

Projektiranje je istraživanje

Design is Research

Brojni su razlozi koji dokazuju da je arhitektonski projekt istraživački rad.

Arhitektonska praksa, koju mi arhitekti nazivamo projektiranjem, od početne zamisli do idejnog projekta, zatim izvedbenog projekta te nadzora gradilišta, jest ili bi trebala biti pravi istraživački rad. Isto tako, prijenos odnosno poučavanje projektiranja jest i mora biti pravi istraživački rad. U ovom tekstu, naslovljenom *Projektiranje je istraživanje*, želim pokazati da je projektiranje istraživanje jer, iako je to možda teško shvatiti onima koji nisu arhitekti, projektiranje jest istraživanje. Bilo koji arhitektonski projekt jest ili bi trebao biti pravi istraživački rad.

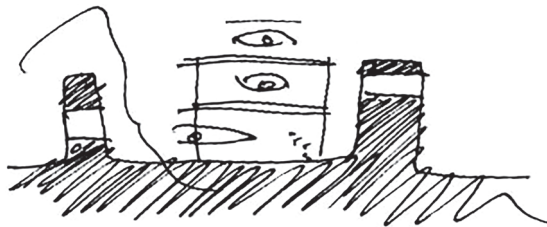
There are countless reasons that demonstrate why an architectural project is a work of research.

Architectural practice, which we – architects – call project design, from the initial idea to the basic project, followed by the construction or working project and from there to site management, is or should be a real work of research. And by the same token, its transmission, the teaching of project design is also and must be a real work of research.

In this text, *Project Design is Research*, it is my intention to show how design in architecture is research. Because, while this may be difficult for those who are not architects to understand, project design is research. Any architectural project is or should be, a real work of research.

WHAT IS PROJECT DESIGN? To design a project is to think, to reflect and to decide, to respond, to conceive; to

napisao_written by **ALBERTO CAMPO BAEZA** | skice_sketches
by ALBERTO CAMPO BAEZA



ŠTO JE PROJEKTIRANJE?

Projektiranje podrazumijeva razmišljanje, razmatranje i odlučivanje, pružanje odgovora, osmišljavanje; pažljivu analizu svih podataka i, zatim, dijagnozu problema s ciljem njegova rješenja. Projektiranje je ozbiljnije i sistematičnije nego što se obično misli. Arhitektonski projekt razvoj je ideje koja je rezultat dugog procesa. Ideje koja se može realizirati te koja, kao što je sa svakim istraživačkim procesom, uvijek ima cilj i konkretan rezultat. Arhitektonski projekt nije tek skica prve stvari koja arhitektu padne na pamet. To nikada nije puki hir, proizvod genijalnog uma. Projektirati znači pružiti jedinstven odgovor na niz pitanja. Projektirati znači pružiti jednostavan odgovor na složeno pitanje; odlučiti se za jednu od mogućnosti. Projektirati znači osmisлити ideju, koja, kada je oblikovana, nudi odgovor na sva postavljena pitanja.

thoroughly analyse all existing data and then diagnose a problem in order to finally solve it. Project design in architecture is something more serious, more scientific than most people believe.

An architectural project is the development of an idea resulting from a long process. An idea that is capable of being built and, as with every research process, one that always has a purpose and a concrete result.

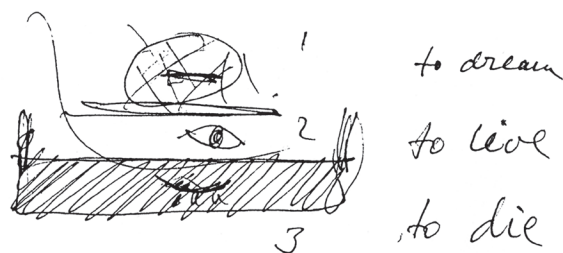
An architectural project is not simply drawing sketches of the first thing that comes to an architect's mind. It is never a mere whim, the product of an ingenious mind.

To design is to give a unified response to a multitude of questions. To design is to give a simple answer to a complex question. It is to adopt a decision from a multitude of possibilities. To design is to generate an idea which, when materialized and formalized, is capable of solving all the questions raised.

