. Public access is not allowed, most likely to avoid the trampling of plants, but public views are facilitated into it and into the valley beyond. [D. Lamp, 2006]

D. Mechanical Space

10% of total GSF should be allotted for mechanical space as a rule.

However, specific climate control systems and utility execution are a matter of design. This issue is unresolved at this time.

Chapter 5: Design Strategies



Figure 44: Overview of the Agios Nikolaos Anapafsas Monastery. The monastery is an excellent example of a composition of built form and landscape, such as one does not seem complete without the other. The building is rational, yet highly responsive to the terrain upon which it sits. At times it is difficult to distinguish where one ends and the other begins. [D. Lamp, 2006]

This chapter...

... concludes and summarizes the lessons learned from three chapters of site analysis.

... states a methodology for design based on addressing sequential logistical issues.

... begins the process of design by stating and explaining diagrammatic solutions to the first two logistical issues: massing strategies and means of access.

Once again, the purpose of this exercise is to demonstrate the role of extreme terrain on the process and product of design. In order to accomplish this, a rationalized design process must be formulated and documented. The use of multiple sites allows parallel processes of roughly same timing, duration, and scope.

Chapter one identified Meteora as an appropriate venue for study because of the local precedent of building on extreme topography, but also because of the phenomenal aesthetic composition that results from the combination of building and site. This dramatic composition is the reason Meteora has become a site for tourism. A successful design will seek not to limit or hide damage to the scenery but rather will prove to be an asset and a contemporary addition to the spirit of the monasteries therein. **This design exercise is an opportunity to improve upon the composition of building and site.**

Chapter two examined the area in greater detail and revealed that the monastic hostelling function would cater to an underserved demographic in Meteora, which is the rugged backpacker. This chapter also provided useful imagery and analysis of the existing monasteries that help to elaborate upon the sense of composure that exists between the monasteries and their rocks. An identical program, similar sizes, similar Byzantine styles, and locally driven material palettes indicate that the monasteries are in many ways indistinguishable from each other. The most successful compositions did stand out in terms of the use of their site; a more dramatic setting extenuates and extends the natural vertical planes that end at the precipice of a cliff. **The most dramatically composed monasteries are those that appear like they grew from the form of the cliff** upon which they sit.

The use of four sites, as identified in chapter three, ensures that different terrain conditions are represented and compared along the process of design. It makes sense to structure and compartmentalize the design of the monasteries in a way that compliments the division of sites. A matrix-style system of design and documentation allows the simultaneous consideration of similar design constraints on each site. The establishment of a roughly linear set of logistical issues allows for major design decisions to inform less crucial ones in sequence. Below is a list of the logistical issues studied and solved as part of the design of each site:

#	Key Question	Issue	Informing Constraints
1	What is physically possible on this site?	Building Massing	1.) Preservation and addition to the sense of the crucial building/landscape composition. 2.) The maximum build-out available on each site, on the sites where this is a factor.
2	What is physically possible on this site?	Site Access	1.) Building massing informs the probable points of entry and supply access. 2.) Connection to, and alteration of, existing vehicular and pedestrian pathways. 3.) Reasonable vertical limits of vehicular and pedestrian movement.
3	What is the best way to go about this?	Construction Methodology	1.) Building massing informs the kinds of spans and materials required. 2.) Site access greatly influences construction staging and the means with which material can be hauled onto site.
4	What is the best way to go about this?	Structural Systems	1.) Building massing begins to dictate the necessary structure involved. 2.) Construction methodology would more easily facilitate one type of material over another. 3.) Local conditions and precedents.
5	How does the resulting building meet the composition criteria?	Spatial Arrangement and Character	1.) The fit of the program to the building massing. 2.) The approach and dramatic vista through which the building is experienced. 3.) Visible structural systems and material palettes in keeping with the setting.
6	How does the resulting building meet the composition criteria?	Building to Site Aesthetics	1.) Does the monastery add to the composition ?

Figure 45: A list of the key logistical issues involved in the process of design. The sequence is designed to cascade so that the resolution of number one informs the design of number two, and so on.

The presentation of four parallel sets of information is then a logical matrix, such as the one displayed below. The intent is to be able to simultaneously track the evolution of a specific site while comparing critical issues across the entire exercise.

Comparison of 4 Site Solutions Based Upon Sequential Logistical Issues											
	Massing		Access		Construct.		Structure		Character		Aesthetics
Site A	Solution		Solution		Solution		Solution		Solution		Solution
Site B	Solution		Solution		Solution		Solution		Solution		Solution
Site C	Solution		Solution		Solution		Solution		Solution		Solution
Site D	Solution		Solution		Solution		Solution		Solution		Solution

Analysis of Site Solutions Across Independently logistical Issues											
	Massing		Access		Construct.		Structure		Character		Aesthetics
Site A	Solution		Solution		Solution		Solution		Solution		Solution
Site B	Solution		Solution		Solution		Solution		Solution		Solution
Site C	Solution		Solution		Solution		Solution		Solution		Solution
Site D	Solution		Solution		Solution		Solution		Solution		Solution

Figure 46: Diagrammatic matrices indicating the theoretical structure of the design exercise. These matrices are designed to provide diagrammatic representation of the issues and solutions that are a necessary part of design process. The top chart indicates the preference to read the resultant materials by issue, so that one can ascertain how the role of site access (for example) impacted the design of each site. The lower chart uses the same information to provide the ability to evaluate each site independently across its entire design process.


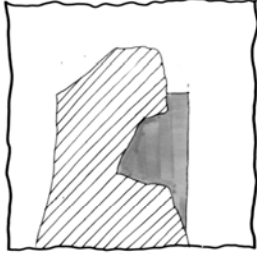



Site A: Alyssos' Mouth Massing Strategies	
<p>Alyssos' Mouth is a small cave, with a flush build-out of approximately 3200 square feet (though more is possible past the face of the cliff.) Massing is extremely difficult, and programmed spaces must overlap and share uses.</p>	
<p>Massing Strategy #1 Make as large a build-out from within the cave as is visually and structurally wise, and make do with what space is available. This is potentially a beautiful application, but is fraught with logistical concerns.</p>	
<p>Massing Strategy #2 Make an appropriately sized build-out within the cave, and allow program that does not reasonably fit to overflow into another mass on the backside of the rock. The two masses are then connected by a short (40'-0" to 50'-0" long) tunnel carved from the rock. This is designed to work with Access Strategy #4, see next page.</p>	
<p>Not Used</p>	
<p>Not Used</p>	

Figure 47: Diagrammatic massing strategies for site A


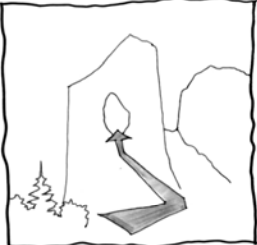
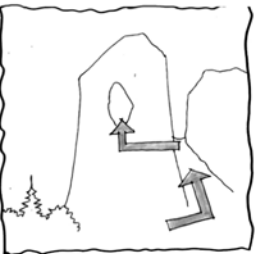
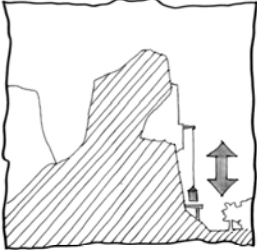

Site A: Alyssos' Mouth	
<p>Access to Alyssos' Mouth is complicated, more so perhaps than any other site examined. The site is a dramatic cave in the side of an otherwise vertical cliff. The distance down to the valley floor is approximately 150'-0".</p>	
<p>Access Strategy #1 Utilize the natural pressure fissure that occurs diagonally in the front (east/ northeast) face of the rock as a path to hew in a steep staircase. The strategy necessitates a lift for provisions, and makes a potentially dangerous ascent.</p>	
<p>Access Strategy #2 Utilize the steeply graded side of the rock as a means to create a set of stairs up to the level of the cave. A catwalk would then traverse the side of the rock and into the cave. The stairs would be far less steep than in strategy 1, however the aesthetic consequences of the catwalk may be poor. a lift is also required.</p>	
<p>Access Strategy #3 Use of a projecting lift that lowers to meet a platform or staging area directly underneath. This strategy is not conducive to move large numbers of people and must be used in conjunction with one of the above.</p>	
<p>Access Strategy #4 Use the steep grade on the side of the rock as a means to get around to the backside. From there, a short tunnel would lead into the cave itself. This is a potentially difficult and costly option, but has the best look to it (hidden) and is probably safest. A lift is still the best way to supply.</p>	

Figure 48: Diagrammatic access strategies for site A


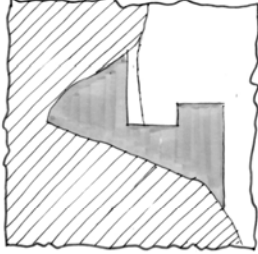
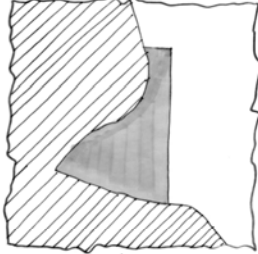


Site B: Pantocrator Massing Strategies	
<p>The pantocrator site consists of a sloping ledge in the north face of a medium sized rock. There is a substantial overhang which partially limits total build-out.</p>	
<p>Massing Strategy #1 Conceives of the building as three sections: one wedged into the crevasse as tightly as possible; a lower one in front, the roof of which could form a cloister; and a taller, outer section that rests precariously at the buildable edge of the ledge.</p>	
<p>Massing Strategy #2 Provides a more compact structure that hugs the back vertical face of the ledge and overhang. Visually, the mass reads as one volume on a discernible ledge.</p>	
<p>Not Used</p>	
<p>Not Used</p>	

Figure 49: Diagrammatic massing strategies for site B.



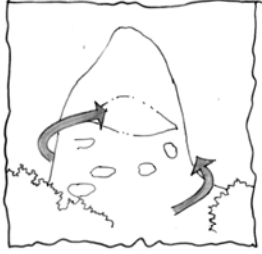
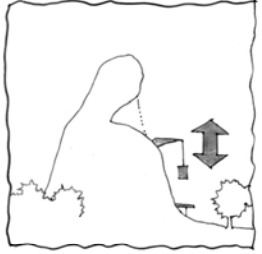

Site B: Pantocrator Access Strategies	
<p>Pantocrator occupies the north-facing ledge of a former monastery by the same name. The ruins that remain on the site indicate the former monastery's use of a tower lift system, similar to strategy #3. The total vertical distance from valley floor to ledge is about 100'-0".</p>	
<p>Access strategy #1 Utilize the existing caves on the front (north) face of the rock as natural landings for a progression of stairs to be hewn into the rock. The approach would be an interesting but fairly steep flight of stairs. The strategy is not conducive to supply loading and would necessitate a lift to compensate.</p>	
<p>Access Strategy #2 Create a longer, gentler progression that circumnavigates the entire rock once in a counter-clockwise circle, arriving at the ledge from the rear. This strategy also would necessitate a lift for supplies.</p>	
<p>Access Strategy #3 Use of a projecting lift that lowers to meet a platform or staging area directly underneath. This strategy is not conducive to move large numbers of people and must be used in conjunction with one of the above.</p>	
<p>Not Used</p>	

Figure 50: Diagrammatic access strategies for site B.


