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IDENTITY FEATURES OF ARCHAEOLOGICAL SITES IN THE DUBROVNIK HISTORIC AREA

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ABSTRACT

Identity features of 12 archaeological sites in the Dubrovnik historic area, which are the basis for their further evaluation, have been analysed. Seven research topics have helped identify the specificities of location, visual exposure in the city image, material and non-material determinants of a place, morphology of the urban tissue, various style characteristics and the condition of physical structure of a site. The conducted evaluation of the condition and the comparison of sites based on the same questions have indicated the level of features, as well as the contribution of each archaeological asset to the city as a whole. The three established groups of identity features provide a basis for a complete (visual, functional, structural) integration of sites into the Dubrovnik historical urban landscape.

Keywords: identity features, archaeological sites, urban morphology, historical urban landscape, Dubrovnik historic area

CARATTERISTICHE IDENTITARIE DEI SITI ARCHEOLOGICI NELL'AREA DI INTERESSE STORICO DI DUBROVNIK

SINTESI

Sono stati analizzati i caratteri identitari di dodici siti archeologici nell'area di interesse storico di Dubrovnik, punto di partenza per una loro ulteriore valutazione. Le particolarità della collocazione spaziale, la visibilità e la riconoscibilità nell'immaginario iconografico della città, le caratteristiche materiali e immateriali dei luoghi, la morfologia del tessuto urbano, i vari tratti stilistici e le condizioni fisico-strutturali dei siti sono stati individuati all'interno di sette temi di ricerca. La valutazione dello stato dei luoghi e il paragone tra loro rispetto a medesimi caratteri hanno permesso di definire la diversa importanza delle caratteristiche analizzate e il diverso contributo di ogni bene archeologico nella costruzione dell'immagine complessiva della città. Sono stati riconosciuti tre gruppi di caratteristiche identitarie, a partire dai quali si può progettare una completa integrazione dei siti (a livello visuale, funzionale e strutturale) all'interno del paesaggio storico urbano di Dubrovnik.

Parole chiave: caratteristiche identitarie, siti archeologici, area di interesse storico di Dubrovnik, paesaggio storico urbano di Dubrovnik

INTRODUCTION

Archaeological research during the restoration of Dubrovnik from the early 1980s until today has resulted in a number of new findings relevant to the cultural history of the city. Among numerous protection and research interventions, the contribution of archaeology has been confirmed not only at the level of individual sacral or profane architectural asset, but also in gradual revelation of several architectural complexes and key elements that outline the basic urban structure of the city. Dubrovnik's archaeological heritage, as a tangible remnant from the past, has other related benefits as well – it can entice cultural and educational dimension of society, it plays a key role in shaping the identity of smaller and larger communities, but at the same time it is a developmental resource for the enhancement of the city.

Unlike previous studies and research of archaeological heritage in the context of Dubrovnik's urban history, this paper explores identity features that can point to the basic features and constitutive relationship between archaeological sites and the city. The impact of these archaeological sites on the integrity of the Dubrovnik historic centre (under UNESCO protection) is analysed by considering the sites in relation to location, morphological features and size, in relation to their historical importance and the role in the urban tissue (historical role; contemporary interpretation/presentation). The aim of this paper is to examine possibilities of their structural, functional and visual integration into historical urban landscape.

Dubrovnik, a medieval planned city in the south of the east Adriatic coast, has preserved its character of a unique urban core surrounded by city walls. Its continuous and layered history is determined by geographical position, a combination of compatibilities (geomorphological features, sea and land routes) and other natural advantages that have enabled settlement of this area ever since prehistoric times and Antiquity (Marović, 1956; Basler, 1960; Batović, 1988; Žile, 1997; Ničetić, 2005). The earliest history of Dubrovnik, before the second half of 12th century when the first documents in the archive date back to (Foretić, 1980, 6),[1] still remains unclear, with various unknowns and real chronological issues, some of which were partly resolved by archaeological research in the 1980s. The Dubrovnik cathedral is the best example of how important these findings are and how archaeology can be crucial in resolving historical issues by indicating that Dubrovnik was

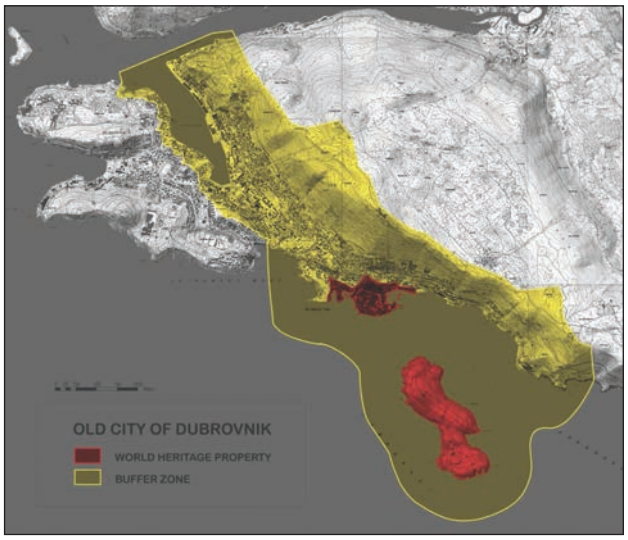

Figure 1: Old City of Dubrovnik, World heritage list (1979), area covered by the world heritage site (UNESCO, 2018).

founded much earlier than it was recorded in previous historiography.[2] Despite the results and their contribution to enlightening the genesis and earliest history of Dubrovnik, most archaeological sites have, for a number of years, remained decontextualised, isolated from their surroundings, without appropriate purpose and maintenance, in time becoming a pathological form in the urban tissue. The integrated approach to protection of archaeological sites has not been a part of scientific interest ever since the beginnings of systematic archaeological research (in the 1980s) to the present day.

The intention is to bridge the identified shortcomings by studying the identity features which will be the basis for defining all protection and management procedures and at the same time serve as a starting point for valorisation of immovable archaeological heritage.

MATERIAL AND METHOD

The scope of the Dubrovnik historic area, which is the subject of this research (Figure 1), coincides with the boundaries of the world heritage site (under UNESCO protection) and covers an area of 96.7 ha, with the Old City of Dubrovnik taking up 24.7 ha and the island of Lokrum 72 ha (Old City of Dubrovnik, 2023).

Implementational Town Plan for the Historic Centre of the City of Dubrovnik (1986) is the basic document

1 The first documents in the Dubrovnik archive date back to 1022, but the documents have been kept in the archive as a separate body only since the second half of 12th century.

2 Historiography has mostly relied on the work of Byzantine emperor Constantine Porphyrogenitus *De administrando imperio* (middle of 10th century) which describes gradual development of Dubrovnik in the early Middle Ages.

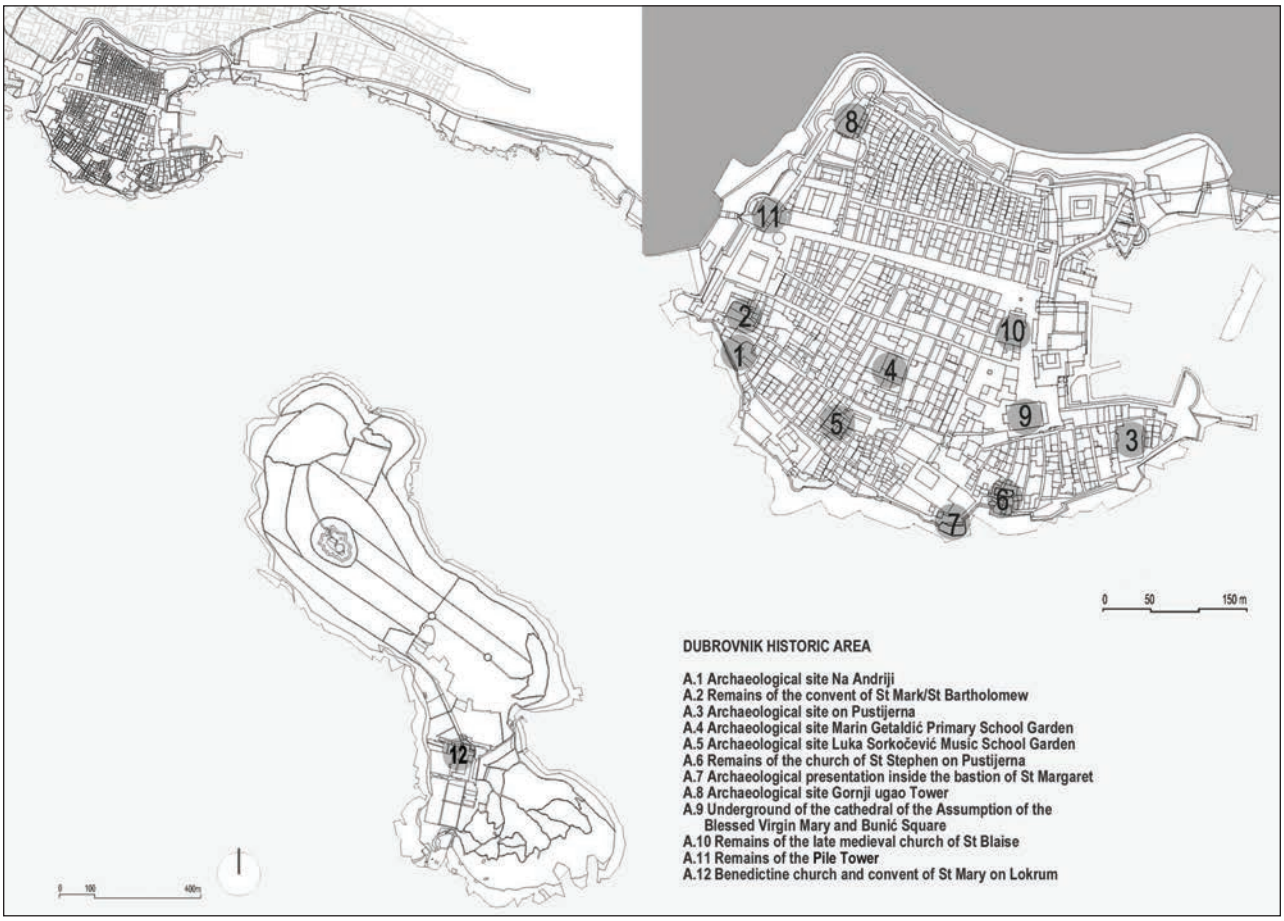

Figure 2: Position of archaeological sites in the Dubrovnik historic area. Old City of Dubrovnik and the island of Lokrum (Author: Zehra Laznibat). The list of sites:
A.1 Archaeological site Na Andriji
A.2 Remains of the convent of St Mark/St Bartholomew
A.3 Archaeological site on Pustijerna
A.4 Archaeological site Marin Getaldić Primary School Garden
A.5 Archaeological site Luka Sorkočević Music School Garden
A.6 Remains of the church of St Stephen on Pustijerna
A.7 Archaeological presentation inside the bastion of St Margaret
A.8 Archaeological site Gornji ugao Tower
A.9 Underground of the cathedral of the Assumption of the Blessed Virgin Mary and Bunić Square
A.10 Remains of the late medieval church of St Blaise
A.11 Remains of the Pile Tower
A.12 Benedictine church and convent of St Mary on Lokrum

that has set out the conditions for long-term restoration and revitalisation of that unique urban area following the 1979 earthquake. The plan has prescribed small or large-scale research and protection works in all restoration projects and especially in the interventions to rehabilitate certain city quarters. In the review of the conducted research, the sites related to important city buildings stand out as especially interesting, as well as the ones next to the areas that have not been rebuilt after the 1667 earthquake. The 12 archaeological sites that are the subject of this research, ranging from an individual finding inside a building to the scope of an archaeological area, can present key issues in terms of protection and improvement of the condition of the immovable archaeological heritage.

The research studies identity features of the Dubrovnik archaeological sites that are important for the alignment with contemporary protection and management approaches. The outcome of this research should serve as the basis for valorisation

Figure 3: Remains of the church of St Stephen on Pustijerna, A.6 (Photo: Antun Baće).

Figure 4: Underground of the cathedral of the Assumption of the Blessed Virgin Mary, A.9. Central nave of the three-naved basilica, view of the apse (Photo: Marta Perkić).