In order to design one needs to know the problem well, to recognize it, and to know how it has been resolved throughout history, so as not to reinvent the wheel. It involves knowing the place well, being cognizant of the conditions and the requirements, the existing conditions and the wishes of the person commissioning the assignment, being familiar with the new technologies that make it possible to find new solutions.



Uredska zgrada,
Zamora, Španjolska
Office Building,
Zamora, Spain



▲
 Kuća Moliner,
 Zaragoza, Španjolska

Moliner House,
 Zaragoza, Spain

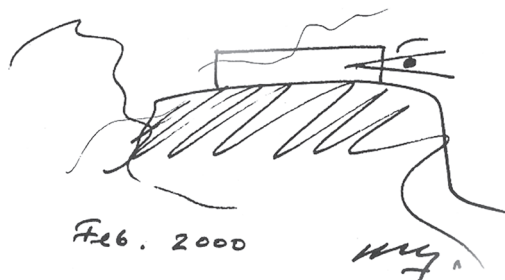
Kako bi se moglo projektirati, treba dobro poznavati problem, prepoznati ga i znati kako je rješavan tijekom povijesti, kako se ne bi izmišljala topla voda. Podrazumijeva dobro poznavanje mjesta, shvaćanje uvjeta i zadataka, postojećeg stanja i želja naručitelja, kao i poznavanje novih tehnologija koje omogućuju pronalazak svježih rješenja. Projektiranje zahtijeva istraživanje. Kako bi moglo biti drugačije? Istraživanje, isprobavanje, ispitivanje, traženje... Ukratko, temeljita analiza problema s ciljem pronalaska najboljeg rješenja, koja uključuje sve vrijeme i posvećenost koja je potrebna kako bi se postigao najbolji mogući rezultat, polaganim kontroliranim ritmom koji je karakterističan za sve istraživačke projekte. Kako bi se provelo ovo istraživanje, nije potreban mikroskop. Neki smatraju da istraživanje podrazumijeva gledanje kroz mikroskop, poput Pasteura. Oni, ustvari velika većina našeg društva, možda bi i prihvatili ideju da su arhitekti istraživači kada bi nas vidjeli da svoje projekte proučavamo nadvišeni nad mikroskop. Tim mudrim sinovima sionskim trebalo bi odgovoriti poput španjolskog slikara koji je onima koji su ga pitali što slika rekao: *Ako bude imao bradu, sv. Antuna, ako ne, Bezgrešno začće!* Kako mudre mogu biti takve izreke! I kako neuko naše društvo!

PROJEKTIRANJE: ŠTO NIJE? Arhitektonski projekti nipošto nisu puka formalizacija pametnih ideja ili rezultat

Designing requires research. How could it be anything else? Searching, testing, exploring, finding. In short, studying the problems thoroughly to come up with the best solution with all the time and dedication needed to reach the best possible result at a slow, deliberate pace characteristic of all research projects.

And to carry out this research project you do not need a microscope. There are those who think that to be a researcher you have to be looking through a microscope, just like Pasteur himself. They – and indeed much of our present-day society – might

accept that architects are researchers if they were to see us working on our project designs under a microscope. For to these wise men of Zion, as a Spanish painter once replied when asked what he was painting: *if it ends up with a beard then it will be Saint Anthony, and if not, the Immaculate Conception!* How wise such sayings can be sometimes! And how ignorant our present-day society!



PROJECT DESIGN: WHAT IS IT NOT? Design projects are everything except more formalised bright idea or the result of chance.

In a well-known fable by Spanish writer Tomás de Iriarte, an ass plays the flute quite by chance.

Passing my abode, some fields adjoining me, a big ass on his road came accidentally.

And laid upon the spot, a flute he chanced to see, some shepherd had forgot there accidentally. The animal in front to scan it nigh came he, and snuffing loud as wont, blew accidentally.

The air it chanced around, the pipe went passing free and thus the flute a sound gave accidentally. 'O then,' exclaimed the ass, 'I know to play it fine; and who for bad shall class this music asinine?' Without the rules of art, even asses, we agree, may once succeed in part, thus accidentally.