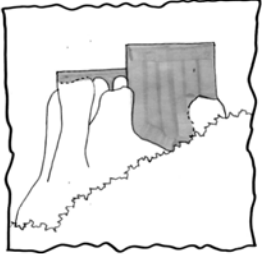

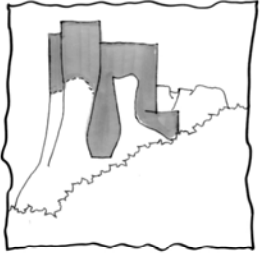

Site C: Cat's Church Massing Strategies	
<p>Cat's Church is an interesting site because of the fractured, separated plateau that makes the ground plane, and the twisted, tortured, gaunt looking rock pillars that form the highest point at the southern end.</p>	
<p>Massing Strategy #1 Unified mass on the more rationalized northern end of the ridge and a bridge to a platform on the southern high spot that might create a very pleasant garden or observation area.</p>	
<p>Massing Strategy #2 Considers the massing of the building as interconnected vertical elements, the same way that the rock presents itself. This approach would have a rear (north) entry and a dramatic form, as each vertical massing bridges and connects to the others.</p>	
<p>Massing Strategy #3 Does not accept the flat plateau as a ground plane, but rather the mass "seeps" downward between separations in the rock mass and can reach the ground below. The result is a blurring of the building and rock, but may result in an unnecessarily complicated spatial organization.</p>	
<p>Not Used</p>	

Figure 51: Diagrammatic massing strategies for site C.


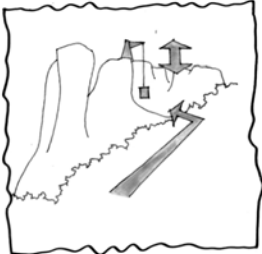
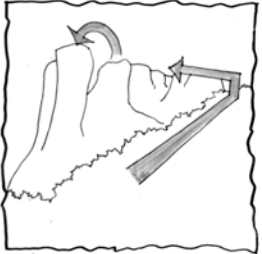
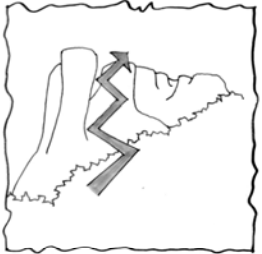

Site C: Cat's Church Access Strategies	
<p>Access to Cat's Church is not nearly as complicated as some other sites examined. The narrow ridge line descends into the ground on the north side of the site, allowing various walk-up strategies to be proposed.</p>	
<p>Access Strategy #1 Walk or drive up a medium grade trail up to a natural plateau below the ridge line. This area serves as a natural staging area for a projected lift for supply.</p>	
<p>Access Strategy #2 Walk or drive up a medium grade path (cars could only get so far before a turn-around) to where the ridge line meets the ground. The site is fairly flat out to the high (southern) tip of the rock line. This is one of few access strategies that does not necessitate a lift for supply.</p>	
<p>Access Strategy #3 Utilize the natural fissures and separations in the rock line to create a switchback stair that rises from the flat valley floor directly up to the entrance. This strategy would necessitate use of a lift for supply.</p>	
<p>Not Used</p>	

Figure 52: Diagrammatic access strategies for site C.



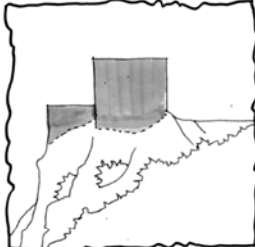
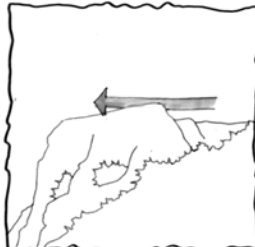

Site D: Panorama Massing and Access Strategies	
<p>Panorama is unusual amongst the sites selected in that it is actually very easy to get to, as a roadway runs past the top ledge. The name derives from the fact that tour busses stop to let passengers off here to take panoramic pictures of the valley below. This communal responsibility in a way offsets access as a design issue.</p>	
<p>Massing Strategy #1 Maintain the upper plateau for tourist use and rationalize it by building downward on the slope of the rock from that upper point. This approach has interesting applications for public/private separation, and a potentially very dramatic form.</p>	
<p>Massing Strategy #2 Creation of a large mass that would properly front the street. Public access would be facilitated by passage through, on the side of, or under the building to a designated observation platform.</p>	
<p>Access Strategy #1 Direct travel from off the roadway, which lies about 150'-0" from the eastern edge of the site. This is the route that tourist traffic uses currently.</p>	
<p>Access Strategy #2 Foot traffic from the valley floor below could be facilitated with a stair moderate (by Meteora standards) sequence of stairs along the slope of the rock. This approach alone is not viable, as most traffic would come from above, and supplying is difficult.</p>	

Figure 53: Diagrammatic massing and access strategies for site D.

Chapter 6: Conclusion



Figure 54: Rendering of one of the proposed monasteries.

[D. Lamp, 2007]

This chapter...

... discusses the process of design and comparison as executed for the thesis.

... outlines design for each site.

... exhibits the final output for each site.

The preceding chapters laid out a theoretical process for the design and construction of four monasteries. The reality of the process was far different from what was envisioned beforehand. The complexities of each site in particular mandated a far more consuming analysis of the terrain. Below is a list of major changes that resulted from the design exercise:

1. The model of an **issue-based matrix** was **set aside** almost immediately, in favor of specific, open-ended development of each site separately. This approach was far more conducive to architectural design.
2. In the process of design, **site B** was determined to be an overly problematic site and was consequently **not executed** further. The following reasons sum up the details of the site's difficulty:
 - A. The primarily North-facing site lent itself very poorly to passive solar and other site considerations. It is thought that a structure located here would perform poorly in terms of its systems.
 - B. The extremely long nature of the site and its approach (essentially wrapping around the whole of the rock on which it sits) mandates an awkward massing and does little to support the closed, sheltered nature of a monastery.
 - C. The existing ruins on the site proved a preservation challenge: the are the foundations of a former monastery, and as such are built in very close to the same locations as new walls would need to bare. Preserving or incorporating them into a new structure was problematic.
3. The comparative model of the thesis is maintained, however has changed from a process analysis to **programmatic study**. See below.

Figure 55: List of major changes to the thesis resulting since the beginning of the design phase. These represent a refinement of the execution of the thesis, not of the goals therein. [D. Lamp, 2007]

Much of the process of this thesis was re-conceived as a study in the way a common program is deformed by a variety of terrain types, and then comparing those results within the sample group. This comparison is of programmatic elements, to demonstrate how and if they have been altered by the site. The first step then is to establish the basic components of the program and find their “ideal executions.”

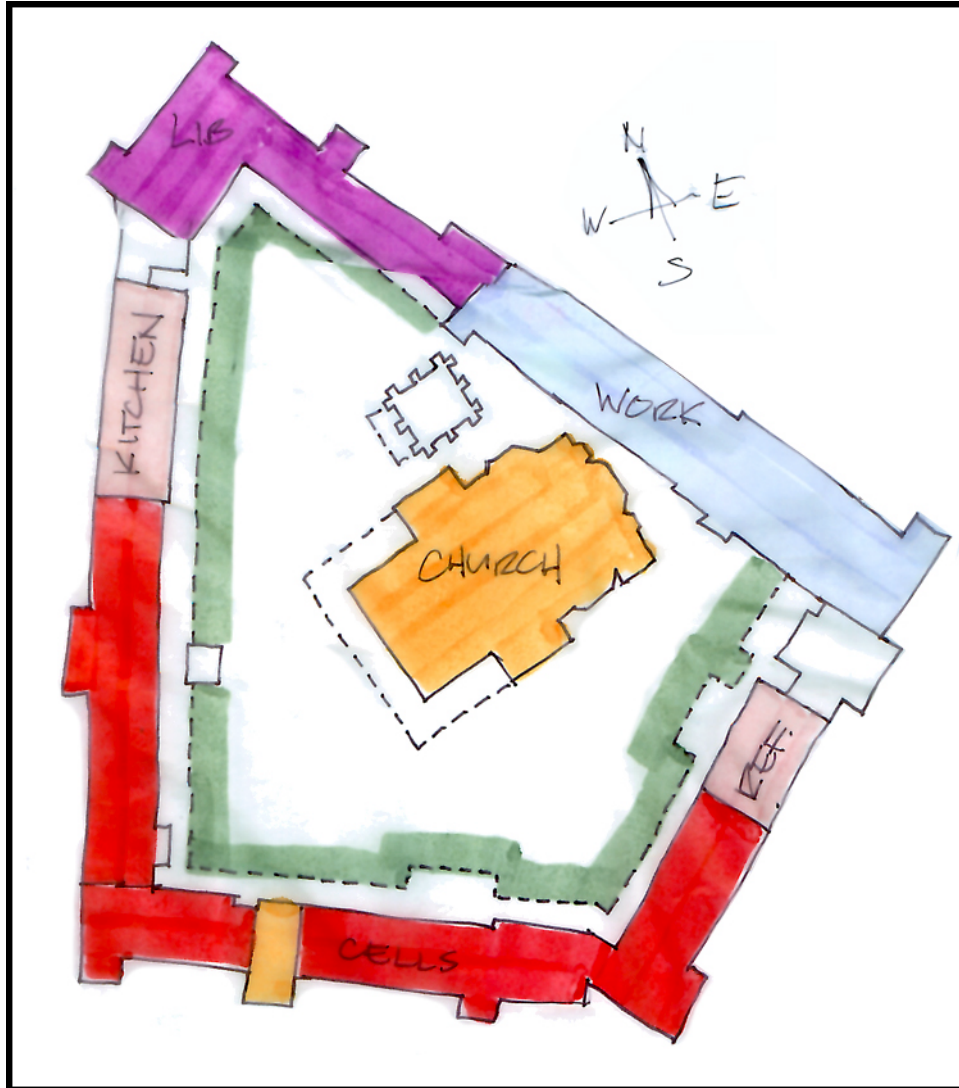


Figure 56: Diagrammatic plan of the Rila Monastery, located South of Sofia, Bulgaria. It is a good example of an Orthodox, Athonite monastery that is relatively unconstrained by terrain, (the site is nearly flat.) [D. Lamp, 2007]

Figure 56, one can see that an ideal monastery can be separated into three components; the chapel at the center, the cloister space which wraps around the chapel, and the monastic program that forms a sort of *poché* in the outer wall. The diagrams on the following page explore the implications the combinations of elements.