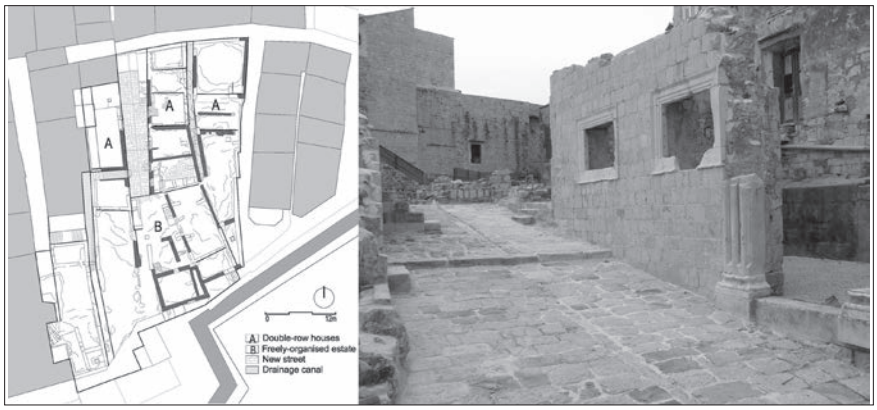

Figure 5: Archaeological site on Pustijerna, A.3. Architectural recording of the current condition (Author: Nađa Nađ, Dubrovnik; interpretation: Zehra Laznibat). Architectural detail (Photo: ZOD).

Figure 6: Archaeological site Marin Getaldić Primary School Garden (Photo: Zehra Laznibat).

Figure 7: Archaeological area Na Andriji, A.1, A1.2 (Archaeological sites of St Andrew and St Mark convents) Architectural survey of present condition, plan (Laznibat & Obad Ščitaroci, 2018).

Figure 8: Gornji ugao Tower archaeological site, A.8 Museum presentation of the archaeological site, the metal foundry complex (Source: KOD, photo: Miljenko Mojaš; photo: Marta Perkić).

of immovable archaeological heritage, but also as a starting point for visual, structural and functional integration of the sites into historical urban landscape.

An overview of important results of previous archaeological research necessary for the contextualisation of the sites within the Dubrovnik historic area is also presented.

Archaeological sites in the Dubrovnik historic area

The questions of foundation of Dubrovnik, first settlements and the image of the early medieval city have not been entirely clarified yet. New archaeological and other research that will be conducted during construction works as prescribed by law should offer the answers to these questions.[3]

3 Three basic theories with respect to this topic have been shaped over time. The first theory had appeared much earlier than the 1979 earthquake and it places the foundation of Dubrovnik into the 7th century on the island of Lave, at the location of the mediaeval convent of St Mary of the Castle. The second theory was created in the 1980s, and according to this theory the first settlement was founded on the peninsula (not the island) by settling the existing Byzantine castrum from the first half of 6th century, on whose location the convent of St Mary of the Castle was later built (Rapanić, 1988; Rapanić, 1989; Peković, 1997; Peković, 1998). The third theory confirms the continuity of settlement in Dubrovnik since prehistoric times and Antiquity and it is based on numerous archaeological findings as well as on the pre-conditioning of the sailing station in that part of the eastern Adriatic coast (Ničetić, 2005; Žile, 1997).

Table 1: Basic data from previous archaeological research.

designation	short description/ identification of the archaeological site	
A.1 Archaeological site Na Andriji	The area called Na Andriji (Figure 7) in the southwest of the city is the largest archaeological site inside the city walls. Archaeological research on this site has unearthed the remains of Benedictine convents of St Andrew and St Mark (the latter was originally dedicated to St Bartholomew) (Žile, 1996).[4] The place of their foundation is located outside of the old fortified part of the settlement, within one of the first medieval suburbs formed in 11th/12th century. Spatial organisation of the explored archaeological area is determined by the central street of east-west direction, continuing on the route of what is today Strossmayerova Street and Od Rupa Street which was also the border between the monastic complexes. The convent of St Andrew was organised along the city walls towards the sea, north of the assumed position of the church of the same name and around a small courtyard with a cistern,[5] while the initial core of the convent of St Bartholomew, in the northwest part of the site, is determined by an architectural structure pointing to the finding of a pre-Romanesque church. Archaeological research along the course of the drainage canal next to the church of St Mark[6] has provided new insights into the sequence of building stages and the disposition of that monastic complex. This archaeological research has contributed significantly to the urban topography of Dubrovnik - it has resulted in new knowledge of the vanished sacral buildings (the church of St Bartholomew, the church of St Martin and the chapel of St Martin) and the communal granary as well as the streets negated in the urban tissue (Laznibat & Obad Šćitaroci, 2018, 65).	13–17 cent.
A.2 Remains of the convent of St Mark/ St Bartholomew		13–17 cent.
A.3 Archaeological site on Pustijerna	The area called Pustijerna (Figure 5) is especially interesting in the organisation of the city because it has kept the urban tissue pattern from before the regulation set out in the 1272 City Statute, and it is outlined by the direction of the main streets that make up regular building insulae (blocks) (Grujić, 1986, 17).[7] Archaeological research on Pustijerna has revealed the remains of mediaeval housing blocks with a paved street between them.[18] The blocks on both sides of the street show a design scheme consisting of double house rows with a drainage canal in the middle, as opposed to the freely-organised estate in the southern part of the site. Morphological transformation of the mediaeval tissue, from the basic module of a square plot (determined by wooden construction) to the later aggregation into more complex building systems, can be traced in the western block. Following the 1667 earthquake and the demolition of mediaeval and Renaissance houses, that part of Pustijerna was buried up to the first floor level and arranged as a garden. The organization of the garden was recorded in an Austrian cadastral map of Dubrovnik from 1837.	13–17 cent.

4 Archaeological research (1989–1991), led by Ivica Žile.

5 Although archaeological remains of the church of St Andrew were not found, archival sources and indirect indicators testify of its position next to the very city walls (Laznibat & Obad Šćitaroci, 2018, 58).

6 Archaeological research during the restoration of the stone mixed drainage canal (2015–2016), ARHEO PLAN d.o.o. Dubravka, led by Maris Kristović.

7 The regular grid of streets (Od Pustijerne Street and shorter, vertical streets) corresponds to the orientation of the Romanesque cathedral and the previous early mediaeval basilica, as well as with the earliest core of the Rector's Palace associated with the Castrum mentioned in the 1272 Statute.

8 Archaeological research (1984–1987), led by Željko Rapanić.

A.4 Archaeological site Marin Getaldić Primary School Garden	The example of Marin Getaldić Primary School Garden archaeological site[9] (Figure 6) shows an older type of spatial organisation of a rectangular housing block (Planić Lončarić, 1980) whose outline was shaped by the streets mentioned in the City Statute (Peković & Babić, 2016).[10] Its complex stratigraphy can be read in the predetermined internal organisation (building plots next to dead-end access lanes) and in relation to the regulation of double rows of houses (1296) in the northern part of that rectangular block. The two typological patterns had marked the changes in the sequence of building stages of this, largest, in size, rectangular block in the city centre until the 1667 earthquake, when its central/northern part along Gučetićeva Street was not restored due to the damage it suffered, but was rather converted into the garden of the nearby 18th century palace.	13–17 cent.
A.5 Archaeological site Luka Sorkočević Music School Garden	The garden of Luka Sorkočević Music School is one of the least researched sites within the city walls. It is the area of the former Benedictine convent of St Simon, known as the oldest Dubrovnik convent confirmed by sources (1108) (Ostojić, 2010, 171). It was located in the southern, older part of the city, within the area that, based on the mediaeval division, comprised the sexterium of St Peter. The early mediaeval church of St Peter (which gave its name to the area) was located in the immediate vicinity of the convent. The convent of St Simon stretched between two longitudinal historical communications, today's Od Kaštela and Strossmayerova streets. Its land, visible today within the perimeter walls from the beginning of the 16th century, did not border either of these streets. Due to terrain configuration, the complex was elevated high in relation to Strossmayerova street, but it is possible it could have been accessed from that street.	12–17 cent.
A.6 Remains of the church of St Stephen on Pustijerna	Archaeological research of the remains of the church of St Stephen on Pustijerna is connected to the beginnings of archaeological work in the Dubrovnik area. The foundations of the older church of St Stephen were found within the remains of a Romanesque-Gothic church. Based on scarce information, it was assumed that the church is a small single-nave building with a rectangular apse. Additional revision research has established the final form of the apse[11] as well as a significantly larger scale of the older (according to researchers) early mediaeval church (Peković, 2012, 35). A large amount of pre-Romanesque sculptures, various parts of liturgical installations and architectural decorations were found and dated back to 8th or the beginning of 9th century (Peković, 2012, 21). (Figure 3)	9–14 cent.
A.7 Archaeological presentation inside the bastion of St Margaret	The bastion in the central part of the southern city walls was named after the church of St Margaret, whose location it was built on in 1570 (Beritić, 1989, 158). Three stages in the development of the fortification system were identified in the archaeological research[12] conducted within the bastion: period up to 1426 – remains of an early mediaeval wall with a NW-SE direction, building structures preceding the construction of the southern city wall; period 1426–1570 – remains of the southern city wall and the square tower; period after 1570 – construction of the bastion of St Margaret.	9–17 cent.

9 Archaeological research in the Marin Getaldić Primary School Garden (1986–1987), led by Romana Menalo.

10 The northern border of the block overlapped with the position of the old fortifications along the northern edge of what is today Strossmayerova Street, while other bordering streets were regulated by the provisions of the 1272 and 1296 Statutes (present-day streets: Gučetićeva, Pracatova and Božidarevićeva).

11 Archaeological research (1997–1998), led by Ivica Žile; archaeological research (2011–2012), Omega engineering d.o.o. Dubrovnik, led by Nikolina Topić.

12 Archaeological research (2014–2016), ARHEO PLAN d.o.o. Dubravka, led by Maris Kristović.

A.8 Archaeological site Gornji ugao Tower	The overview of the archaeological site Gornji ugao in Dubrovnik concerns the discovery of an early modern age metal foundry under Minčeta, built on the area of a former tenaille (a specific defence element in the northwest corner of the mediaeval fortification). The production process of the metal foundry was determined by the archaeological research and divided into five mutually complementing spatial and functional units (Milošević et al., 2008, 684-689).[13] Gornji ugao archaeological site depicts the process from an archaeological source to archaeological heritage, where the application of appropriate methods has led to its successful protection and efficient management decisions (Figure 8).	14–17 cent.
A.9 Underground of the cathedral of the Assumption of the Blessed Virgin Mary and Bunić Square	The most important archaeological research is definitely the one conducted under the Dubrovnik cathedral of the Assumption of the Blessed Virgin Mary and under Bunić Square.[14] Apart from the expected findings (the Romanesque cathedral and its Gothic belltower-baptistery), the research has also unearthed the remains of a Late Antiquity castle, the early mediaeval three-naved basilica and the tetraconch memorial chapel as well as various types of tombs, numerous pieces of stone sculptures and frescoes, numismatic findings and other movable cultural material (Stošić, 1988; Mirnik, 1997; Žile, 1999).[15] The research on Bunić Square has revealed the oldest architectural structure on the site – a Late Antiquity defensive wall approximately thirty metres long dated back to 5th/6th century based on the manner of construction, depth of foundations and correlation with other findings (with some modifications in the pre-Romanesque period). The significant discovery of the early mediaeval three-naved basilica has attracted a lot of interest by numerous experts and opened up many questions, some of which still remain unanswered (Figure 4 & 13).	5/6–15 cent.
A.10 Remains of the late medieval church of St Blaise	Archaeological research along the southern part of (today's) Baroque church of St Blaise revealed the outer outline of the former late mediaeval church, on its western, southern and eastern side.[16] It was a three-naved, three-apse building which was built, based on the decision of the Great Council from 1348, on the communal square of that time (Marinković, 2017, 65). The remains of pilasters (0.5 m deep) were found on the southern and western perimeter of the discovered building, while the back of the church was shaped in three apses, with the middle one larger and more prominent than the lateral ones. Morphological features of the front side of the church (finely shaped three rows of cuboids with narrow joints) show Romanesque patterns (Žile, 2008). Archaeological presentation was not possible so the site was buried once again.	14 cent.
A.11 Remains of the Pile Tower	The Pile Tower had its historical function within the western defence system of the Pile Gates in Dubrovnik. It is related to the rectangular towers along the western city wall (towers: St Francis, Gornji Ugao and Minčeta), dated back to 1319, just like the city wall itself (Peković & Babić, 2018, 221). After the damage it suffered in the earthquake (1667), the Pile Tower has never been restored any more, at the time of Austrian rule in Dubrovnik its western part was demolished and the rest, within the city wall, was transformed into an ammunition storage. Today it is parterre presented in situ on the pavement.[17] The revision archaeological research conducted on the serpentine between the Pile Gates[18] confirmed the square shape of the tower (west of the city wall), defined the remains of the rampart (1351) and the position of the Outer Pile Gate in the axis of the Inner Pile Gate.	14–16 cent.