I think this fable summarizes extremely well much of what I want to say here. For indeed, what turns the ass into a flautist is not the act of playing music or designing. Many an architect is capable of playing the flute that makes a sound by chance. In the same way that composing or performing music is something wonderful but complex, designing and building architecture is perhaps still more complex and wonderful.

slučajnosti. U poznatoj basni španjolskog pisca Tomása de Iriarte, magarac svira frulu potpuno slučajno.

Prolazeći pored moje kuće, Kroz obližnja polja, Veliko magare po cesti skakuće, Došavši slučajno. I tamo ostavljen na tom mjestu, Vidi on frulu, Koji zaboraviše neki pastir uz cestu, Tamo slučajno. Približi se životinja ta, Da ju pomiriše izbliza, I puhne u nju glasno, Posve slučajno. Okolni zrak, Kroz frulu prođe lagano, Te se frula stoga, Oglasi slučajno. 'Oh!' uzvikne magare, 'Kako lijepo mogu svirati; A neki bi rekli da je loša, Ova moja glazba magareća.' Bez pravila umjetnosti, Čak i magarci, složismo se, Mogu jedanput donekle uspjeti, Sasvim slučajno.

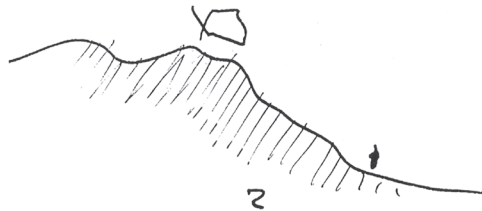
Ova basna jako dobro sažima mnogo toga što ovdje želim reći. Zaista, ono što magarca pretvara u svirača frule nije činjenica stvaranja glazbe. Mnogo arhitekata može svirati frulu koja slučajno proizvede zvuk. Isto kao što je skladanje ili sviranje nešto čudesno, ali složeno, projektiranje



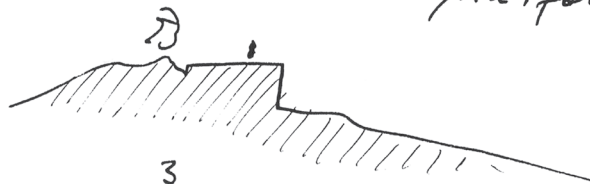
Kuća De Blas, Madrid, Španjolska

De Blas House, Madrid, Spain

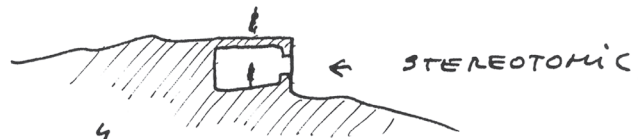
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mountain + tree



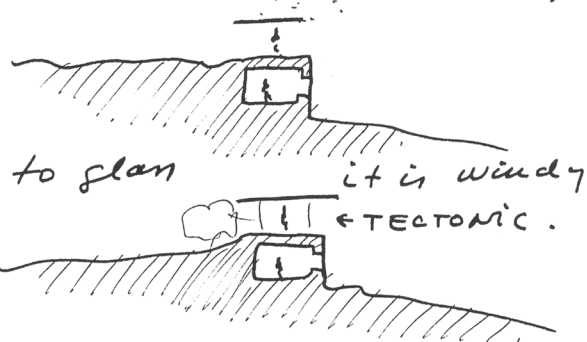
2
to establish a platform



3
to carve to house hot cold



4
to cover it is rainy



steretomic + tectonic =
= ARCHITECTURE.

DE BLAS HOUSE
with R. del V.