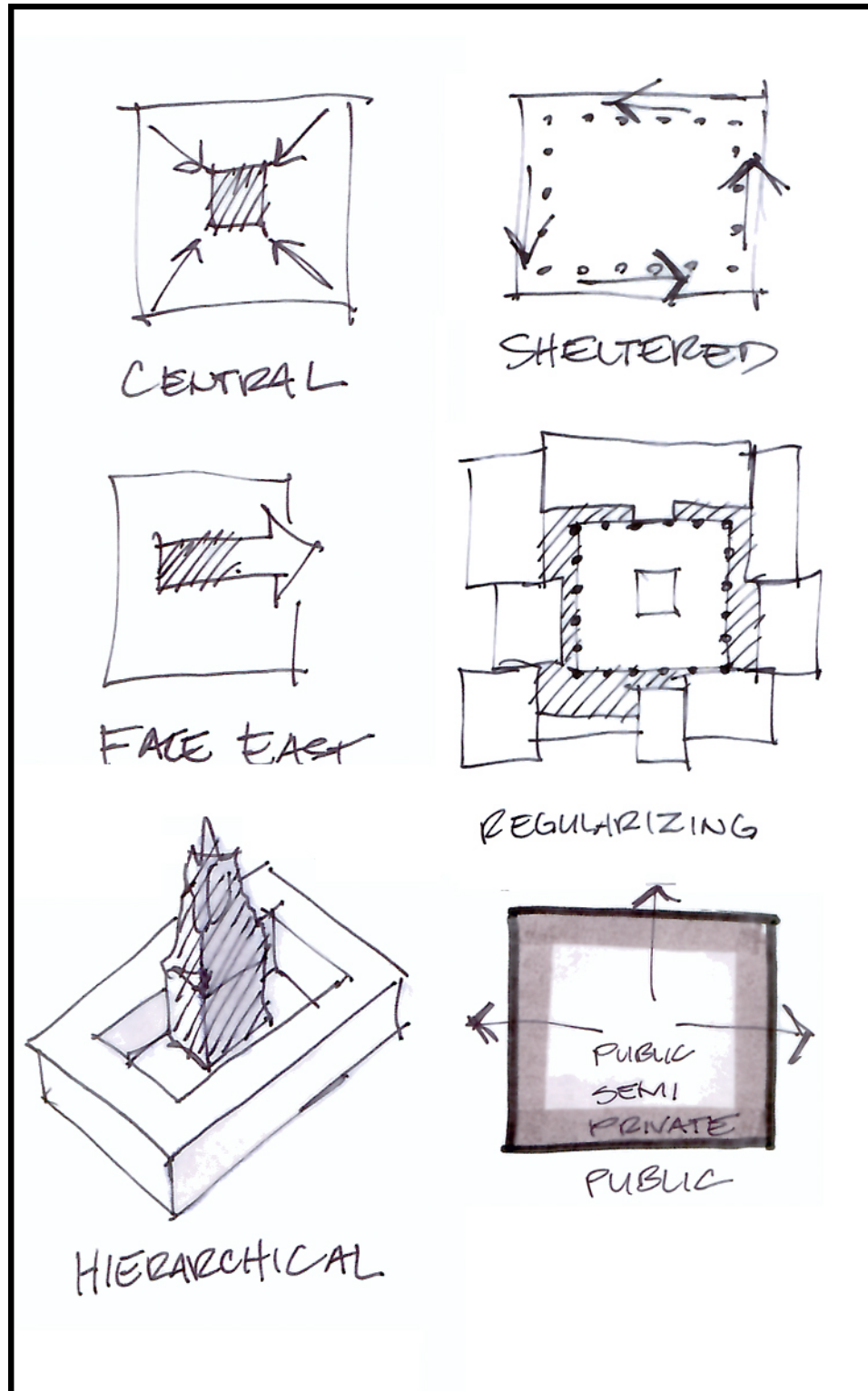


Figure 57: Diagrams illustrating the inherent relationships between the chapel, cloister, and poché material at the edge. [D. Lamp, 2007]

The next step in the process of resolution was to solve the program for the variety of sites to be tested. A “reading” of each site is necessary to determine how the site would arrange the program. For instance:

1. The chapel necessitates a hierarchical relationship relative to the site.
2. The cloister necessitates light and air for growing purposes.
3. The pochè spaces necessitate an edge condition, forming an outer wall.

On the following pages, from the initial site reading diagrammatic massing is explored, then the final massing solution. Floor plans, and finally rendered sections follow thereafter.

The thesis set out to test the role of terrain in the process of design, and to do so in specific, analytical ways. As it turns out, the formulation of a matrix in which to work is incompatible with the embrace of the idiosyncrasies and uniqueness of each site. This is a thesis that could only be done a piece at a time, solving each site in the best method possible and then to see if the results even compare at the end. The exercise was a way of taking a constant and applying it to an overpowering variable; the variable, the site, was in this case strong enough to completely overpower the constant, which was the program. In other words, the site is tough than the program. Thus, to truly solve each site as well as possible, one should not begin with a program as this thesis did, but rather the site itself, and then attempt to fit a program to each. In the case of sites C and D, the program was given too much weight to counteract the influence of the site, and such the terrain was not responded to properly. Site A was more successful, being that the terrain was more severe and the program was forced to change radically to accommodate it.

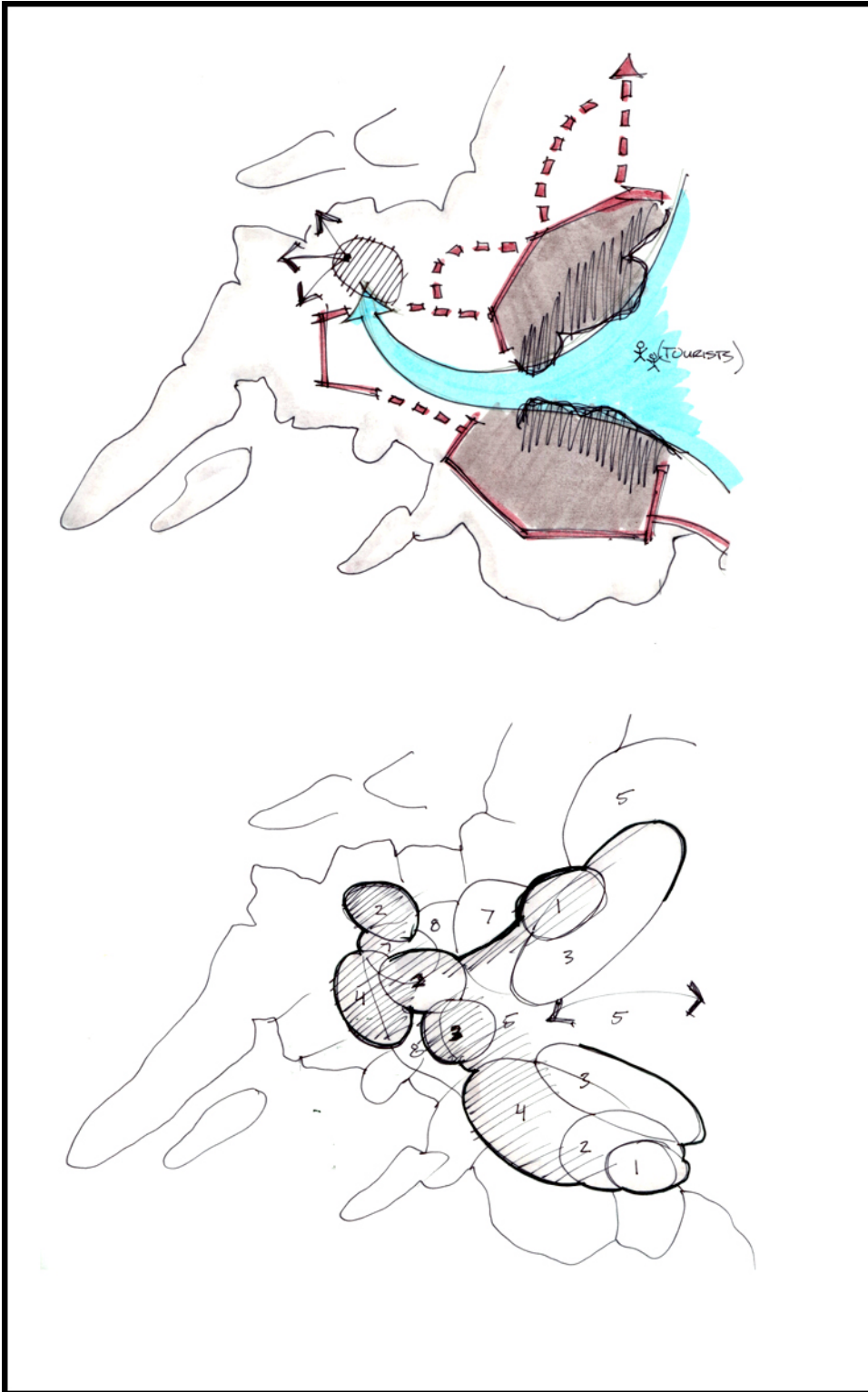


Figure 58: Preliminary analysis of site D

[D. Lamp, 2007]