13 Archaeological research (2007–2008) - Omega engineering d.o.o., led by Branka Milošević.
14 Archaeological research (1981–1987), led by Josip Stošić, with Ivica Žile and Ivan Tenšek as participants.
15 The findings of Illyric and Hellenist money are the oldest material remains found within the Dubrovnik historic centre.
16 Archaeological research 2006, led by Ivica Žile.
17 Archaeological research /infrastructural works (1969), led by Dubravka Beritić.
18 Archaeological research 2008, led by Ivica Žile.

A.12 Benedictine church and convent of St Mary on Lokrum	The research-conservation campaigns[19] in the area of the Benedictine convent of St Mary on the island of Lokrum revealed the remains of architecture that was created in succession in that area from 11th to 16th century. It was the first Benedictine convent in the Dubrovnik area (1023) although the church of the Lokrum Benedictines from the 11th century was not discovered; only several pre-Romanesque fragments attributed to it were discovered (Fisković, 1963, 48). The remains of the church of St Mary from the 12th century (Figure 10), the three-naved, three-apse building in perimeter, show a typological relation to Romanesque east Adriatic Benedictine churches (Jurković, 1996, 330). At the time it was built, the church probably had an antechamber as well, but today's condition reflects the complete transformation it underwent in the second half of 15th century. During the 15th and 16th century, two lateral chapels were added to the church on the north side, partly preserved in the level of perimeter walls. Ruins of a Romanesque convent, its west and east wing that formed an older convent cloister together with the church, were identified south of the church. The church was demolished in the (1667) earthquake, as well as the Romanesque convent and the part of the convent that was built in 15th century, after the Lokrum abbey was joined with the Congregation of St Justina in Padua (Ostojić, 2010, 124). The project of the archduke Maximillian of Habsburg's residence (middle of 19th century), in the southern part of the east wing of the convent, included a landscape arrangement of the surrounding area with the stylization of the ruins of the Benedictine church.	11–16 cent.

Archaeological findings underneath the Dubrovnik cathedral and Bunić Square (Stošić, 1988; Žile, 1999) as well as the results of underwater archaeological research in the city port (Ničetić, 2005, 60), corroborated by a number of other archaeological findings, have imposed new perspectives on the founding of Dubrovnik and the thesis about the existence of the settlement before the city that co-existed with the Epidaurus from the Illyric period (Žile, 1997, 113). Not going into detail about any of the theories of the foundation and development of Dubrovnik, what follows is a short overview of archaeological sites relevant for the genesis of the city, as well as for outlining the key components of its urban structure.

Apart from the (main) archaeological research at the site of the Dubrovnik cathedral, extensive campaigns in the 1980s revealed the existence of *insulae*, entire building blocks of profane architecture (housing blocks on Pustijerna, A.3; Marin Getaldić Primary School Garden, A.4) and presented the organisation and impact of sacral complexes on the structure of urban tissue (the area of St Andrew and St Mark convents, A.1, A.2). The sites that offer an insight into the socio-economic aspect of Dubrovnik are equally interesting, such as the metal foundry under Minčeta (A.8), communal granary and the city infrastructure in the 15th century (A.1, A.2) (Figure 2).

This short overview of the results of important archaeological research has offered an insight into the dynamic of changes in the urban tissue which, initiated by social developments and cultural-historical processes, should provide a contextual framework for each site at present and in the future.

Theoretical framework and research method

The paper emphasizes the importance of cognitive aspects of archaeological sites and their contextualization within the Dubrovnik historic area, which presupposes a number of theoretical concepts and analytical tools. Unlike the usual fragmentation of knowledge, separate specialist observations, the focus of this research is a comprehensive framework for studying and synthesizing a multitude of data from various viewpoints. Such an approach, in return, provides a basis for identifying not only those components that present the principal properties of the discovered remains of material culture, but also directly links those properties with certain values, thus directing all further processes of protection and conservation of archaeological heritage.

The method of valorisation of archaeological sites will be the subject of a separate research and the identity features of the Dubrovnik sites will be one of its starting points.

19 Archaeological research (2000–2009), led by Ivica Žile; the church and the Romanesque convent (2011) ARHEO PLAN d.o.o. Dubravka, led by Nela Kovačević Bokarica; in front of the church antechamber, within the west wing of the Romanesque convent (2015–2017) Arhita d.o.o. Dubrovnik, ARHEO PLAN d.o.o. Dubravka, led by Zvjezdana Tolja, Nela Kovačević Bokarica.

The *Heritage Urbanism*[20] scientific project provides the methodological framework for the research of identity features of both cultural and archaeological heritage. Apart from complementing the methods in spatial and urban planning, the suggested approach can also be applied to the protection and preservation of archaeological heritage (Obad Šćitaroci & Bojanić Obad Šćitaroci, 2019a; 2019.b).

The research presented in this paper uses different conceptions within urban morphology in order to identify and describe archaeological sites inside the city. The approaches stemming from the works of German geographer M.R. Conzen (Conzen, 1960) and Italian architects and theoreticians G. Caniggia/ G. L. Maffei (Caniggia & Maffei, 2017) are applied both directly and indirectly. Based on the synthesis of these two approaches, Karl Kropf has developed a conception that considers the built environment as an organic whole (Conzen's *plan unit*; Caniggia's concept of *urban tissue*) whose form can be described in a hierarchical relationship, at different levels of *resolution* of its main components (Kropf, 1996, 251). Based on that, the stratified structure of an archaeological finding/site can be precisely described at all levels of detailedness (in relation to the position, form and layout), which is especially appropriate for urban research of different scales since both an individual archaeological site and the city's built structure, its comprehensive plan with clear constitutive principles of the whole, are analysed at the same time.

The condition for integrity of historical urban landscape, according to Jokhileto, should be understood in the relevant historical context and it refers to: 1) socio-functional; 2) historical-structural; and 3) visual-aesthetical aspects of a place (Jokilehto, 2006, 14; Jokilehto, 2007, 32; Jokilehto, 2010, 47-50).

The technique of *Space Syntax analysis* is used for the research of spatial and visual integration of archaeological sites into the contemporary surroundings (Van Nes & Yamu, 2021). By taking into consideration the connection between public space (the urban street network), the approach enables conclusions about integration or accessibility of certain archaeological sites in the historic urban core of Dubrovnik.

The paper examines 12 archaeological sites in the Dubrovnik historic area. Their choice is primarily based on the estimate of historical, visual, functional and other types of connections between each archaeological site and its surroundings. The initial research was conducted based on relevant scientific literature, professional studies, collected archival, cartographic and visual materials and field research.

The recognised identity features of archaeological sites are the result of the inductive-deductive research method, based on theoretical assumptions and empirical research (in the catalogue made for the research: historical, morphological research, spatial and visual accessibility etc.).[21] The procedure of identifying the unique urban properties of a site began by researching the conditions of natural location, visual perception of a place, various prerequisites in the organization of the physical structure and the historical development of urban tissue (whose component is the site itself), as well as all the other material and non-material meanings within the context they belong to. In order to determine what is specific for a certain place, period, style or typological pattern of realisation, an evaluation of the condition of the sites and their comparison based on the same questions was then conducted, which enables to determine the quality of features, as well as the contribution of each archaeological finding to the city as a whole.

Nevertheless, it was necessary to observe a great range of components of archaeological sites and the stratification of the relations inside the city in the context of visual, socio-functional and structural-historical integrity according to the following plan:

1. Visual integrity: The features of archaeological sites were analysed in relation to the location, geomorphological features and size; their visual quality and exposure in the city image (micro-macro level) were considered based on how preserved their physical structure is, in the way that legibility is translated into visibility and picturesqueness as important properties of a given city area.
2. Socio-functional integrity: It is based on identifying the functions and processes that were the basis for the development of a certain place in the past, during its use, lifetime and discontinuation (*non-living* socio-cultural systems within the scope of archaeology). The stages after the archaeological finding, during the research and during the contemporary protection and management of that archaeological site are equally involved. A configurational analysis of spatial accessibility was done in relation to the connectivity of public space, where street networks can indicate the intensity of socio-economic activity in the city.
3. Structural-historical integrity: The pattern of basic components of the tissue which the archaeological site belongs to (street patterns, land subdivision, building forms) was analysed, as well as changes in the density of land distribution and various restrictions with regard to ownership, purpose or private-public use of space.

20 *Heritage Urbanism* – Urban and Spatial Planning Models for Revival and Enhancement of Cultural Heritage (2014–2018), Faculty of Architecture, University of Zagreb.

21 The catalogue of archaeological sites in the Dubrovnik historic area is a part of doctoral research titled *Integrated Protection Models of Archaeological Heritage in Dubrovnik's Historic Area*, completed in the Faculty of Architecture, University of Zagreb (Laznibat, 2021a, 2021b).

The aim of the research is to establish a consistent approach to the argumentation of integrating factors (identity features) of archaeological sites in the Dubrovnik historic area, which represents a starting point for further valorisation and provides a basis for defining the protection and management measures.

RESEARCH RESULTS – IDENTITY FEATURES

The holistic and interdisciplinary approach of the research is summarised into seven basic questions for determining the identity features: 1) the character of location; 2) visual exposure in the city image; 3) spirit of place *(genius loci)*; 4) urban tissue features; 5) streets and accessibility; 6) style features; and 7) material.

Based on the analysis and comparison of the sites with regard to the same questions, the determining factors for the evaluation of key components that should express the uniqueness and authenticity of heritage are presented in a table.

With the focus on visual, functional and structural integration of archaeological sites, three groups of identity features (Table 9) have been identified whose distribution, as well as mutually overlapping relation, is defined according to the shared criteria:

1. visual features: the character of location, physical and visual quality of the site inside the city;
2. socio-functional features: processes related to the development and the character of place, spatial accessibility in the contemporary surroundings;
3. historical-structural features: physical preservation, historical-morphological features of urban tissue.

This division enables the consideration of value features that will be the basis for defining the approach to valorisation of archaeological heritage.

The character of location

The uniqueness and predetermination of building and design features of archaeological sites is considered based on their location in the Dubrovnik historic area (Figure 2). The basis of the research is the mediaeval planned city inside the city walls, outlined by statutory provisions from the 13th century and later modifications, while the process of urban design itself was completed by the end of 14th and the beginning of 15th century (Beritić, 1958, 18-21). Due to these rational decisions, based on the postulates of regularity and relatively uniform land subdivision, Dubrovnik has essentially kept its features of a mediaeval city despite numerous transformations.

Based on the research of the Dubrovnik archaeological sites, identity features that indicate the character of location have been determined and they include: the size of the archaeological site; geomorphological features; and the position at the city level.

Size: When planning appropriate protection and management measures, the distinction should be made between urban and architectural scale (threshold being 900 m^2)[22] proportional to the size of the archaeological site. Seven archaeological sites have been singled out, large enough for morphological-physiognomic readability and the experience of a specific spatial (functional) unit inside the city. It is clear that the urbanism approach implies integration of smaller archaeological sites as well, especially when it comes to their systematisation based on particular professional questions and conservation methods.