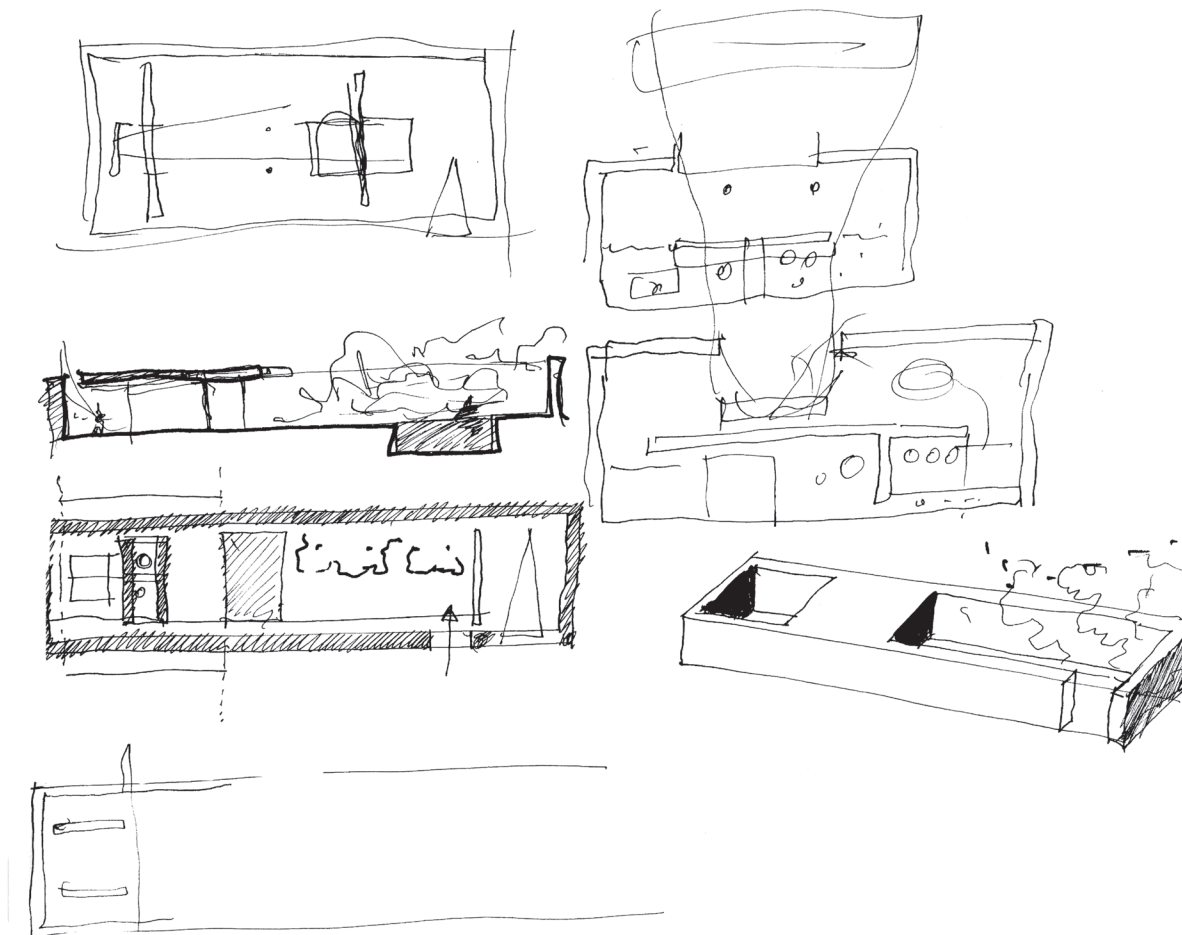
my
January 16 1999.

Kuća De Blas, Madrid, ►
Španjolska

De Blas House,
Madrid, Spain

Cádiz October 11. 1994.

PAGO-MELILLA⁵



Kuća u Pago Melilli,
Cádiz, Španjolska

House in Pago
Melilla, Cádiz, Spain

You have to listen carefully to your clients to know what they want. If their wishes are reasonable, as they usually are, you have to try to translate them into the best possible design. And if what they want goes against nature, you have to convince them that this doesn't make sense because the client is not always right, at least as far as architecture is concerned.

It's like the patient who, on receiving his doctor's diagnosis, questions its merits or failings and puts forward his own bright ideas, *because, you know, doctor, I know myself better than anyone*. I, personally, try to do everything that my doctor tells me. And I'm doing very well.