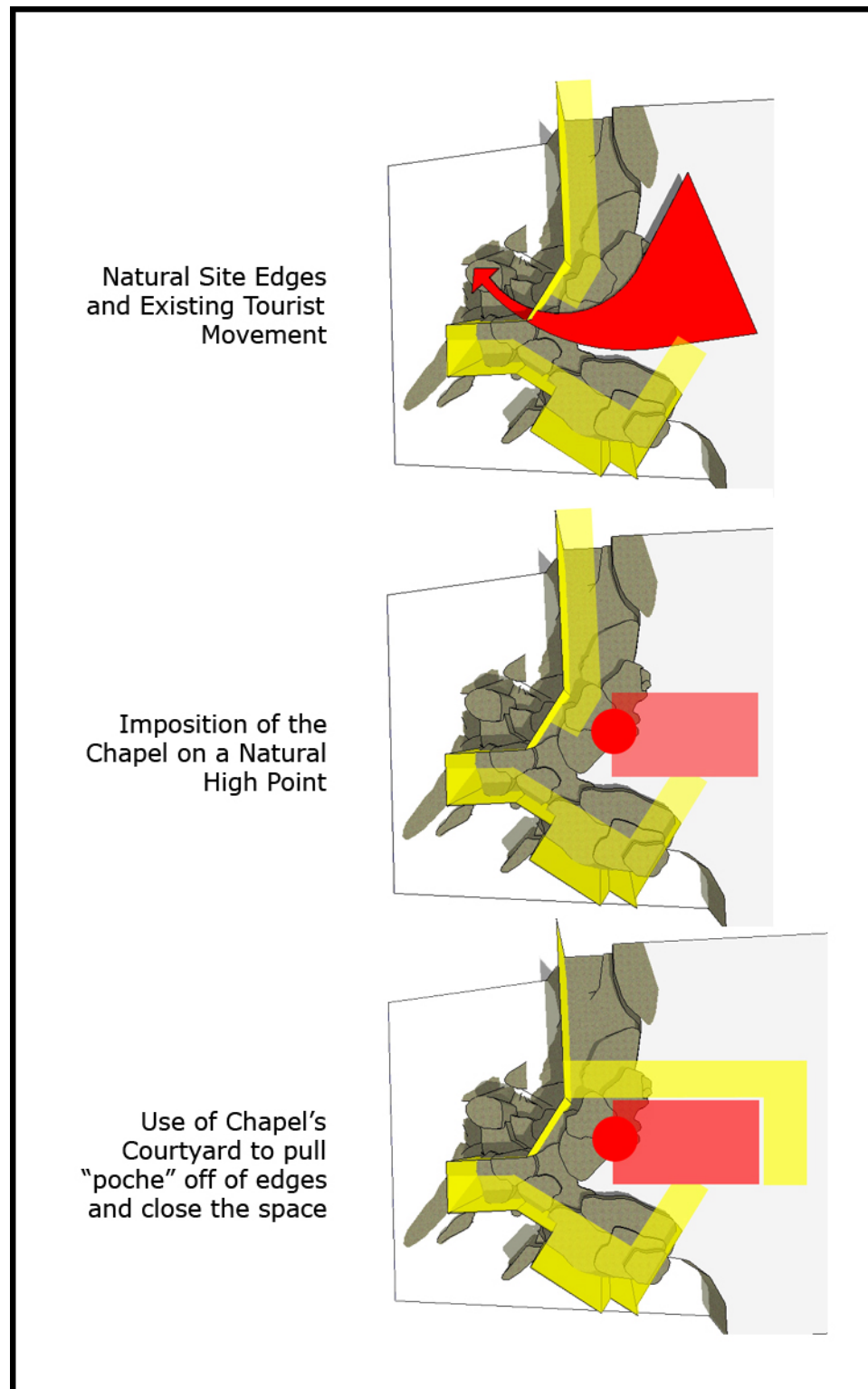


Figure 59: Applying the program to the site conditions.

[D. Lamp, 2007]

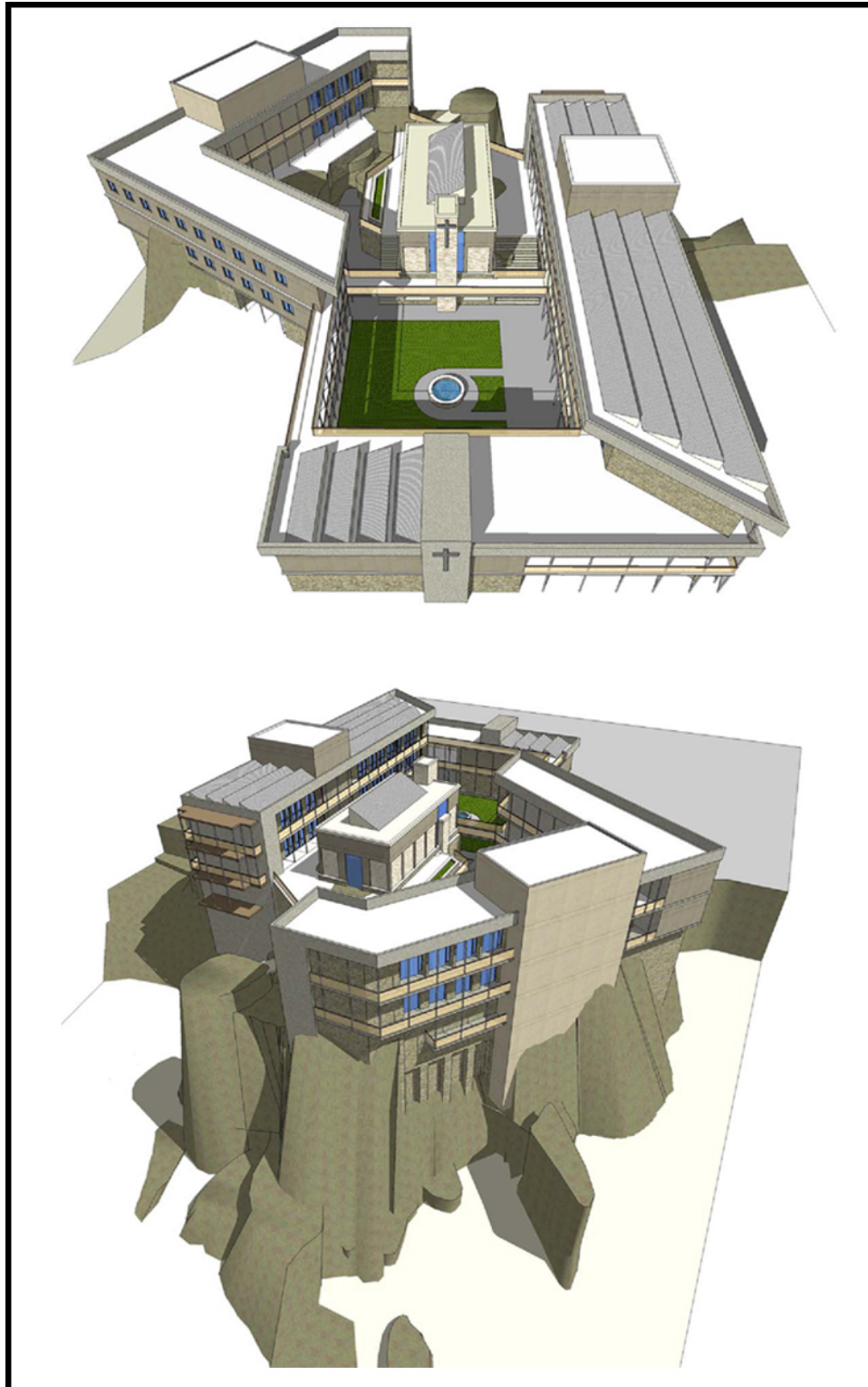


Figure 60: Views of the final massing product, looking West (above) and East (below)
[D. Lamp, 2007]

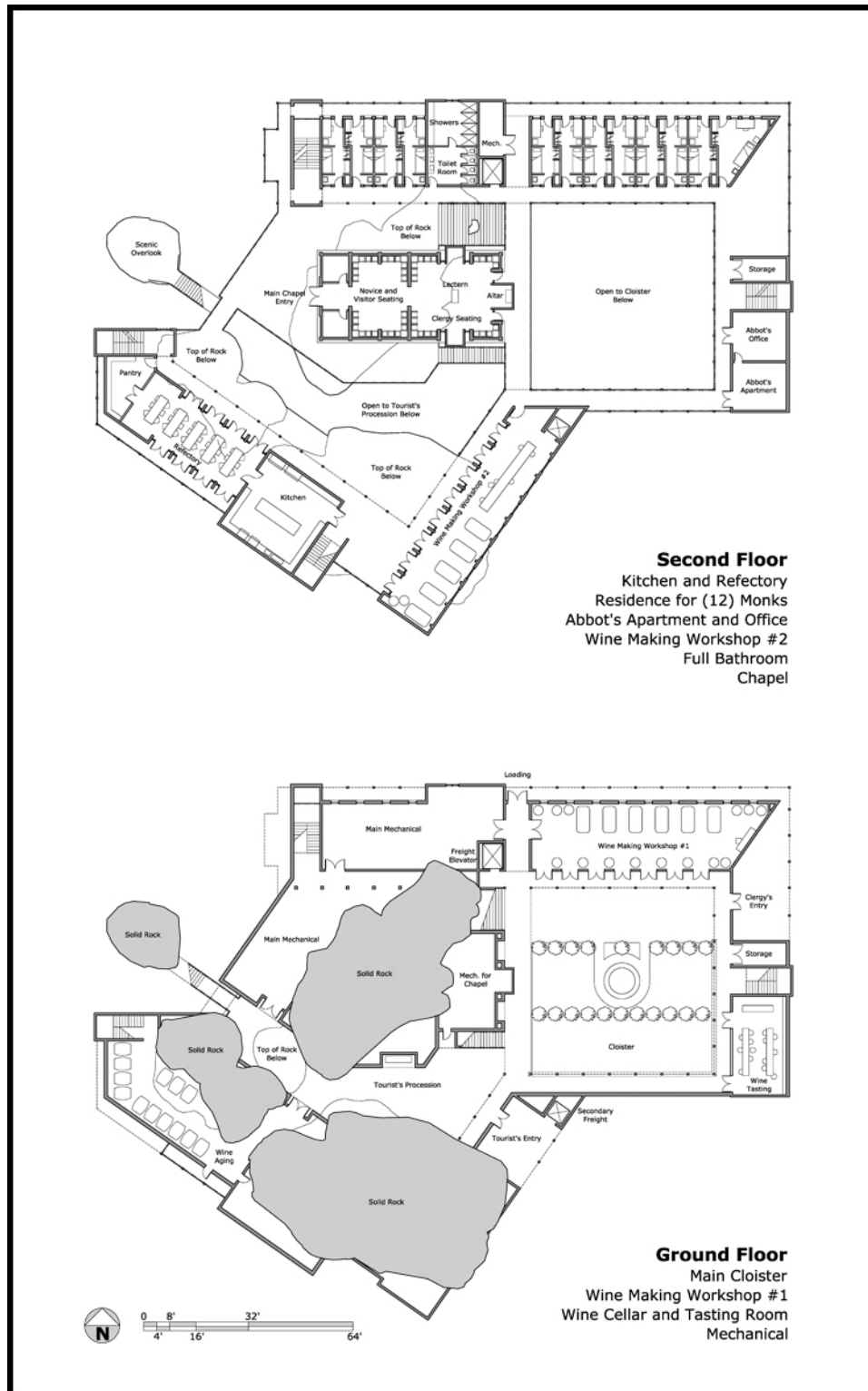


Figure 61: Partial set of floor plans (third floor and roof excluded.)