Geomorphological features: The impact of geomorphology was considered with regard to orographic conditions, slope aspect, in relation to the orientation and direction of the relief forms, which is reflected in the vistas and visibility of archaeological sites. When considered from that aspect, visibility of a certain area in the city primarily depends on the configuration and on the height above mean sea level of the position itself. Taking this into account, the sites on the southern slope of the ridge belt of Kaštel and Pustijerna, with northern orientation (four archaeological sites), have a bigger visual impact on forming the image of the city than the ones on the central plain between the two main longitudinal street routes. In terms of visibility, geomorphological features are not relevant for the sites in closed space or the underground museum floor (A.7, A.8, A.9, A.10).

Position: The possibility of urban integration and public accessibility of archaeological sites was considered in relation to their position (city centre/public space; periphery inside the city walls/ island of Lokrum). Only five archaeological sites are located in the city centre/public space, one is on the island of Lokrum (Benedictine church and the convent of St. Mary, A.12), while the rest of the sites are on the periphery inside the city walls. This analysis confirms the importance of the sites in the city centre, where the social context and the way in which they are connected in the concepts of identity, spirit and sense of place[23] achieves new non-material contributions both at present and in the future. The concept of *fringe belt* (Whitehand, 2001, 106*)*,[24] has been identified in certain sites (archaeological area Na Andriji, A.1, A.2; Gornji ugao Tower, A.8), which is in a way the result of sequences of building on the urban

22 Medium scale of all 12 sites corresponds to the average area of the double house rows in the southern part of the Dubrovnik historic centre.

23 Archaeological heritage in the underground of the Dubrovnik cathedral and Bunić Square (A.9), in correlation with the earliest history of Dubrovnik, is of key importance in creating social identity, and it is complemented by the finding of the late mediaeval church of St Blaise (A.10), dedicated to the main patron saint of the city.

24 It refers to peripheral areas of the city, different based on the pattern of foundation – morphological framework in the sense of land subdivision, density of land distribution or purpose, acts as a long-term limitation to the unification of urban tissue.

Table 2: Identity features in relation to the character of location.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Size (m^2)	1022 +	1068 +	1600 +	950 +	900 +	147	260	513	1200 +	430	450	2285 +
Geomorphological features	+	+			+	+	X	X	X	X		
Position				+		+			+	+	+	

1. Size
+ (7) 58% area > 900 m2
(5) 42% area < 900 m2

2. Geomorphological features
+ (4) 50% on sloping terrain
(4) 50/% on flat terrain
X (4) not relevant

3. Position
+ (5) 42% central part of the city
(7) 58% periphery/ island of Lokrum

Table 3: Identity features in relation to the visual exposure of archaeological sites in the city image.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Identity/ recognisability	9 +	9 +	8 +	9	9 +	9	X	X	X	X	4	+
Visual integration	+	+	+		+		X	X	X	X		+

4. Identity/recognisability of the contrasting image
+ (5) 63% high level (number of observation points/ peripheral position, urban void)
(3) 37% low level (number of observation points / city centre/public space)
X (4) not relevant

5. Visual integration into the city image/level of impact
+ (5) 63% high level (sloping terrain, urban void, peripheral position)
(3) 37% low level (flat terrain, building, city centre)
X (4) not relevant

periphery (the pattern of land subdivision, lack of streets, closedness of sacral complexes, industrial zone). Those archaeological sites may promote the development and vitality in the peripheral areas of the city, especially if public facilities with archaeological presentation will be planned there.

Visual exposure in the city image

One of the starting points of this research is the hypothesis that the visual image of Dubrovnik is the city's key identity feature which is the basis for all the changes in urban tissue. The historic centre of Dubrovnik, together with the island of Lokrum and its immediate surroundings as a panoramic framework of that unique image, is experienced in a number of sequences, from access roads and well-kept viewpoints, city streets in the area of Konali and Ploče, from the Srđ plateau, distant views from the sea or from the air, but it is equally present in the image of the city area in the memory.

With regard to general visibility and visual contribution of archaeological sites to the city image, the following identity features are presented: identity/ recognisability of the contrasting image; and structural and visual integration.

Identity/recognisability of the contrasting image: The historic centre of Dubrovnik was considered from a distance, so that the picturesqueness and identity of the whole can be analysed in relation to those qualities of archaeological sites that can evoke a powerful experience in the mind of each individual (Lynch, 1960, 9). Previously mentioned identity features also affect visual exposure of the sites in a positive way, where the legibility of the contrasting image is analysed based on orientation, size of the void in urban tissue and colour and form of the sites in vistas. Their proportion in the city image was empirically studied by using a visibility map, observed from a larger distance, from the busiest, elevated positions (D8 state road) (Figure 9). Four potentially (visually) exposed sites inside the historic centre of

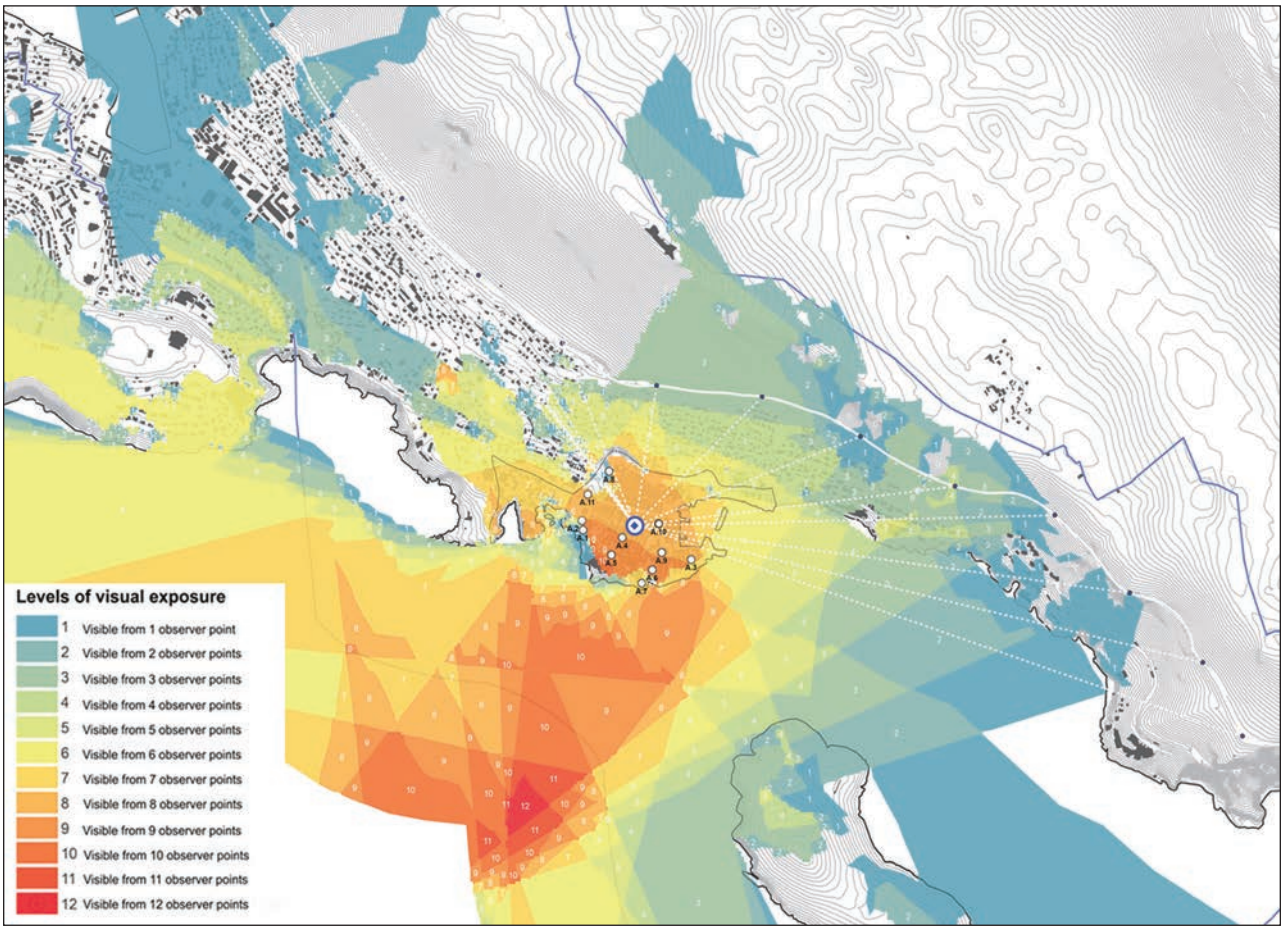

Figure 9: Dubrovnik historic centre, viewshed analysis from selected observation points along the Adriatic Highway. Levels of visibility in relation to the number of observation points (Kantafig – Orsula viewpoint) (Author: Aljoša Špaleta).

Dubrovnik (A.1, A.2, A.3 and A.5)[25] have been singled out by overlapping the results of visual coverage of the city with the conditions of location. This is especially true for the archaeological area Na Andriji (A.1; A.2) which represents a highly-exposed area, but the effect of its peripheral position next to the low city walls towards the sea needs to be taken into account as well. The remains of once dense residential building have been preserved on another archaeological area, on Pustijerna (A.3), but today this is a great urban *void* with a clear outline (bounded by high city walls and the contour of housing blocks). Despite the spatial domination, that part of Pustijerna has a somewhat lower impact in Dubrovnik's panoramic vistas due to being relatively concealed in the city formation. The archaeological site on Lokrum (A.12) was observed from the pedestrian vista while its visual recognisability within cultural landscape was substantiated with a number of historical photographs and pictorial representations.

Visually exposed archaeological sites contribute to the recognisability of the city's panoramic image, especially when their dominant position makes them a sort of landmark in space.

Structural and visual integration: Apart from the perception of Dubrovnik from a distance, structural features and perceptive qualities of the city from the inside are analysed as well, which is important for design consolidation of the archaeological site areas into their urban surroundings. Their visual integration implies preservation of valuable vistas, as well as the improvement of undermined spatial relations. Four sites whose visual exposure affects the city image have already been singled out, while the site on Lokrum (A.12) represents incorporation into the cultural landscape. Structural features with direct impact on visual integration of archaeological sites into the existing surroundings were elaborated on the example of archaeological site Na Andriji. These are primarily

25 Three archaeological sites (in the city centre/public space: A.4, A.6, A.11) are not visible in the city vistas despite the visual coverage of the area.

Table 4: Identity features of archaeological sites in relation to the spirit of place (genius loci).

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Development of the city (cent.)	13-17 +	13-17 +	13-17 +	13-17 +	12-17 +	9-14 +	9-17 +	14-17 +	5/6 -15 +	14 +	14-16 +	11-16 +
Function / character	sacral +	sacral +	profane +	profane +	sacral +	sacral +	fortification +	profane +	sacral +	sacral +	fortification +	sacral +
Connections/ events					+	+		+	+	+		+

6. Testimony/development of the city
+ (12) 100% historical evidence
(0) finding outside of the context

7. Function/reflects the character
+ (12) 100% readability of original use
(0) purpose unclear

8. Relation to events/individuals
+ (6) 50% historical sources/cultural practices
(6) 50% indirect connection

orographic conditions, size of the archaeological area bounded by clear linear elements, city walls and the boundary between two areas with different features. Topographic foundation in the northern orientation (ca 29.50 m above sea level in the south - 9.80 m above sea level in the north) is shaped by slightly sloping horizontal terraces, dominated by a paved area (*placeta)* with pits for storing wheat.

Such slope aspect of the paved area provides additional elements for the uniqueness of the archaeological area image (form, ratio, size/texture, colour). For sure, visual incorporation of that area is affected by the level of preservation, scope and form of the stratified structure of the site, but many other features need to be considered as well, in relation to the three-dimensional character of the fragmented architectural structure and its openness towards the built surroundings. Based on such exposure in the peripheral area of the city, positive impacts of visual integration were considered by grouping and connecting certain architectural structures in order to achieve uniformity and legibility of archaeological heritage (interpretational connection, bypassing promenades etc.).