Some think that project design is a democratic act. And they are wrong. An architect should listen carefully, very carefully, to what the patient has to say, but after that, it's the architect's job to diagnose. It's not the client's job to design.

Nor is design what some architects do, putting down on paper the first thing that occurs to them. Because they believe that they know all they need to, they put down the first solution that comes to mind. And that's how it turns out. That is not project design, much less research.

Other architects think that to design well you have to follow the latest trends. And after soaking up all the most fashionable magazines, they try to

i gradnja arhitekture možda su još složeniji i čudesniji. Podrazumijevaju pažljivo slušanje klijenata kako bismo saznali što žele. Ako su im želje razumne, kao što uglavnom jesu, treba ih provesti u najbolji mogući projekt, a ako je ono što žele protuprirodno, treba ih uvjeriti da to nema smisla. Klijent nije uvijek u pravu, barem je tako u arhitekturi. To je poput pacijenta, koji, kada mu liječnik saopći dijagnozu, propituje njezinu valjanost ili mane te mu predloži svoje ideje: *Jer ja, znate, doktore, sam znam bolje od ikoga*. Ja, osobno, pokušavam slušati svog liječnika. I prilično se dobro osjećam.

Neki projektiranje smatraju demokratskim činom – i u krivu su. Arhitekt bi trebao jako pažljivo slušati što pacijent ima za reći, ali nakon toga, arhitektov je posao dati dijagnozu. Nije na klijentu da projektira. Nije projektiranje ni ono što čine neki arhitekti – stavljanje na papir prve stvari koja im padne na pamet. Misleći da sve znaju, odlučuju se za prvo rješenje kojeg se sjetite pa ispadne kako ispadne; to nije projektiranje, a još manje istraživanje. Drugi arhitekti misle kako je za dobro projektiranje nužno pratiti posljednje trendove pa, nakon što su upili sve ideje iz najmodernijih časopisa, pokušaju napraviti nešto slično. I zbog toga projekti izgledaju kako izgledaju. Možda bi im, da pročitaju prekrasnu knjigu *Sklonost primitivnomu* (*The Preference for the Primitive*) E. H. Gombricha, mnoge ideje postale jasnije.

ŠTO PODRAZUMIJEVA ISTRAŽIVANJE? Provesti istraživanje ima značenje slično analiziranju, istraživanju ili ispitivanju. Istraživanje se provodi jer je nešto nepoznato i treba naći rješenje. Koncept istraživanja primjenjiv je na različita polja, osobito znanstveno ili povijesno. Čini se, međutim, da je istraživanje rezervirano za uglavnom bradatu sivu eminenciju, koja, nadvijena nad svojim mikroskopima, istražuje materiju koju naše društvo smatra znanstvenom. Kao da arhitektura nije dosegla tu visoku razinu! U rječniku španjolskog jezika Marie Moliner dug je popis bliskoznačnica za glagol *istrazivati*, koje se mogu prevesti

kao: *analizirati, tražiti, ispitivati, tragati, ispitati, popisati, izvidjeti, prikupiti podatke, uplitati se, proučiti, pretresti, iskopati, čeprkati, ispipati, prekopati, staviti pod povećalo, prostudirati. Bliskoznačnice za imenicu istraživanje jesu: analiza, ispitivanje, provjera, traganje, raspitivanje, utvrđivanje, istraga, proučavanje.*

Pjesnici istražuju kada nastoje naći pravu riječ koja će prenijeti zamisao koju žele izraziti u pjesmi i kada je, poštujući zakone versifikacije, s najvećom preciznošću smještaju na pravo mjesto. Oni jako dobro znaju da riječ koja u jednom stihu kaže malo ili ništa, u drugom stihu, na drugoj poziciji, može proizvesti zvuk tisuću Händelovih truba i dirnuti naša srca. Jednaku količinu vremena provedu istražujući i tražeći pravu riječ kao i na smještanje riječi na točno određeno mjesto. Glazbenici istražuju kada, poznavajući eteričnost glazbe, bjesomučno prolaze notnim crtovljem kako bi smislili na koji način rasporediti note da postignu željeni rezultat. Njihovo istraživanje uključuje traženje i pronalazak pravih nota i njihovo smještanje na pravu poziciju. Slikari istražuju kada, znajući što žele naslikati, na platnu crtaju

do something similar. And that's how things turn out the way they do. Perhaps if they all were to read E.H. Gombrich's beautiful book, *The Preference for the Primitive*, it might clarify many of their ideas.