[D. Lamp, 2007]

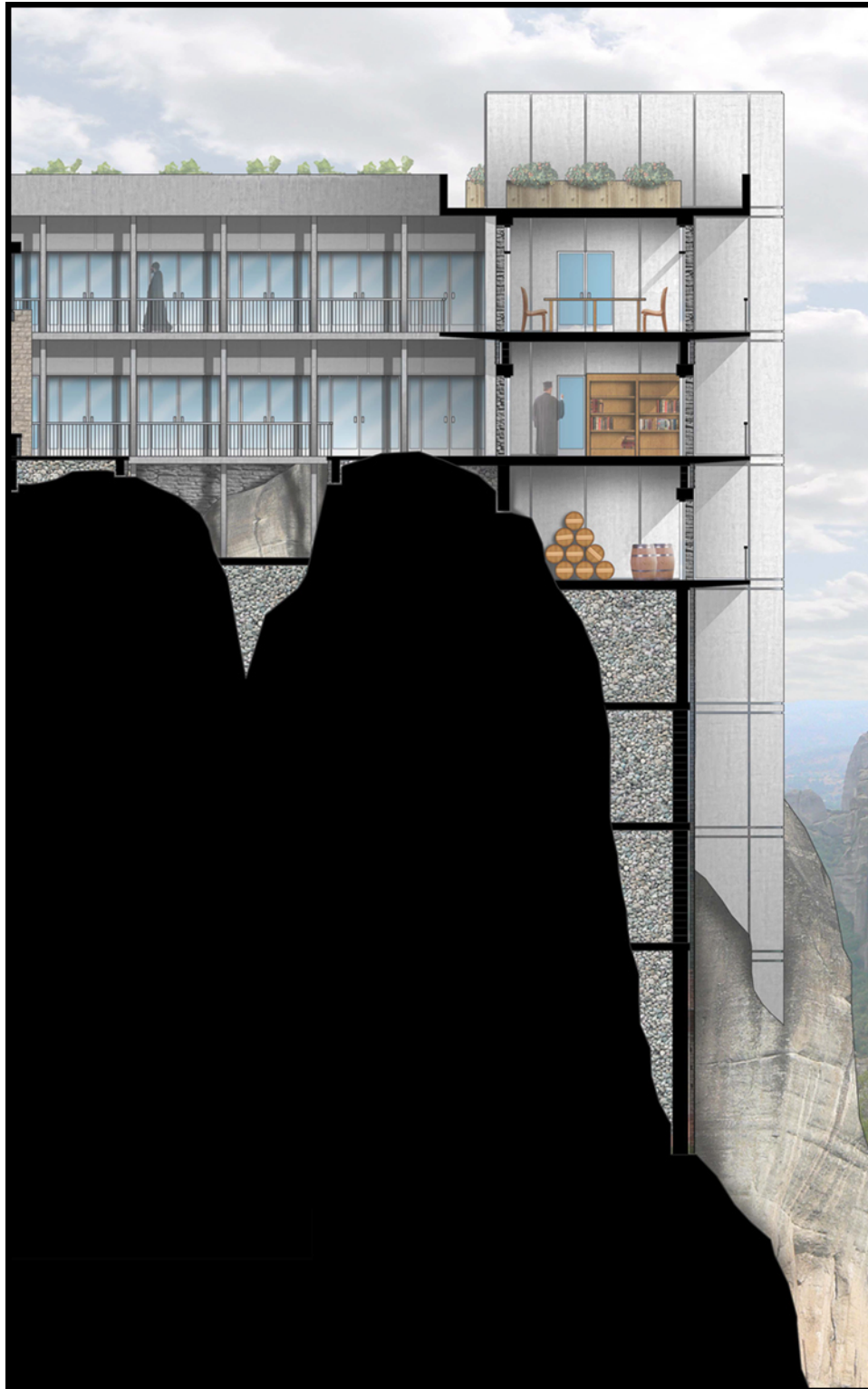


Figure 62: Rendered section through the vertical extreme at site D

[D. Lamp, 2007]

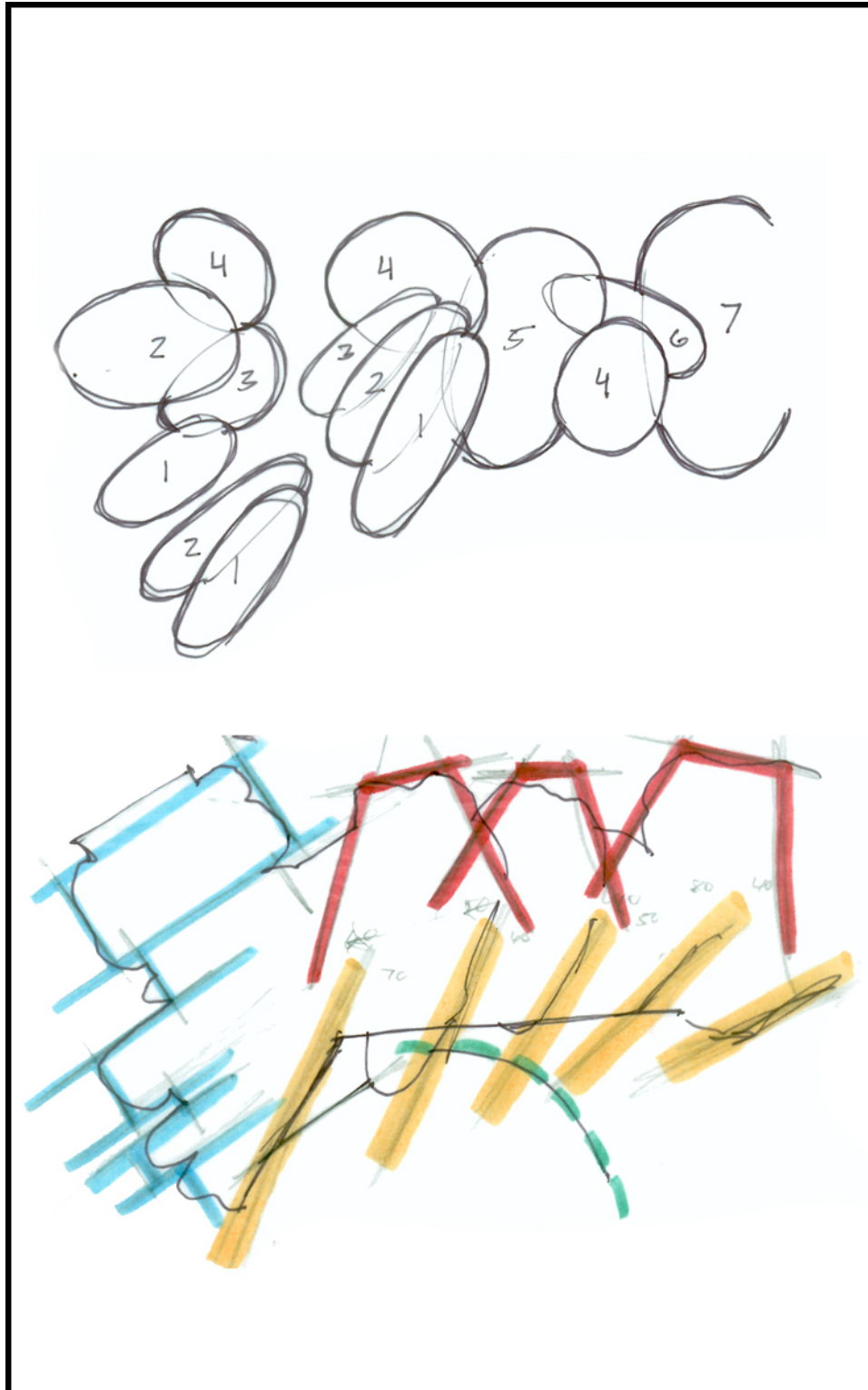


Figure 63: Preliminary analysis of site C

[D. Lamp, 2007]

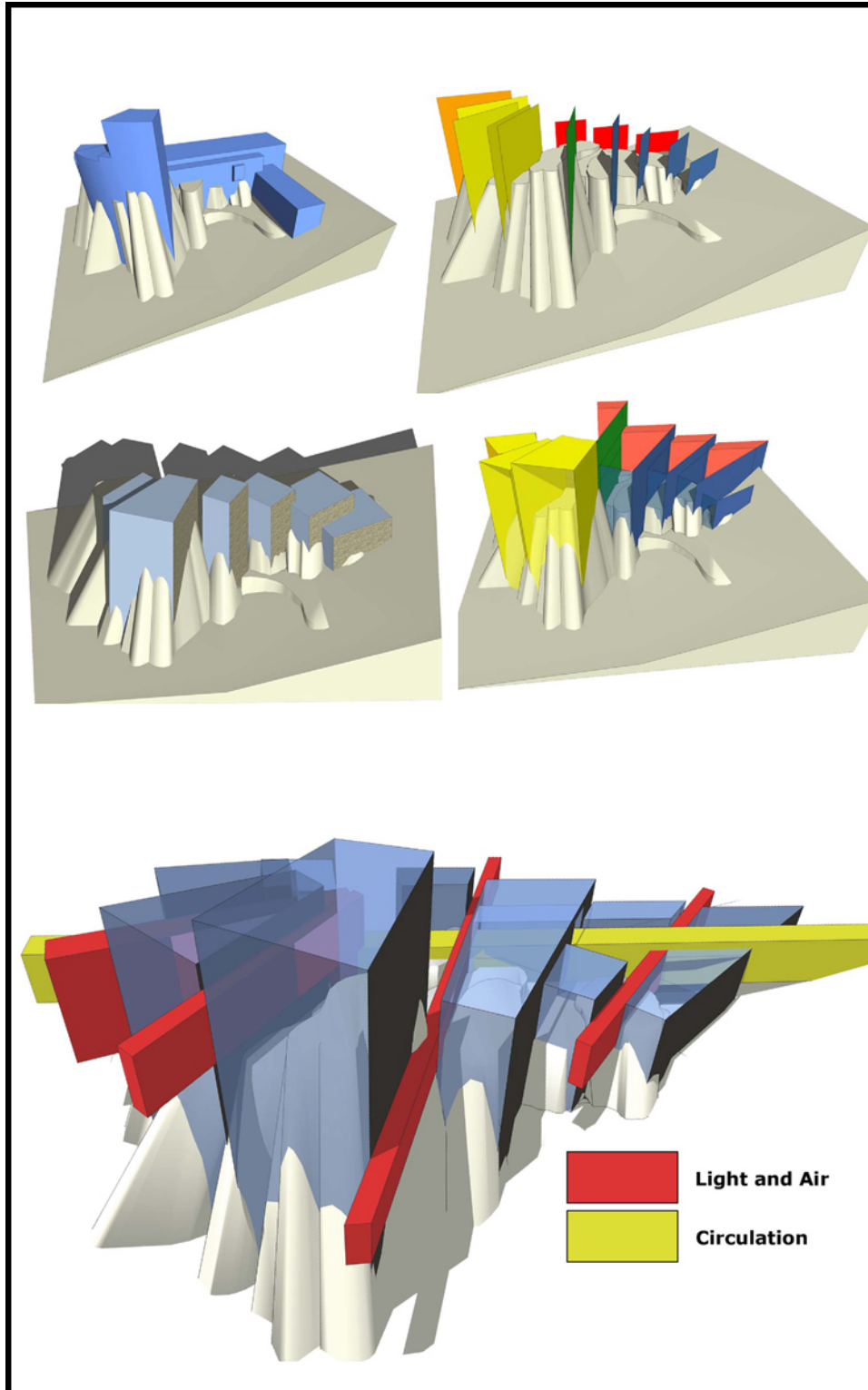


Figure 64: Further analysis of site conditions

[D. Lamp, 2007]