Spirit of place (*genius loci*)

The assumption is that each historical landscape expresses a unique feeling and spirit of place (*genius loci*). This is especially true of archaeological sites, where the experience of place is embodied in material and non-material aspects[26] expressed through the previous form, function/use/activity or picturesqueness of ruins as elements in urban landscape. Since cultural landscape, as a result of collective activity, is created over a long period of time, exists and acts much longer than any of its components (Novaković, 2008, 46), it can provide a contextual framework for interpretation and presentation to each site. In a certain way, tradition acts through landscape as an invisible means, it transmits the relationship between people and their surroundings in the past, it includes social and cultural practices, important historical events and evokes the actions of important individuals.

The following identity features that can emphasise the uniqueness and the spirit of place of archaeological sites are considered: testimony of the foundation/development of the city; function/use/activity (reflects the character of place); relation to events and individuals.

Testimony of the foundation/development of the city: All 12 archaeological sites contribute to the knowledge about the city, about its foundation and urban development, but it is the people who, through their systems of values, can create a relationship with a certain place and provide it with a special meaning. Two archaeological sites in particular (the Dubrovnik cathedral, A.9 and the remains of the church of St Stephen, A.6) have contributed most to the research of Late Antiquity / early mediaeval layers of Dubrovnik, where the significance of historical evidence creates an *aura* of authenticity, which at the same time requires greater restrictions on the preservation and management of that heritage. Among other analysed sites, the prevalent sites are the ones which are multi-layered, with the remains of architecture that was created on those places in sequences from the early Middle Ages until the early modern age.

Function/use/activity (reflecting the character of place): The mosaic of sacral and profane topography of Dubrovnik is considered, where the readability and authenticity of the pattern of use are reflected in the

26 Québec Declaration on the Preservation of the Spirit of Place (Québec, 2008.)

Figure 10: Benedictine church and convent of St Mary on Lokrum, A.12. Remains of the northern wall of the church (Photo: Ana Laznibat).

uniqueness and the spirit/experience of place. Despite the general fact that uses are less permanent than the built form (it can take on different contents in different time periods), it is important to identify those programmes that had greater significance, more precise spatial schemes and consequently a permanent form throughout history. This is especially true of sacral architecture that in the past combined several social roles and it is illustrated by examples of sacral buildings and complexes, from the early Middle Ages to the beginning of the early modern age, which confirm the fact that Dubrovnik was an important cultural and religious centre. Thus, the largest number of archaeological sites belongs to the category of sacral architecture of the (early) medieval city (seven sites), the most important being the two (superimposed) three-naved basilicas of the Dubrovnik cathedral (A.9), the church of St Stephen on Pustijerna (A.6) and the late medieval church of St Blasie (A.10).

Archaeological results that can show the patterns of profane architecture before and after the codification of the 1272 Statute - complete the image of Pustijerna and provide an insight into the urban development of the first medieval suburb (*burgus*) in the central part of the present city (A.3, A.4). An equally important archaeological site Gornji ugao Tower (A.8) provides a testimony to the peripheral city area, the character of the industrial zone, and the modern metal foundry under Minčeta.

Relation to events/individuals: It can be seen in important events in the development of the city, in the activities of prominent individuals and in the way that information from the past, related to certain archaeological sites, can be transposed into new material and non-material meanings at present and in the future. For example, the church of St Stephen (A.6) is the first sacral building mentioned in the written historical source about Dubrovnik, the record by

Table 5: Identity features of archaeological sites in relation to urban tissue features.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Structural definition		+	+	+	X	+	+	+	+	+	+	+
Typological definition	utilitarian +	one-nave church +	double row +	rectangular block +	X	one-nave church +	fortification +	utilitarian +	three-naved basilica +	three-naved basilica +	fortification +	three-naved basilica +

9. Structural definition
+ (10) 91% readability of physical structure
(1) 9% undefined
X (1) - archaeologically unresearched

10. Typological definition
+ (11) 100% authentic typological pattern
(0) - undefined
X (1) - archaeologically unresearched

Constantine Porphyrogenitus from the middle of 10th century. Besides information about its location in the city centre, the importance of the church was confirmed by the fact that it holds the relics of St Pancras, which is also "the earliest proven cult of relic in Dubrovnik" (Marinković, 2007, 226).[27] Other reference examples have been identified as well in the religious and symbolic relationship to a certain place, and the area of the former convent of St Simon (A.5), connected with the famous Holy Swaddling Clothes of Christ, one of the most important relics kept in the Dubrovnik treasury (Lonza, 2009, 247; Ostojić, 2010, 171).

Many legends and tales are connected with the history of Benedictine convent of St Mary on Lokrum (A.12) as well, just like with the activities of Maximillian of Habsburg on the project of his residence in the middle of the 19th century (Marić et al., 2021). Such information, related to the events or individuals significant for their historical, cultural and scientific contribution, should encourage interpretations and contemporary artistic expression of archaeological presentation.

Urban tissue features

The research of archaeological sites within the city relies on the historical development of the area, on the comparison of spatial-temporal relationship (synchrony, diachrony) of the general physical structure which is the subject of morphological analysis. The information obtained from the research of previous urban tissue patterns, when overlapped with the contemporary city, should emphasise constitutive elements and the principles of continuity of development of a site (Figure 11).

That is why the identity features pointing to the urban tissue features were analysed in relation to structural and typological definition of archaeological sites.

Structural definition: It was considered according to how well a certain spatial-functional area was researched in the contemporary and historical context. The analysis includes structural components of a site, patterns of spatial elements in a constitutive relationship (building remains, land subdivision, streets), whereby the ratio of private and public areas is especially interesting, as a result of social preconditioning, various restrictions in ownership or the type of function/use/activity in the past.

How detailed the research is depends on the size of a site and its preservation, i.e., the readability of the physical structure of a site, as well as the possibility of connecting the sites to various kinds of sources and research methods. For example, when it comes to the archaeological site on Pustijerna (A.3), structural features can be considered in the full scale of urban tissue (from material patterns and construction elements to the patterns of larger entities, such as buildings/land plots within a block or building area). At the archaeological site of the convent of St Andrew (A.1), especially in its part along the southern city walls, it is possible to describe urban tissue at a low level, while terrain configuration enables better preservation of the archaeological findings somewhat to the north of the presumed church.

Archaeological sites of sacral buildings and complexes (A.1, A.2, A.6, A.9, A.10, A.12), in line with the proper orientation,[28] are (mostly) placed in the east-west direction which enables insight into larger building plots, whether they followed terrain configuration or overlapped with the longitudinal streets of the city. On the other side, the researched housing blocks on

27 According to the Dubrovnik chronicles, the relics of other Roman martyrs, the first patron saints of the city, were kept in this church as well.

28 The rule that the sanctuary of Christian churches needs to be directed towards east was implemented from the 5th century on, but since the Baroque period it has not been obligatory any more (Badurina, 1990, 442).

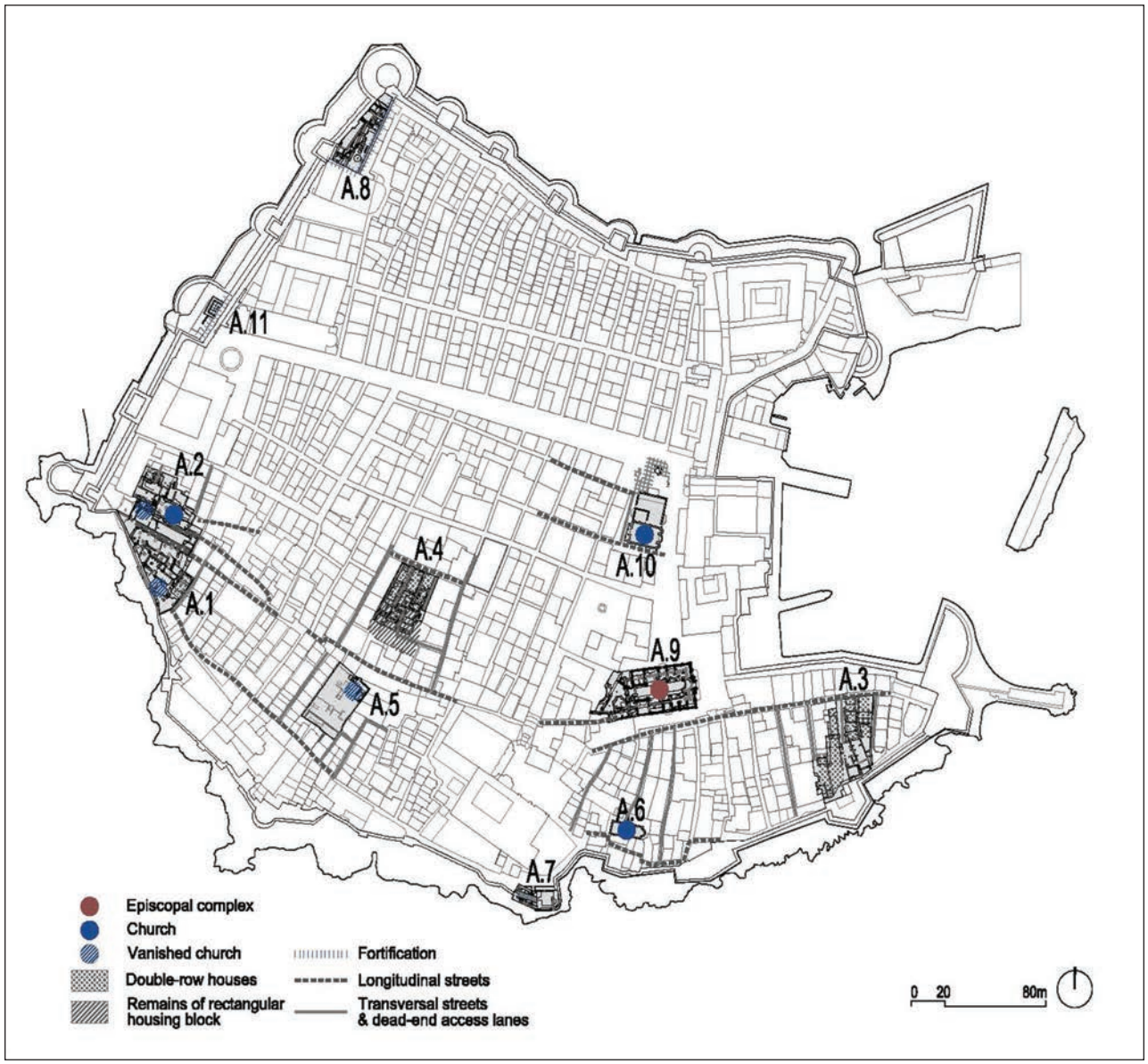

Figure 11: Some analyses of principal features of archaeological sites show their constitutive relationship with the city. They point to a great alignment in building direction, land subdivision and street systems: churches and sacral complexes are (mostly) placed in the east-west direction, compatible with longitudinal streets of the city; the researched housing blocks (from an excavation of the site) organisationally follow transversal streets (mostly) north-south (Authors: Zehra Laznibat, ARHEO PLAN d.o.o. Dubravka).

Pustijerna (A.3) spatially and organisationally follow the direction of the transverse (north-south) streets and they have mostly implemented the original land subdivision of smaller square plots.

A rectangular housing block (partly included in the scope of the A.4 site) shows an outline of an older organisation of that area, before the 1296 regulations. This refers to the remains of houses with inherited form and orientation with a dead-end access lane in the inner part of the housing block.

Typological definition: It is the result of consideration and interpretation of the discovered building remains in relation to the existing function and spatial schemes of built heritage. Specificity of a given solution (visible in the findings themselves) is translated into certain structural rules and key features important for their typological classification.

In relation to the spatial-functional category, typological disposition of the discovered buildings or complexes was considered with regard to profane, sacral

Table 6: Identity features in relation to connectivity and accessibility of streets leading to archaeological sites.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Connectivity	3	1	24 +	5	3	4	4	2	19 +	12 +	14 +	X
Accessibility	1.78571 +	1.4381	2.68818 +	2.3095 +	1.24098	1,902 +	1.88396 +	1.88399 +	3.34753 +	3.27791 +	3.0808 +	X

11. Connectivity (*Connectivity graph*)
+ (4) 36% streets with many connections / >10 (red, yellow, green)
(7) 64% streets with several connections (dark blue)
X (1) - not relevant

12. Accessibility (*Integration [HH] R3*)
+ (9) 82% integrated / >1.5 (red, yellow, green)
(2) 18% segregated (dark blue)
X (1) - not relevant

and fortification architecture. General agreement is that the house is the *basic type* of urban tissue (Grujić, 2013, 14), while all the other building types belong to special types (ISUF, 2023). The presented archaeological sites in Dubrovnik (A.3, A.4) show two basic types of profane architecture. The first type are houses built in a double row with a canal in the middle, while the other type is defined by houses within a mediaeval rectangular block (along dead-end access lanes, irregular system - plots of different sizes and orientation).