WHAT DOES RESEARCH INVOLVE? To carry out research is synonymous with analysing, investigating or examining. Research is carried out because something is unknown and a solution needs to be found. The concept of research is applicable to different fields, especially scientific or historical.

It would seem however that research is something reserved for the usually bearded, *éminence grise*, standing behind their microscopes, probing into matters that our society considers scientific. As if architecture did not quite reach that high level!

Maria Moliner's dictionary provides us with a long list of synonyms in Spanish for the verb *to research*, which translate as: *to analyse, to investigate, to examine, to seek, to inquire, to trace, to search, to browse, to interfere, to scrutinize, to rummage, to dig out, to probe, to sound out, to explore, to stir up, to study*. And the synonyms for the word *research* as a noun are: *analysis, inquiry, examination, search, exploration, inquisition, inquest, study*.

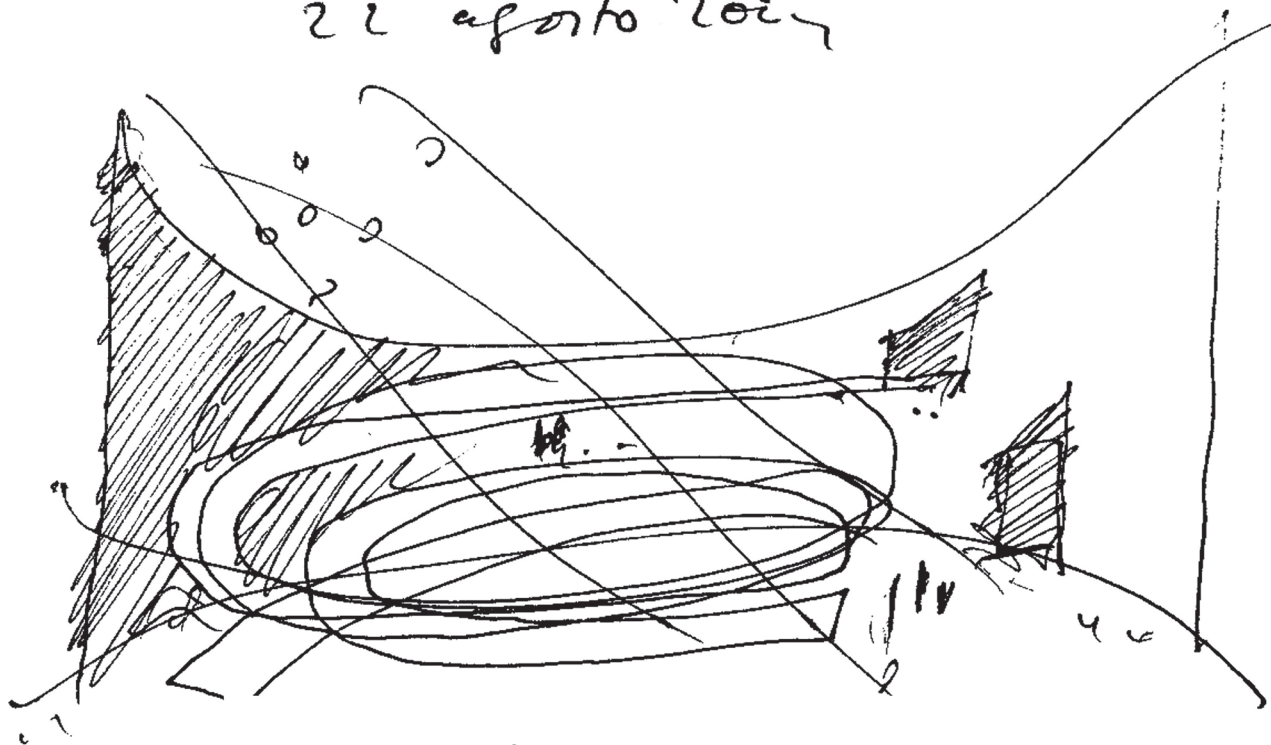
Poets do their research when striving to come up with the precise word to translate the idea they want to express in a poem and for the sake of metrics, as well as placing a word with the greatest precision in the exact right place. And they are well aware that a word that in one line says little or nothing is capable of producing the sound of a thousand Handelian trumpets and stirring our hearts in a different, in another position. They spend as much time researching, seeking out and finding the word, as in placing it in the precise place.