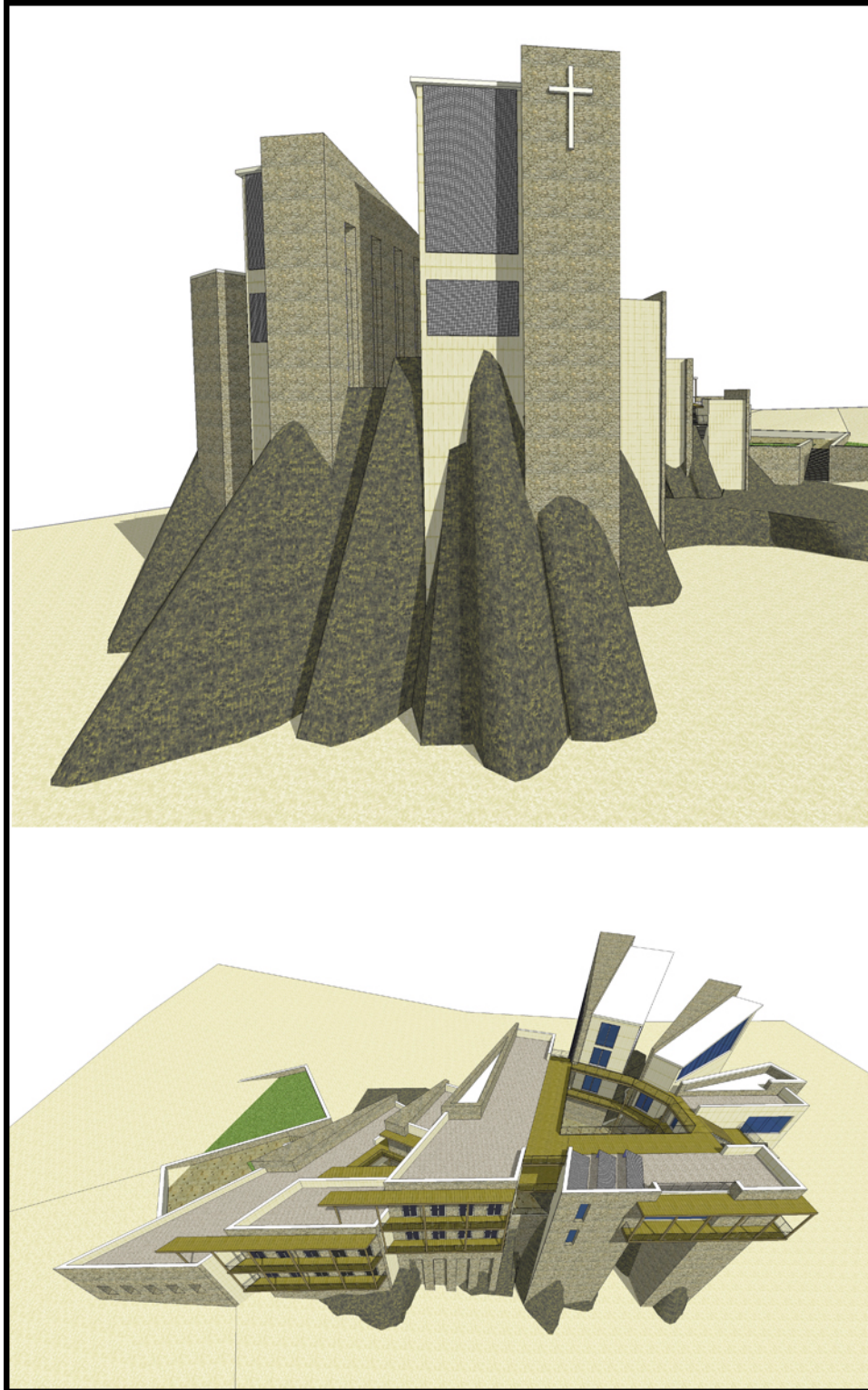


Figure 65: Views of the final massing product for site B, looking North (above) and East (below.)
[D. Lamp, 2007]

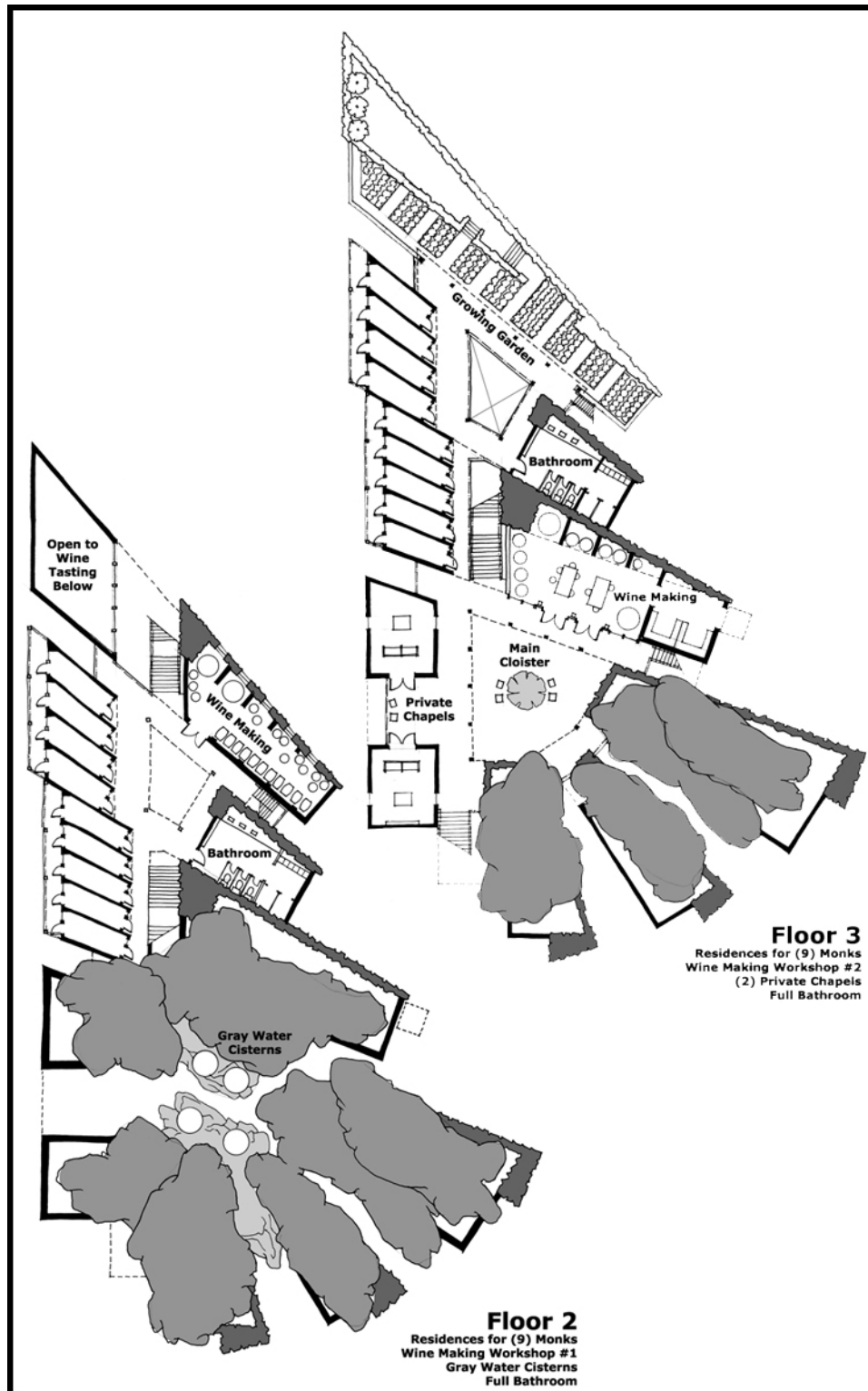


Figure 66: Partial set of floor plans for site C (Ground floor, 4th and 5th floors are excluded)
[D. Lamp, 2007]