Archaeological sites with the remains of sacral architecture can show the basic cluster of longitudinal buildings (Marasović, 1994, 16), with numerous derivatives with respect to the size, indentation and articulation of architecture. The type of three-naved basilica (the church of St Mary on Lokrum, A.12; late mediaeval church of St Blaise, A.10) and the type of one-nave building (early mediaeval church of St Stephen, A.6, the church of St Mark, A.2) belong to this category. The type of longitudinal building with a dome, illustrated in the example of the Dubrovnik cathedral (A.9: early mediaeval and Romanesque three-naved basilica) also joins that category.

The disposition of the found remains of fortifications (A.7, A.11), defined by the emergence of firearms and the evolution of war technology, includes the division into: mediaeval and modern fortifications.

Streets and accessibility of archaeological sites

Space Syntax Analysis is used to evaluate the accessibility of archaeological sites in relation to the city's street network. An axial map was created for the analysis of urban space, a geometrical model of street network that can be translated into a typological graph.[29] This is an axial analysis that studies the degree of (inter)connectivity of the movement routes inside the historic centre of Dubrovnik (inside the city walls).

Degrees of connectivity and the degree of accessibility are considered based on the results of the axial analysis (Figure 12).

Connectivity: Streets leading to archaeological sites are analysed by measuring the number of direct connections they have with other streets in their immediate vicinity. According to the Connectivity graph, the street next to the archaeological site on Pustijerna (A.3) has the highest connectivity value, while the least connected street is the one leading to the archaeological site of the convent of St Mark (A.2). Based on the conducted analysis, three other sites are located in high connectivity areas (A.9, A.10, A.11). That is why this simple analysis in relation to the degree of direct connectivity of each street presents a reliable indicator of their significance in the entire urban system as well.

Accessibility: The degree of accessibility that a certain street (site) has in relation to all other streets in the urban system is estimated by using integration analysis.[30] Three archaeological sites in the city centre (A.9, A.10, A.11) show a high value of global integration, while the most segregated site (A.5) is located on the southern urban periphery.[31] However, local integration values are important for this research since they are in correlation with the pedestrian flow at the city level (Van Nes, Yamu, 2021, 54). Based on that, the greatest improvement of spatial

29 An All-Line Map was created first by using the Depthmap software and then it was reduced to the Fewest-Line Map which is usually used in Space Syntax Analysis. All the spatial elements of the street network are presented by mutually connected axial lines. This makes it possible to calculate to what degree each axial line is connected with all other axial lines in a given system, which also enables measuring their typological depth (Van Nes & Yamu, 2021, 36-39).

30 »A global integration analysis calculates how spatially integrated a street axis, i.e., axial line, is relative to all other streets in the system« (Van Nes & Yamu, 2021, 46).

31 Global integration uses radius n for the entire pre-defined system, while local integration is calculated within a certain radius (e.g. radius 3) which is in correlation with local subcentres (Craane, 2013, 32).

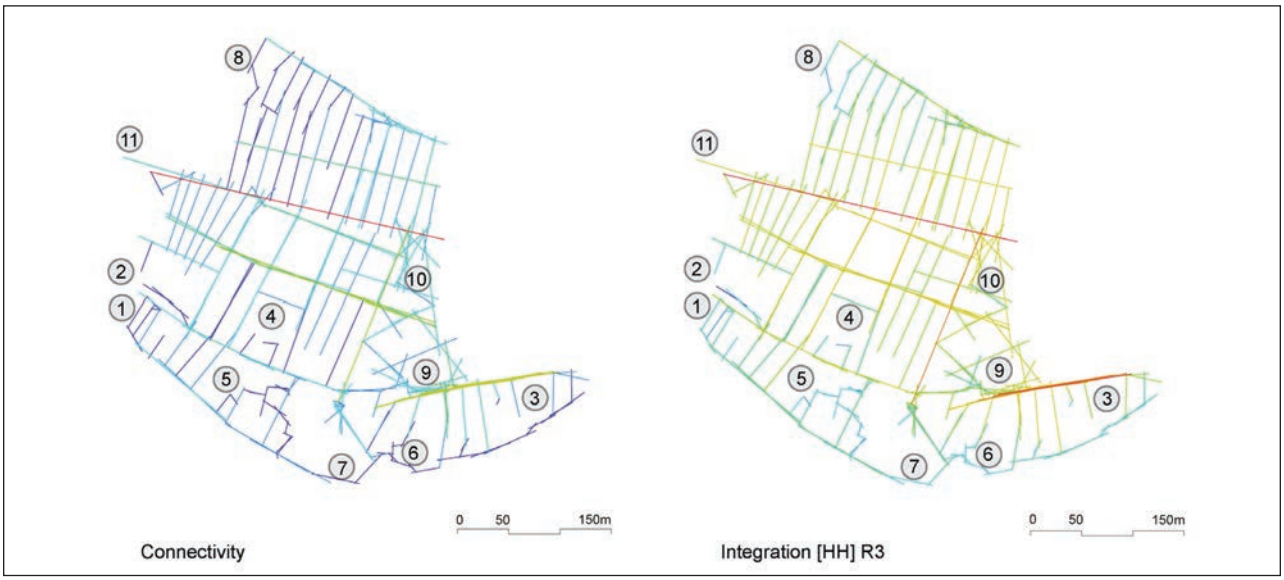

Figure 12: Historic centre of Dubrovnik with the positions of archaeological sites (table 6). Connectivity graph; this analysis is useful for understanding the degree of connectivity of a chosen street (toward an archaeological site) to its immediate surroundings. Integration [HH] R3 (Local integration analysis); the degree of integration is shown in a spectrum from red to dark blue, i.e., ranging from high to low value (Author: Zehra Laznibat).

and functional conditions can be predicted for the area of Pustijerna (A.3) and the school garden (A.4), as well as indirectly (diffusely) on other sites in the peripheral parts of the city (A.6, A.7, A.8, A.1).

Style features

Style plays an important role in archaeology and art history, especially due to the fact that it is a concept based on dualism – at the same time it contains a previous event and interpretation (Barbanera, 2014). On one hand, it implies a special manner of action (of an individual or a group) visible in material culture, while on the other hand it is also an analytical tool for categorising archaeological phenomena within a certain chronological sequence and the basis for their interpretation. In this paper, style is considered as a result of design, technological and spatial-functional conception confirmed on the found building structures or complexes.

Relevant features that can point to the style features are presented on the example of archaeological sites in Dubrovnik and they include: coherence of conception; specificity of function/consistency of conception.

Coherence of conception: It is recognised in the consistency of design (artistic) performance, in the building system of the time of creation and existence of a certain asset, as well as in relation to its original function.[32] Three sites which lack some of the mentioned characteristics of material culture have been singled out, so they remain physically and stylistically not defined enough. This primarily refers to the absence of the convent church of St Andrew (A.1), the finding of the southern city wall (A.7) that is not articulated enough as well as the absence of authentic material structure (from the time of origin) in the Pile Tower (A.11).

All the other archaeological sites may show certain patterns of the design conception, while some of the significant characteristics are: basic form and size (proportions, orientation, modelling of masses), spatial relations, common expression of decorative elements, the rule of adding, superimposing etc. Besides everything mentioned, the focus is on those aspects of style that differentiate one function/use from the other.

Coherence of the spatial conception can be seen in the example of two three-naved basilicas found underneath the Dubrovnik Baroque cathedral (Figure 13, A.9), which can temporally and stylistically present the relationship of superimposing between the first early medieval church with a number of successive adaptations and the new, gradually built Romanesque basilica above it (Stošić, 1988; Zelić, 2014). Spatial preconditioning of both basilicas, and partly their design similarity, were analysed, where the technological aspect of building, various systems of construction, the quality of architectural sculpture, liturgical installations and other findings become integral indicators of style and the basis for relative dating. Previous researchers have also connected the adaptations and gradual transformation of the early medieval church with

32 According to Vitruvius's tratise *De Architectura Libri Decem* (in the third chapter of the second book), the main qualities of architecture are: *firmitas*, *utilitas* and *venustas*.

Table 7: Identity features in relation to style features of archaeological sites.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Coherence of conception		+	+	+	X	+		+	+	+		+
Function / consistency	social +	sacral +	profane	profane	X	sacral +	social	social +	sacral +	sacral +	social +	sacral +

13. Coherence of conception

+ (8) 73% compatibility of all three style determinants

(3) 27% a certain style determinant is absent

X (1) archaeologically unresearched

14. Function /consistency of conception

+ (8) 73% specific use or design scheme

(3) 27% low degree of consistency

X (1) archaeologically unresearched

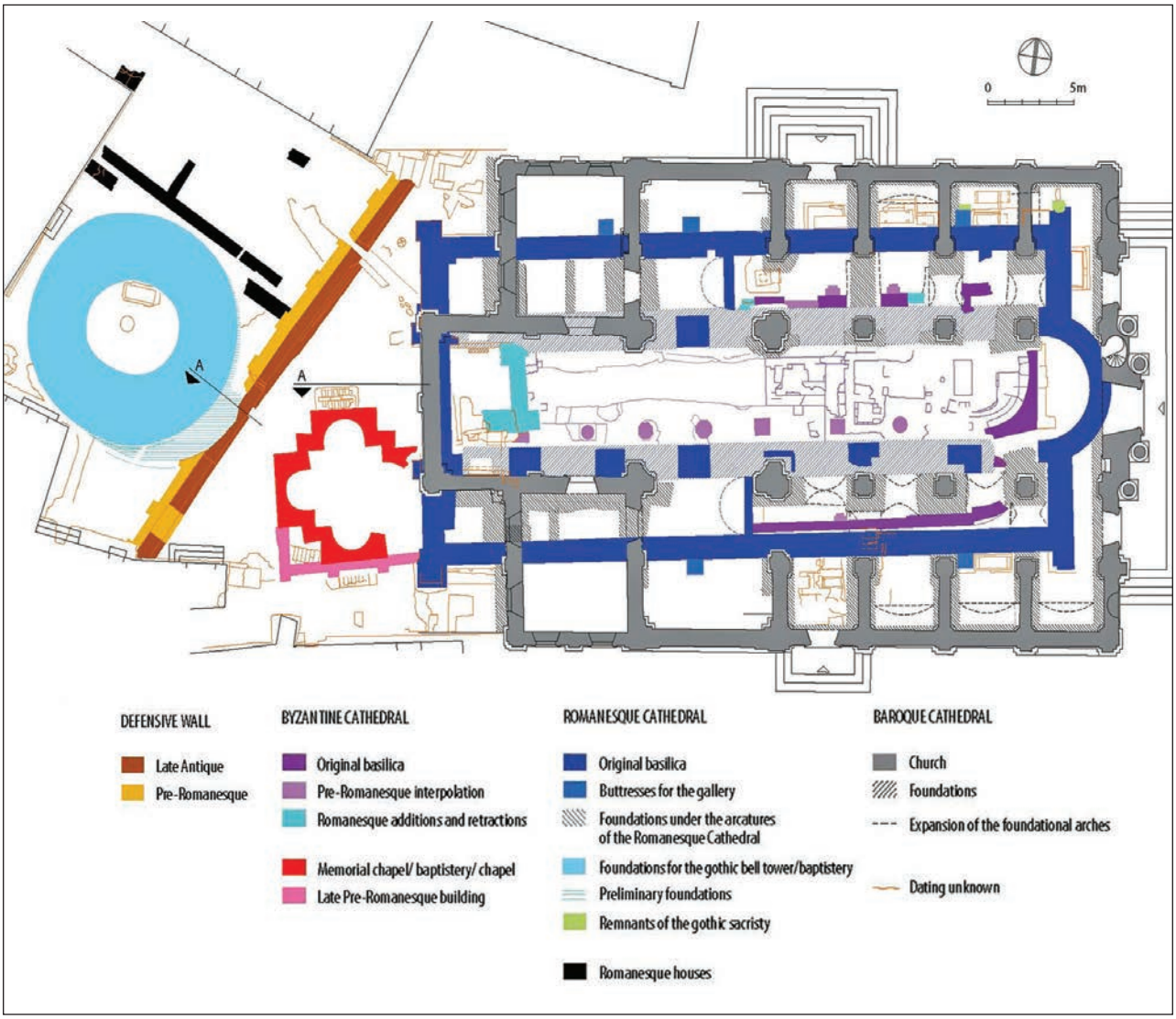

Figure 13: Dubrovnik Cathedral and Bunić Square, schematic representation of the sequence of construction according to the archaeological findings (interpretation of the findings by J. Stošić, drawing by I. Tenšek; source: D. Zelić, 2014).

the functional requirements, closely related to the reform of the church and the development of liturgical practice (Stošić, 1988, 22; Zelić, 2014, 38).