Musicians do their research when, knowing the ethereal nature of music, they forage between the lines of sheet

Andaluzijski muzej
sjećanja, Granada,
Španjolska

Andalucia's Museum
of Memory, Granada,
Spain

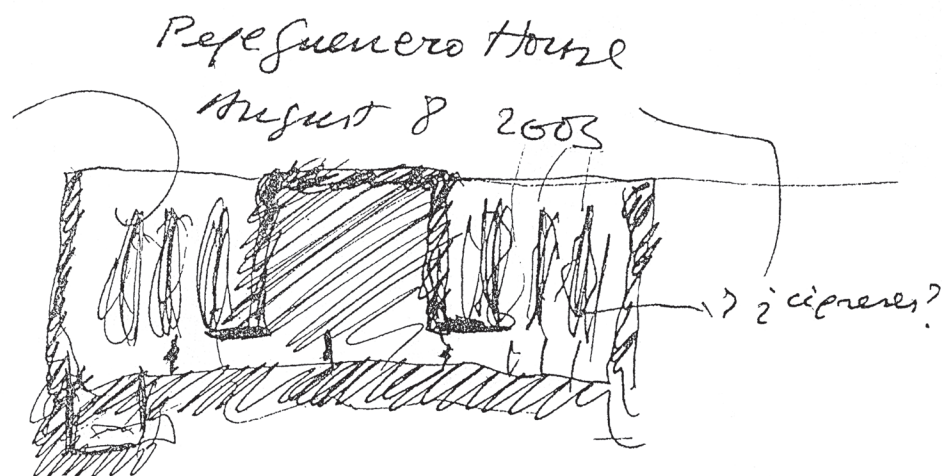
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CAA

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skicu koja odražava temu koju kasnije razrađuju u slici, što dovodi do uspješnog rezultata koji oduševljava autore i nadilazi ih. Stvaraoci, svi stvaraoci, istražuju kada neu-morno rade na svojim djelima svakoga dana, s uvjerenjem da će ih njihova djela jednom nadići, kao što je to dobro rekao moj prijatelj Stefan Zweig. Ali ni pjesnik ni glazbenik ni slikar, kao ni gotovo ijedan drugi autor, ne mora se boriti sa zakonima gravitacije kao što to moraju arhitekti. Djela pjesnika, glazbenika ili slikara ne mogu se srušiti. Također, za razliku od arhitekata, oni ne stvaraju iz nužde. Arhitekti istražuju kada, nakon analize svih uvjeta i zahtjeva novog projekta, postupno otkrivaju ideju koja

music to devise a way of placing the notes to achieve the intended result. Their research involves both seeking and finding the notes, and placing them in the right place.

Painters do their research when, knowing what they want to paint, they draw a sketch on the canvas that reflects the theme that is later covered over with the painting, resulting in a successful outcome, astonishing their very authors and capable of transcending them.

Creators, all creators, do their research when they work tirelessly on their creations every day, every single day, with the conviction that their creation will one day transcend them, as indicated so well by my friend Stefan Zweig.

But neither the poet nor the musician nor the painter, nor almost any other creator has to fight against the laws of gravity as architects do. Neither can the works of poets, musicians or painters fall down. Nor, like architects, do they create for reasons of necessity.