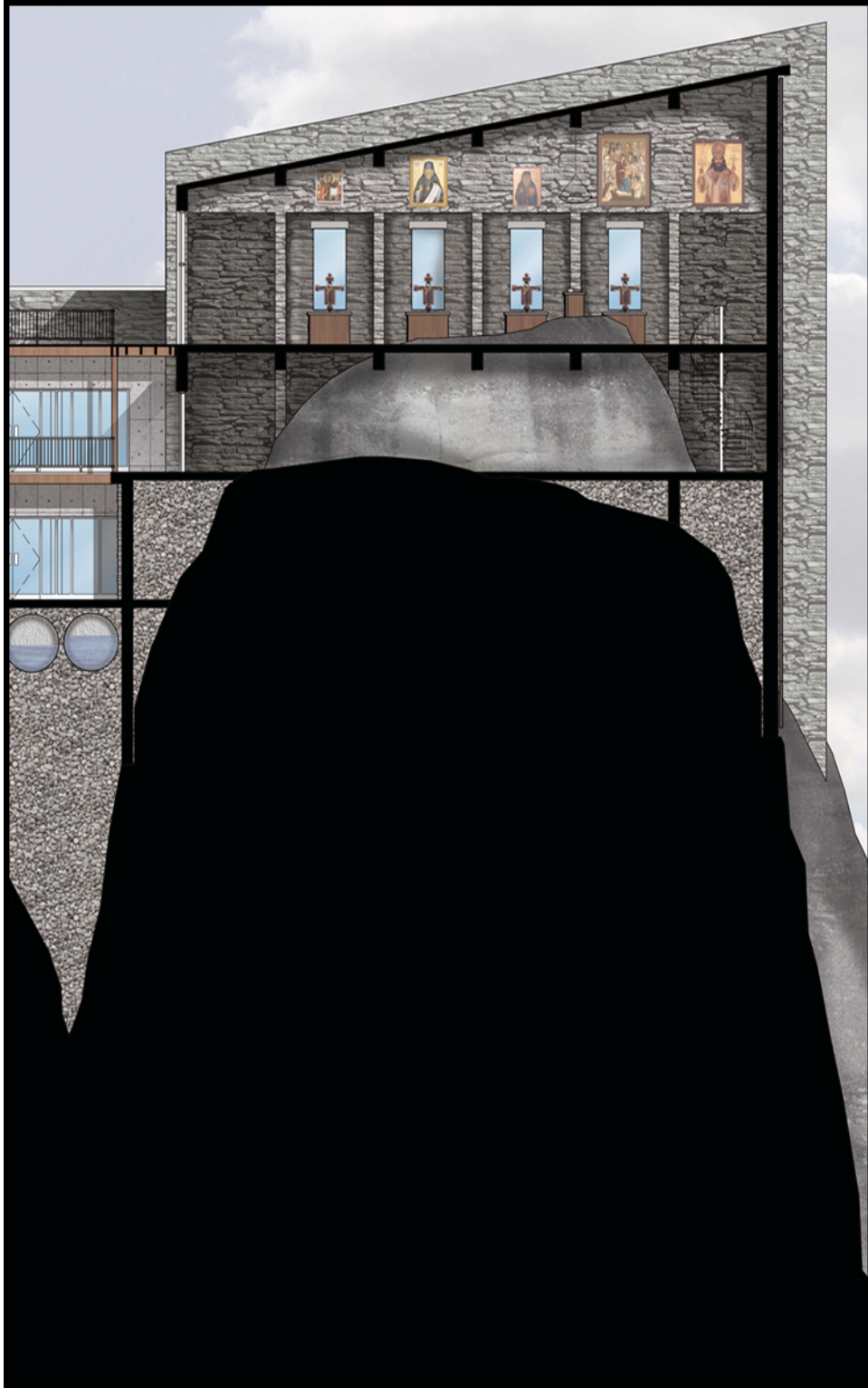


Figure 67: Rendered section through the vertical extreme at site C

[D. Lamp, 2007]

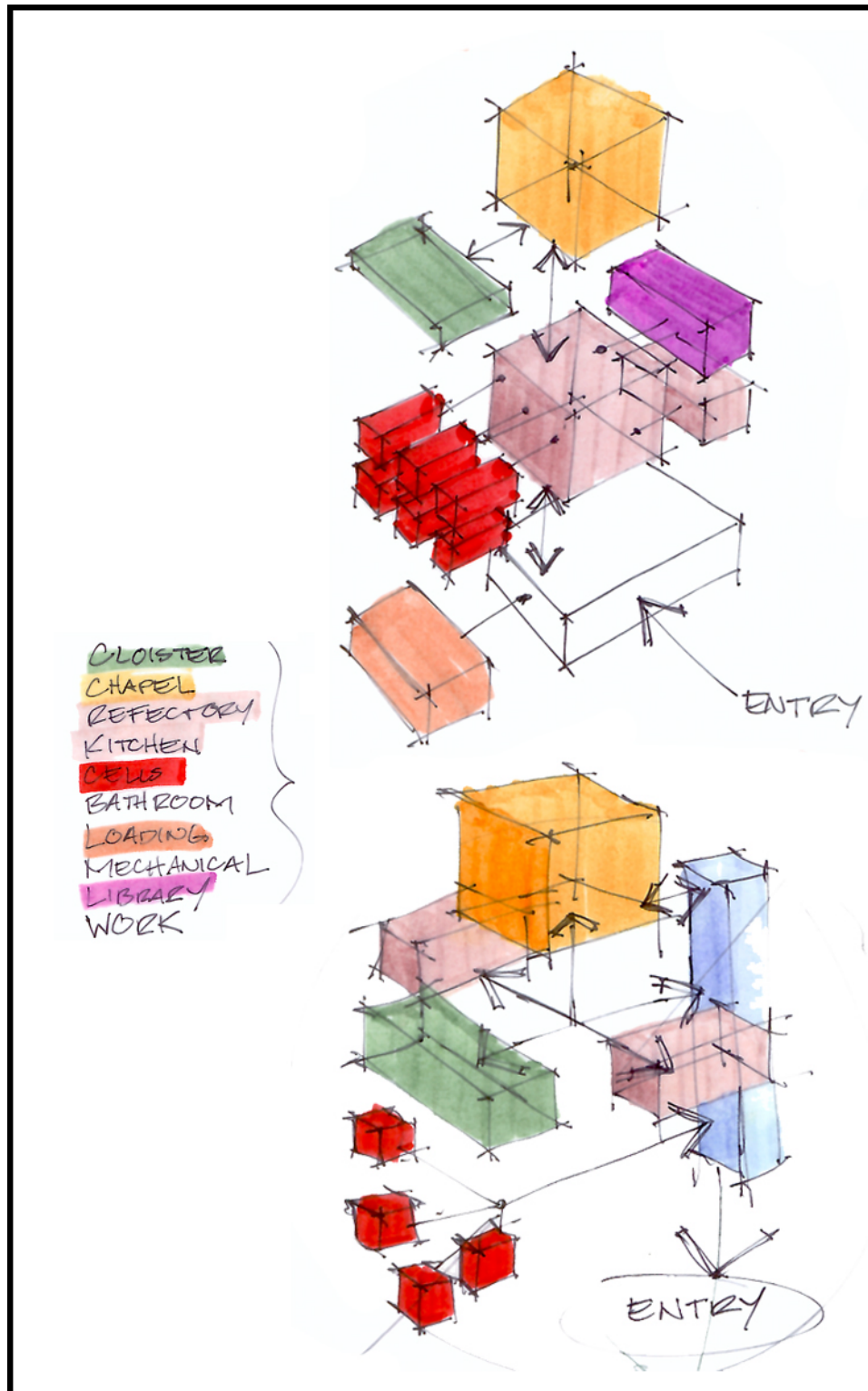


Figure 68: Programmatic analysis for site A: how to abstract the ideal in such a way as to fit into a tiny, vertical arrangement. [D. Lamp, 2007]

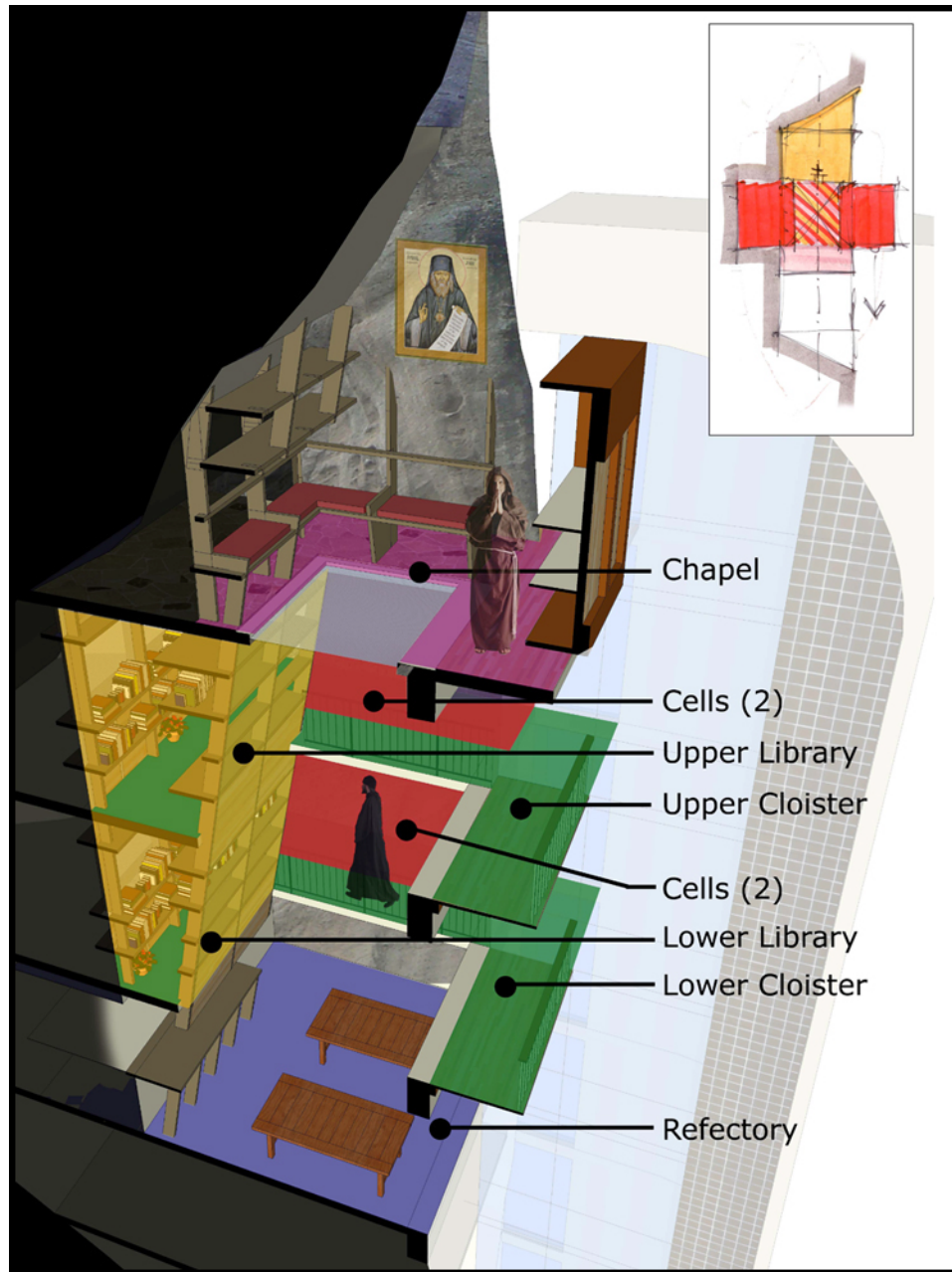


Figure 69: Diagram of the cloister arrangement for site A. The typical arrangement of chapel, open space or cloister, and then bounding wall is shifted into a vertical arrangement. The chapel occupies the highest point, the cloister becomes a shaft of space underneath, and the ancillary uses are pushed to the edges of the cave, around a central atrium. [D. Lamp, 2007]