Furthermore, the example of a utilitarian complex of the metal foundry (A.8) also shows the coherence of all style features (design, technological and functional) which at the same time present the character of a city area. Archaeological areas of residential city quarters (A.3, A.4) may show the basic (settlement) pattern with regard to design and style, where the aggregation of building plots preserves the medieval organisation of the tissue and generally small amount of architectural decoration.

Specificity of function/consistency of conception: Function is a feature that is perceived in relation to the role that an architectural building (once) had in its social context. It is clear from the previous examples of archaeological sites that sacral buildings, due to their function from the aspect of liturgy as well as the favour of community, had permanent design and style patterns resistant to radical changes (with the exception of decay or natural disaster). The best example here is the long-lasting Romanesque cathedral (A.9) which had existed for more than half a millennium, until the 1667 earthquake. Besides the mentioned cathedral, all the remains of (found) sacral architecture (A.6, A.10, A.12, A.2) prove the consistency of the spatial conception. Some of the examples (A.9, A.10) also testify to the continuity and variability of a certain archaeological template, to the common practice of commissioning and imitating the already seen solutions at that time (Fisković, 2015, 64).

The other group of sites was recognised in relation to the programmes of social purpose that indicate economic and cultural flourishing of Dubrovnik in the past, and they are as follows: fortification system (A.11), communal granary (the convent of St Andrew, A.1) and the complex of the protoindustrial zone under Minčeta (A.8).

Material

The material of an archaeological finding presents a testimony to events and impacts on an archaeological structure, from the moment of its creation, during its lifetime and discontinuation to its finding, documenting and final presentation.

Identity features of archaeological sites have been identified in relation to the authentic system of building and the level of preservation of a finding, based on the procedures carried out to prevent or merely slow down the decay of the constituent material.

Properties of the material/construction: Since physical matter is the evidence aspect of an archaeological finding, the full significance of material was considered not only at the level of physicochemical properties, but also including distribution (material patterns) in a certain form, size and relationship. Further differences, physical properties and mutual relationships of certain constituent materials are reflected in the building forms and the changes created in time or due to decay (Figure 14).

Based on an analysis and mutual comparison of the remains of building structures, authentic patterns of material have been identified in almost all archaeological sites as well as patterns of larger entities (hierarchically organised) which make it possible to recognise primary identity features based on temporal and spatial criteria. Building techniques and construction systems characteristic of a certain period were identified, such as different types of wall constructions (the wall of the Late Antiquity castle from 5th/6th century, the remains of sacral and profane architecture ranging from 8th to 17th century), city fortifications (9th–17th century), the remains of mediaeval and modern vaults, public surfaces paved with brick (15th–19th century), pits for storing wheat (15th century), part of a sewerage canal (15th century), the technological plant of the metal foundry (15th–17th century) etc.

Ground floor presentation of the Pile Tower (A.11) and the southern part of the site Na Andriji where the remains of the convent church of St Andrew (A.1) have not been found are exceptions to the representation of original material patterns, but many other findings within that area, such as 19 pits for storing wheat (15th century) and *placeta*, an area paved with brick in the herringbone style (*opus spicatum*) contribute to the importance of the site.

Previous interventions at the site (authenticity of the finding): The premise here is that archaeological material (archaeological finding) in all protection and management procedures presents a fundamental feature, active architectural material that needs to be preserved in its authenticity (Latina, 2012). Previous approaches to preservation were analysed based on the principles defined in international documents on protection that provide a professional framework for both previous interventions[33] and the future ones. Based on that, protection works ranging from conservation, preventive conservation, presentation or revitalisation of the archaeological finding areas have been conducted on almost all archaeological sites.

According to the set plan of an exhaustive analysis and evaluation of the condition of the researched archaeological sites, all the components upon which the identity of heritage is built were considered one by one. Based on their mutual comparison, relevant aspects of a certain urban tissue (whose component is archaeological heritage) recognised in spatial preconditioning of a place, circumstances of socio-functional creation and structural stages in the development of a found structure or complex were integrated.

33 Measures to preserve archaeological sites are based on the following principles: 1) authenticity/integrity of an archaeological finding; 2) avoiding physical damage; 3) compatibility of materials and building techniques; 4) recognisability of a new material (*distinctness*); 5) reversibility; and 6) contemporary intervention in the potential integrity of an archaeological site.

Table 8: Identity features in relation to the material of archaeological sites.

	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
Material properties	+	+	+	+	X	+	+	+	+	+		+
Previous interventions	+ conserv.	+ conserv.			X	+ revital.	+ conserv	+ revital.	+ prev. conserv.	+ conserv.	+ presen.	+ revital.

15. Properties of material/construction

+ (10) 91% authentic material pattern
(1) 9% absence of authenticity
X (1) - archaeologically unresearched

16. Previous interventions (authenticity of a finding)

+ (9) 82 % intervention based on theoretical principles
(3) 18 % neglect, reconstruction/new building
X (1) - archaeologically unresearched

Figure 14: Brick pavements in the heringbone style (opus spicatum): area of the communal granary (Na Andriji); in front of the church St Blaise (Photo: ARHEO PLAN d.o.o).

By overlapping their common features based on the previously set criteria, three groups of identity features (visual, socio-functional and historical-structural) will ensure a comprehensive approach to integration of the sites into historical urban landscape.

DISCUSSION

The research deals with identity features, principal components and characteristics of archaeological sites, which are the basis for contemporary protection and management procedures. This is significant for Dubrovnik because an integrated approach to protection of that heritage has not been a subject of scientific interest since the beginning of archaeological research following the 1979 earthquake.

The aim set in this research was achieved through a consistent analysis of sites, followed by their systematic comparison, in order to identify properties characteristic of a certain place, period or typological pattern of realisation. It is clear that the importance of an archaeological finding is confirmed by cognitive aspects of intrinsic nature of that finding that overcome spatial and temporal boundaries in the urban tissue.

The results of previous archaeological and urban planning research have been combined and some key urban elements which are the basis of Dubrovnik's identity have been considered in their further analysis and graphical representation. These elements are primarily the location and organisation of the episcopal complex, several key localities of mediaeval sacral topography, the layout and direction of streets, determining public and profane centres and certain components of the city defence system.

The aim of active analysis and systematic comparison of archaeological sites is to contextualize them within the Dubrovnik historic area, and the research results have been systematised in two ways:

- identity features of 12 archaeological sites have been identified in relation to seven reference topics. Parameters were defined earlier in this paper

Table 9: Classification of identity features into three groups based on the integrity condition.

dentity features	Visual integrity	Socio-functional	Historical-structural
The character of urban location			
1. size > 900m^2	+		+
2. geomorphological features	+		+
3. position	+	+	
Visual exposure in the city image			
4. identity/recognisability of the contrasting image	+		
5. visual integration/level of impact	+		
Spirit of place (genius loci)			
6.testimony/development of the city		+	+
7.function/use/activity (reflecting the character of place)		+	+
8.relation to events/individuals		+	+
Urban tissue features			
9.structural definition	+		+
10.typological definition		+	+
Streets and accessibility of archaeological sites			
11. connectivity		+	
12. accessibility		+	
Style features			
13. coherence of conception	+	+	+
14. function/consistency of conception			
Materials			
15. properties of material/construction	+		+
16. previous interventions (authenticity of a finding)	+	+	

in order to mutually analyse all the identified features and components of sites. The final results may affirm the empirically confirmed key features of the sites and provide a basis for their integration into the Dubrovnik historic area (chart 1).

- collective representation of all 12 sites is based on the valuation of recognized identity features (that potentially possess value); it presents the cognitive potential of each site and quantifies their contribution to the city image (chart 2)

Furthermore, the conducted research provides a basis for a complete (visual, functional, structural) integration of archaeological sites into the Dubrovnik historical and contemporary surroundings. Therefore, the discourse has been changed from a one-sided, technical and material approach to the contextualisation of heritage within historical urban landscape. The qualities of archaeological sites that are valorised with regard to a certain property and contribute to the integrity of the whole have been singled out. By understanding different components, it was necessary to present the visual, functional and structural integrity of archaeological sites, which was done in three basic steps:

1.) Visual features: Visual aspect of the sites was analysed in relation to perception (visibility), natural preconditioning and artificial characteristics, from which their proportion in the physiognomy of the city is recognised as well. The example of the archaeological area Na Andriji (A.1, A.2) has been singled out, due to a number of features that affect its high exposure, but also numerous restrictions on the changes of city vistas.

2.) Socio-functional features: The significance of a certain archaeological site in the city as a whole was considered based on the social role and processes that were its driving force in the past. The examples of sacral, fortification and profane architecture have been singled out, as well as various utilitarian programmes that can illustrate economic contribution to the development of the city. Several sources of evidence and research methods are used in the research; the space syntax analysis results, in correlation with the local neighbourhood, can empirically justify urban reorganisation of the area of Pustijerna (A.3, A.6).

3.) Historical-structural features: Archaeological sites were considered in a spatial-temporal relationship, by documenting those structures in the urban tissue which are the result of previous patterns of activities and developmental processes. The compatibility of historical-structural relationships was corroborated by the example