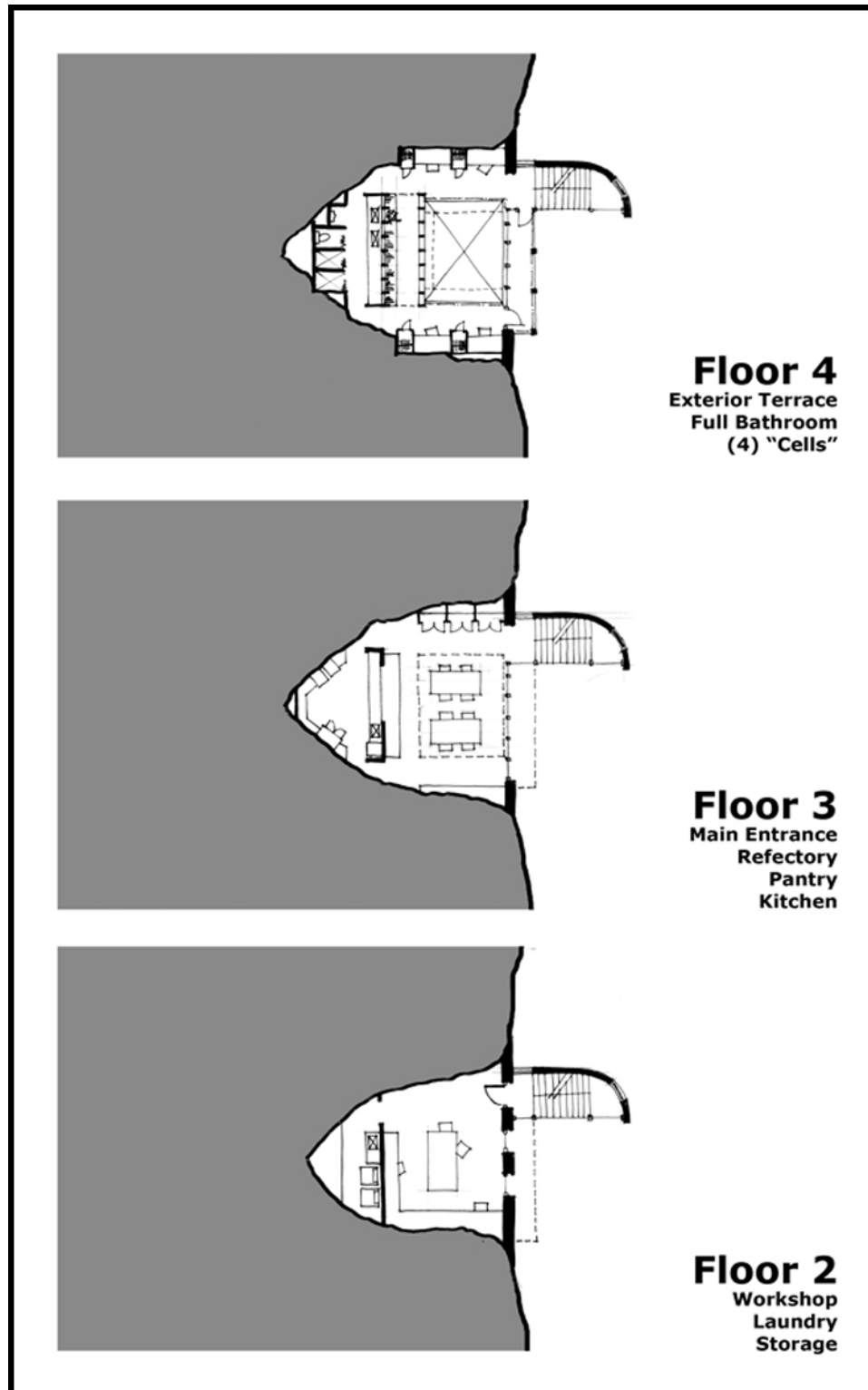


Figure 70: Partial set of floor plans for site A. (Floor 1, 5, and 6 are excluded.) [D. Lamp, 2007]

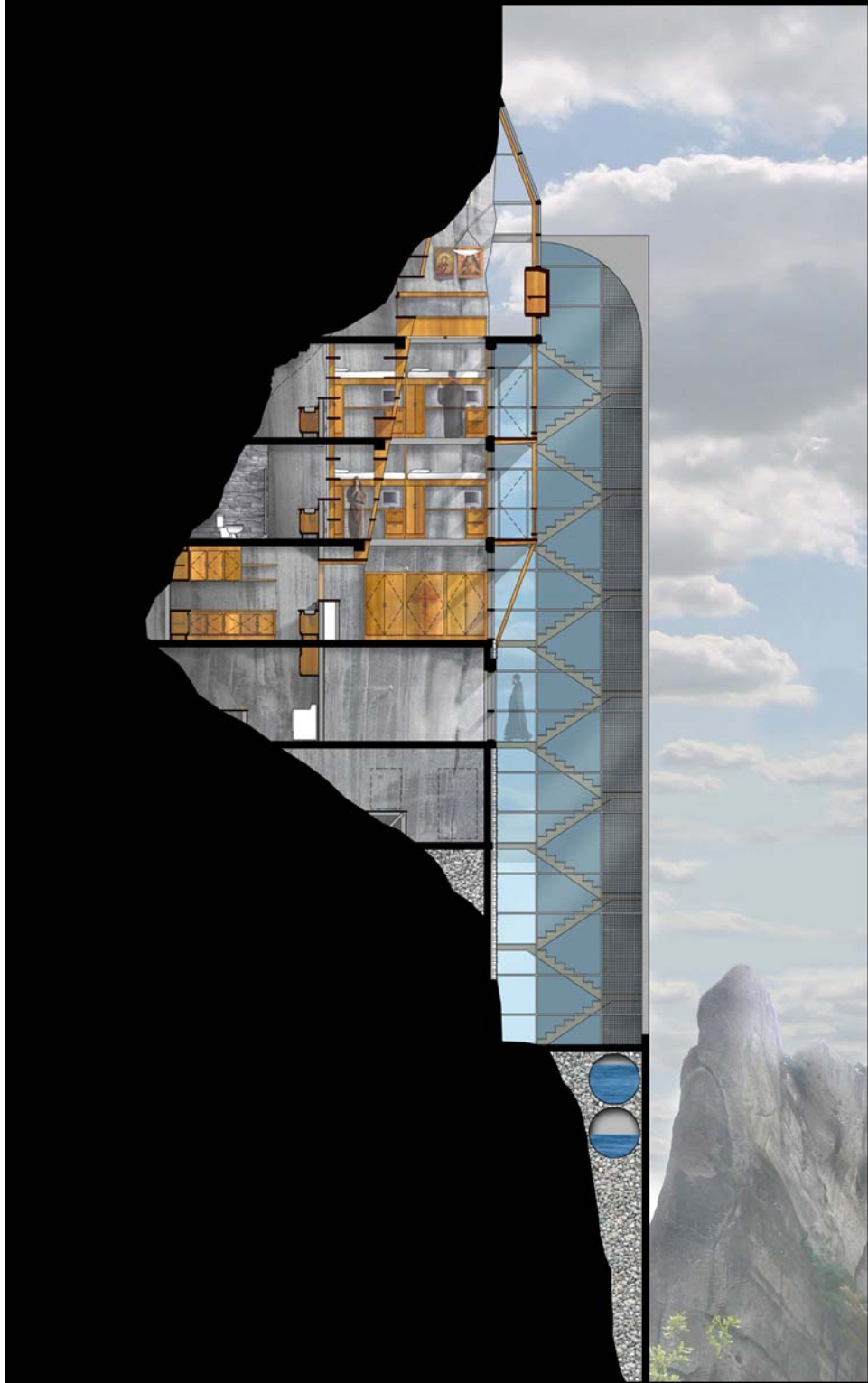


Figure 71: Rendered section through the vertical extreme at site A.

[D. Lamp, 2007]



Figure 72: Perspective of site A perched on the side of its cliff.

[D. Lamp, 2007]

BIBLIOGRAPHY

- Braunfels, Wolfgang. The Monasteries of Western Europe: the architecture of the orders. London; Thames and Hudson LTD, 1972.
- Curzon, George, M.P. "The Monasteries of the Meteora." The Illustrated English Magazine. Vol. 8, No. 91. London: April, 1891. Pp. 532-8.
- Dehejia, Vidya. Early Buddhist Rock Temples: a chronology. London; Thames and Hudson LTD, 1972.
- Goodell, Thomas Dwight. "A Journey into Thessaly." The Century Illustrated Magazine. Vol. LIV, No. 4, August 1897. New York City: Macmillan and Company. Pp. 501-4
- Hellier, Chris. Monasteries of Greece. New York City; Saint Martin's Press, 1996.
- Jolivet-Levy, Catherine. Etudes Cappadociennes. London; The Pindar Press, 2002.
- Kadas, Sotiris. Mount Athos: an illustrated guide to the monasteries and their history. Athens, Greece; Ekdotike Athenon S.A, 1984.
- Kostof, Spiro. Caves of God: the monastic environment of Byzantine Cappadocia. Cambridge, Massachusetts; MIT Press, 1972.
- Manoukian, Agopik and Manoukian, Armen, eds. Documents of Armenian Architecture: Gheghard. Venice, Italy; Edizioni Ares, 1973.
- Markham, A. H., Vice-Admiral. "Monasteries in the Air." Pearson's Magazine. [Volume and Issue illegible.] May, 1899.
- Mylonas, Paul M. Atlas of Athos: atlas of the twenty sovereign monasteries, topography and historical architecture. Berlin; German Archaeological Institute, 2000.
- Μητολκώοτα. Meteora, the Rocky Forest of Greece. 1984.
- Nicol, David Macgillivray. Meteora: the rock monasteries of Thessaly. 1963.
- Nimas, Theodoros A. Meteora, Kalambaka: a guide to their history and monuments. Deborah A. Whitehouse, Translator. Thessaloniki, Greece; Kyriakidis Brothers, 1988.
- Provatakis, Theocharis M. Meteora: history of the monasteries and monasticism. Athens, Greece; Toumbi's Editions, 1996.

Rodley, Lyn. Cave Monasteries of Byzantine Cappadocia. New York City; The Cambridge University Press, 1985.

Schwartz, Rolf D. Göreme. Dortmund, Germany; Harenberg Kommunikation, 1985.

Skouvaras, Vangelis. Meteora: An archeological and tourist guidebook. C.A. Ladogiannis, Translator. Athens, 1962.

Sofianos, D.Z. Meteora: itinerary. Thessalonica (Salonica), Greece; Melissa Publishing, 1991.

Thierry, Michel and Thierry, Nicole. Nouvelles Églises Rupestres de Cappadoce Région du Hasan Dağı: new rock-cut churches of cappadocia. Paris; Librairie C. Klincksieck, 1963.