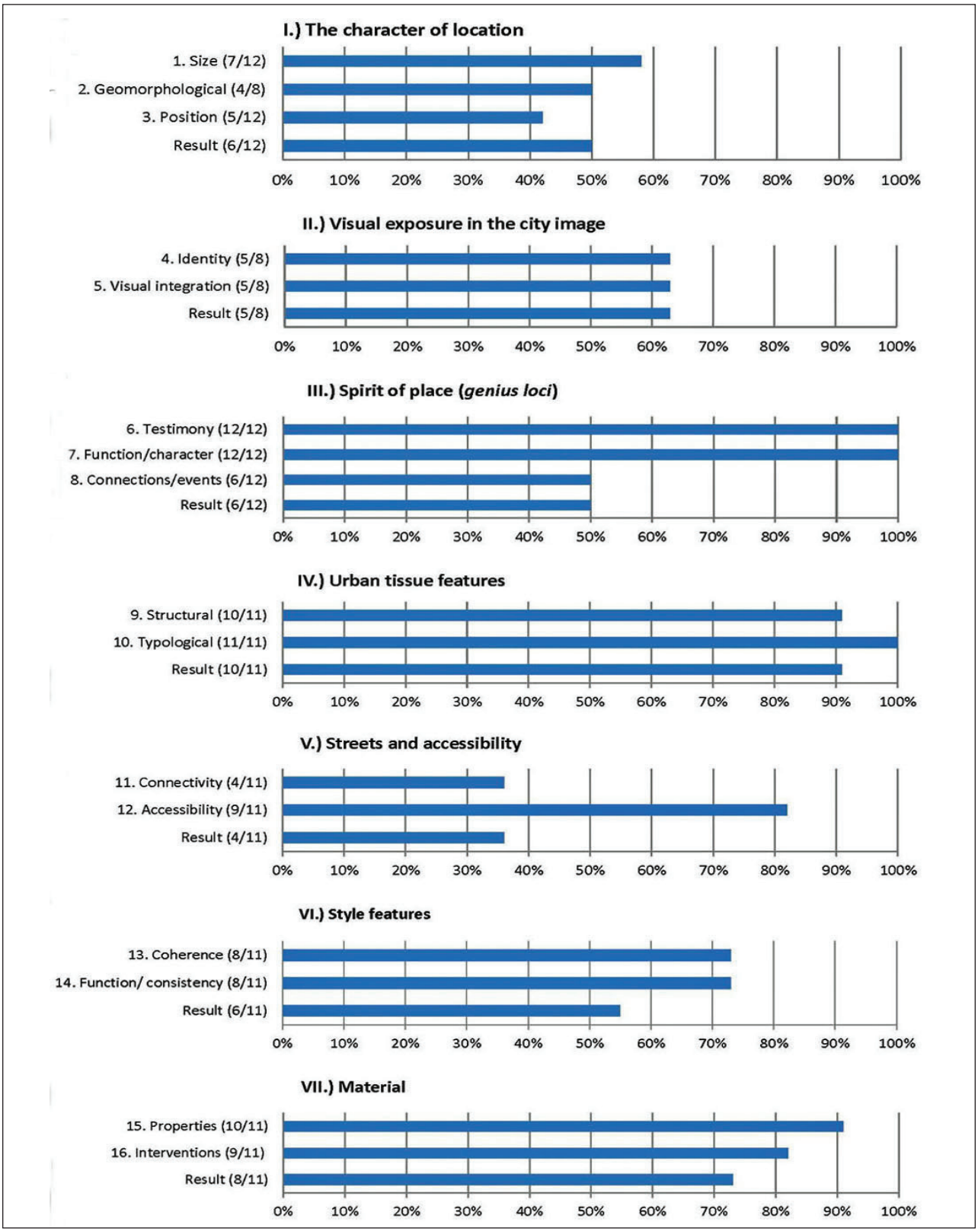

Chart 1: Identity features - the result of a comparison of archaeological sites under the seven topics to determine their principal properties and components. The level of characteristics is recognised by the overlap of several identity features in a complementary relationship.

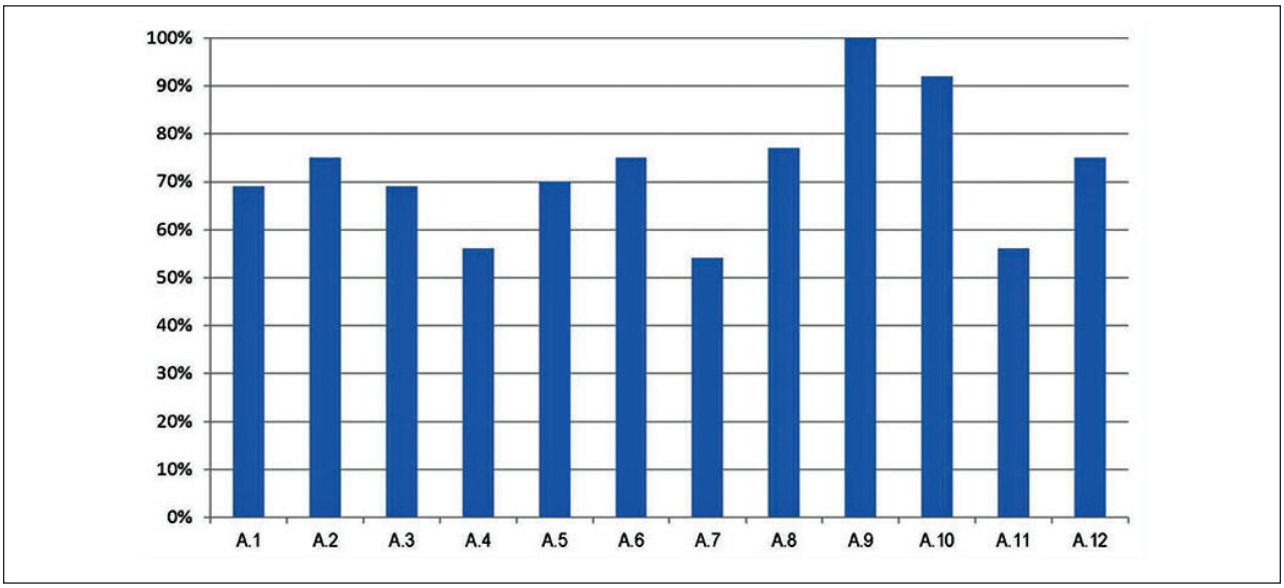

Chart 2: Collective representation of all identity features for all 12 sites. It implies the evaluation of the condition and comparison of the sites based on the same questions which are used to determine the level of qualities as well as the contribution of each archaeological site to the city as a whole.

of two longitudinal three-naved basilicas discovered in the underground of the Dubrovnik cathedral (A.9) which, by testifying to the continuity of form, confirm the appropriateness of that architectural type to the liturgical (functional) requirements and other characteristics of the place.

Following the systematisation of three groups of identity features (tables 2-9), basic components that contribute to the integration of archaeological sites into the Dubrovnik historic area have been singled out.

By providing a detailed insight into the components and features of archaeological sites, the conducted research is a principal reference for valorisation of immovable archaeological heritage. The presented grouping of key features of the Dubrovnik sites not only reflects the preconditioning of visual, functional and structural integrity, but also directly relates those properties to the corresponding set of values, thus becoming one of the starting points for further valorisation of immovable archaeological heritage.

CONCLUSION

The research is focused on identity features of archaeological sites with the aim of aligning them with the contemporary approaches to protection and management. Archaeological sites that are the subject of this paper have been formed during the restoration of Dubrovnik, since the 1980s until today. Unlike numerous research of archaeological heritage that is mostly focused on the study of Dubrovnik's urban history, the focus of this paper are identity features or key characteristics of heritage that are recognised as transferring the continuity of development.

Unique urban properties of a site such as, the layout and direction of certain streets, the location of the episcopal complex, several localities of mediaeval topography and the arrangement of public and profane city centres, have been considered based on the results of the conducted research and their graphical interpretation in the urban tissue.

The research of 12 archaeological sites was summarised into seven basic topics under which the identity features were identified. The evaluation of the condition and mutual comparison of the sites based on the same questions were conducted (parameters for the evaluation of key components were singled out in a table), which serve to measure the level of features, recognisability and the uniqueness of each archaeological asset. This shows that, in relation to the **character of location**, six archaeological sites have the advantage of spatial or visual accessibility, while seven of them are big enough for the readability and experience of a certain area. Based on **visual exposure**, four sites that greatly contribute to the identity image of the city have been singled out, while the site on Lokrum illustrates integration into the cultural landscape. Six archaeological sites can entirely present the **spirit of place** concept (genius loci), divided into three levels of features. Ten sites that can structurally and typologically show the patterns of historical building have been singled out by **analysing the urban tissue** features. By using the Space Syntax Analysis, it was determined that four sites have high physical accessibility, while five other sites in correlation with secondary streets and their neighbourhood (local integration) can achieve improvement of

Table 10: Principal features contributing to the integration of archaeological sites in the Dubrovnik historic area.

Identity features of archaeological sites	**Description of a component/feature**
Visual features	big enough for morphological readability; experience of a spatial-functional whole; orographic conditions; height above mean sea level: flat or sloping terrain; location: centre / periphery inside historic urban core, island of Lokrum; *fringe belt* concept; high exposure in the city image (north-facing aspect, size of urban void, sharpness of border, peripheral position in the urban core); low exposure (flat terrain, closedness within urban formation); size of a site and how researched it is; preservation and readability of a finding; authenticity of a finding (previous interventions at the site).
Socio-functional features	many new research questions; multi-leyerdness of archaeological heritage; the authentic pattern of function reflects the character of place; material evidence clarifies long-lasting processes; archival records corroborate archaeological findings; place with a religious or holy importance (cult of relics); mystique of a place (legend, oral tradition, non-material practice); relation to a prominent individual; connectivity of streets (indicator of importance of a place); emphasis on a destination/centre of city activity (indicator of spatial accessibility).
Historical-structural features	episcopal centre: "changes the image of the earliest history of Dubrovnik" (Prelog, 2003, 118); monastic urban element: churches and sacral complexes influence the shaping of the urban tissue; larger building plots (aggregation), east-west oriented, compatibility with longitudinal streets; types of sacral architecture: longitudinal buildings and longitudinal buildings with a dome; residential (profane) architecture: the basic module is a one-room house; geometric plan with transversal streets (mostly) north-south; free plan along an inner dead-end access lanes; types of residential architecture; double-row houses; mediaeval rectangular housing block; types of fortification architecture: mediaeval and modern fortifications. design style features: expression of a silhouette, special landmarks, spatial relations; architectural sculpture, adding and superimposing elements; technological style features: constructive systems, redecorations, techniques/building practices, artistic performances etc. relationship between form and function: sacral architecture (development of liturgical practice); profane architecture (representativeness, adding plots); fortification (emergence of firearms, development of ammunition); utilitarian requirements / communal granary (certain production process).

spatial conditions. In order to consider **style features**, two levels of features were analysed - the coherence of conception (design, technological, functional) and the specificity of purpose/consistency of conception, where six sites can confirm the level of coherence of features. In relation to the level of preservation of constituent materials (by overlapping the features of material patterns and previous interventions), eighth archaeological sites that can present the **level of preservation** of the physical structure of archaeological findings have been singled out.

This paper has also considered the cumulative effect of identity features on cognitive potential and the level of features of archaeological sites; it can be the basis for planning various site enhancements, but also for controlling the effect of those changes on the city as a whole.

Since the research was focused on contextualization of archaeological heritage, fundamental properties of the discovered remains of material culture are no longer considered in isolation but rather in interdependence of visual, functional and structural integrity of an individual archaeological asset and the historical urban landscape it belongs to. Three groups of identity features that have been established present a way to take the identified properties to the level of reference values that can be the basis for directing all further approaches to integrated protection and management.

IDENTITETNI DEJAVNIKI ARHEOLOŠKIH NAJDIŠČ NA ZGODOVINSKEM OBMOČJU DUBROVNIKA

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POVZETEK

V pričujočem prispevku se ukvarjamo z opredelitvijo identitetnih dejavnikov za dvanajst arheoloških najdišč na zgodovinskem območju Dubrovnika, ki je na seznamu Unescove dediščine. Arheološka najdišča so nastala med obnovo mesta od leta 1980 do danes. V nasprotju z mnogimi raziskavami arheološke dediščine, ki so bile usmerjene na proučevanje urbane zgodovine Dubrovnika, je glavno težišče tega dela prepoznati identitetne dejavnike kot prenašalce razvojne kontinuitete. Jasno je, da pomembnost arheološke najdbe potrjujejo kognitivni vidiki svojstvene (intrinzične) značilnosti, zlasti tistih posameznih delov, ki tvorijo identiteto Dubrovnika. Prikazan je tudi razpored in usmeritev posameznih ulic, namestitev episkopalnega centra, nekaj lokalitet srednjeveške topografije in javnih ter profanih središč mesta. Izdelana je ocena stanja in primerjava najdišč, pri čemer se je sledilo enakim kriterijem, s katerimi lahko merimo stopnjo značilnosti, prepoznavnosti in edinstvenosti posameznega arheološkega najdišča, s tem pa tudi raven njihove posebnosti in prepoznavnosti na območju celotnega mesta. Rezultati izvedene raziskave so sistematizirani na dva načina: sklepni pregled identitetnih dejavnikov lahko potrdi empirično ugotovljene označbe proučevanih najdišč in da osnovo za njihovo integracijo v zgodovinsko območje Dubrovnika (graf 1); skupni prikaz izraža kognitiven potencial vsakega najdišča posebej in kvantificira doprinos k celovitosti mesta (graf 2). Vzpostavljene tri skupine identitetnih dejavnikov dubrovniških najdišč so odraz njihove vizualne, funkcionalne in strukturne integritete, s čimer prehajajo na neposredno raven z ustreznim naborom vrednot, enim od izhodišč za nadaljnje vrednotenje nepremične arheološke dediščine.

Ključne besede: identitetni dejavniki, arheološka najdišča, urbana morfologija, zgodovinska urbana pokrajina, zgodovinsko območje Dubrovnika

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