Kuća Guerrero, Cádiz,
Španjolska

Guerrero House,
Cádiz, Spain

na sve može pružiti odgovor. Njihovo je istraživanje i tražanje za idejom jednako mukotrpno kao i razvijanje i realizacija ideje. Ono uključuje istraživanje mjesta (*locus*), sa svim fizičkim i povijesnim aspektima. Ispituje i analizira funkciju koju treba razviti i samu realizaciju, kao i sve aspekte povezane s estetikom i ljepotom. U ovako golemom i kompleksnom istraživanju kao što je arhitektonska praksa, arhitekti moraju odgovoriti na mnogo različitih pitanja: što žele postići u odnosu na funkciju; kako to žele postići u odnosu na izgradnju; kada to žele postići u odnosu na tehnologiju svog vremena; za koga stvaraju u odnosu na financijske mogućnosti i posebnosti klijenta; gdje će se njihov rad realizirati u smislu mjesta (*locus*) te zbog čega se realizira. Sve su to pitanja na koja se može odgovoriti s puno različitih odgovora. Čini se da smo slijedili sedam Kvintilijanovih pitanja: *quis, quid, ubi, quibus auxiliis, cur, quomodo, quando* (*tko, što, gdje, pomoću čega, zašto, kako, kada*). Kvintilijanova pitanja slična su pitanjima koja se često koriste u novinarstvu: *Što? Kako? Kada? Tko? Gdje? Zašto?*, kao koncept koji se koristi u pisanju i izvještavanju, ali čini i osnovnu formulu za skupljanje podataka, rješavanje problema i znanstveno istraživanje.

Architects carry out research when, after analysing all the conditions and the requirements of a new project, they gradually unveil an idea capable of responding to them all. Their research into seeking out and finding the idea is just as painstaking as the development and the construction of that idea. It involves investigating and exploring the place, the *locus*, in its physical and its historical aspects. It examines and analyses the function to be developed and the construction itself, as well as the aspects related to aesthetics and beauty.

And in this vast and complex research that is architectural practice, architects must attend to many different questions: what they want to achieve in relation to the function; how they want to do it in relation to the construction; when they want to do it in relation to the technology of their time; for whom it is being done in relation to the finances and the idiosyncrasy of the client; where it is going to be done in terms of the place, the *locus*; and why it is being done – all of that is open to numerous and very diverse answers. It would seem that we have closely followed the seven questions of the Quintilian Hexameter: *quis, quid, ubi, quibus auxiliis, cur, quomodo, quando*. [*quis* = who; *quid* = what; *ubi* = where; *quibus auxiliis* = by what means; *cur* = why; *quomodo* = how; *quando* = when.].

Quintilian's questions are similar to the famous *Ws* often quoted in journalism: *What? How? When? Who? Where? Why?* The *six Ws*, also known as the *five Ws and one H*, is a concept used in writing and news stories, but also constitutes a basic formula in information gathering, problem solving and scientific research.

Perhaps the simple achievement of *Utilitas, Firmitas* and *Venustas* proposed by Vitruvius, may constitute a more

appropriate response to these questions, not forgetting that Gravity Builds Space and Light Builds Time.

THE IDEA AS A RESULT OF THE FIRST STAGE OF RESEARCH. Just like a medical analysis, an architect should carefully study the symptoms of the project in order to be aware of all the circumstances involved so as to come up with the most accurate diagnosis, which is what we understand as the project concept. We have already explained this sufficiently.

The idea is like a distillation that needs time, like a good wine. Time for research. As the classics would say, if the idea is clear and distinct, everything will go smoothly.

RESEARCHING THE LOCUS. When studying the site on which to build, whether in a natural or historic city setting, the architect carries out a great deal of research on the *locus*. The *locus* includes everything from topography

to landscape, from climate to history.

On my desk at the moment, I have the project of a house perched high on a rocky ridge facing the Atlantic Ocean. I can assure you that, in addition to the obligatory on-site visits to this beautiful spot, we have not only drawn but already produced several topography models in different scales, in order to better understand the site. Investigating, looking for the vestiges of the layout that the site indicates to us.

Analysing the surrounding landscape, to know where and

Dječji vrtić Benetton, ►
Ponzano Veneto,
Treviso, Italija

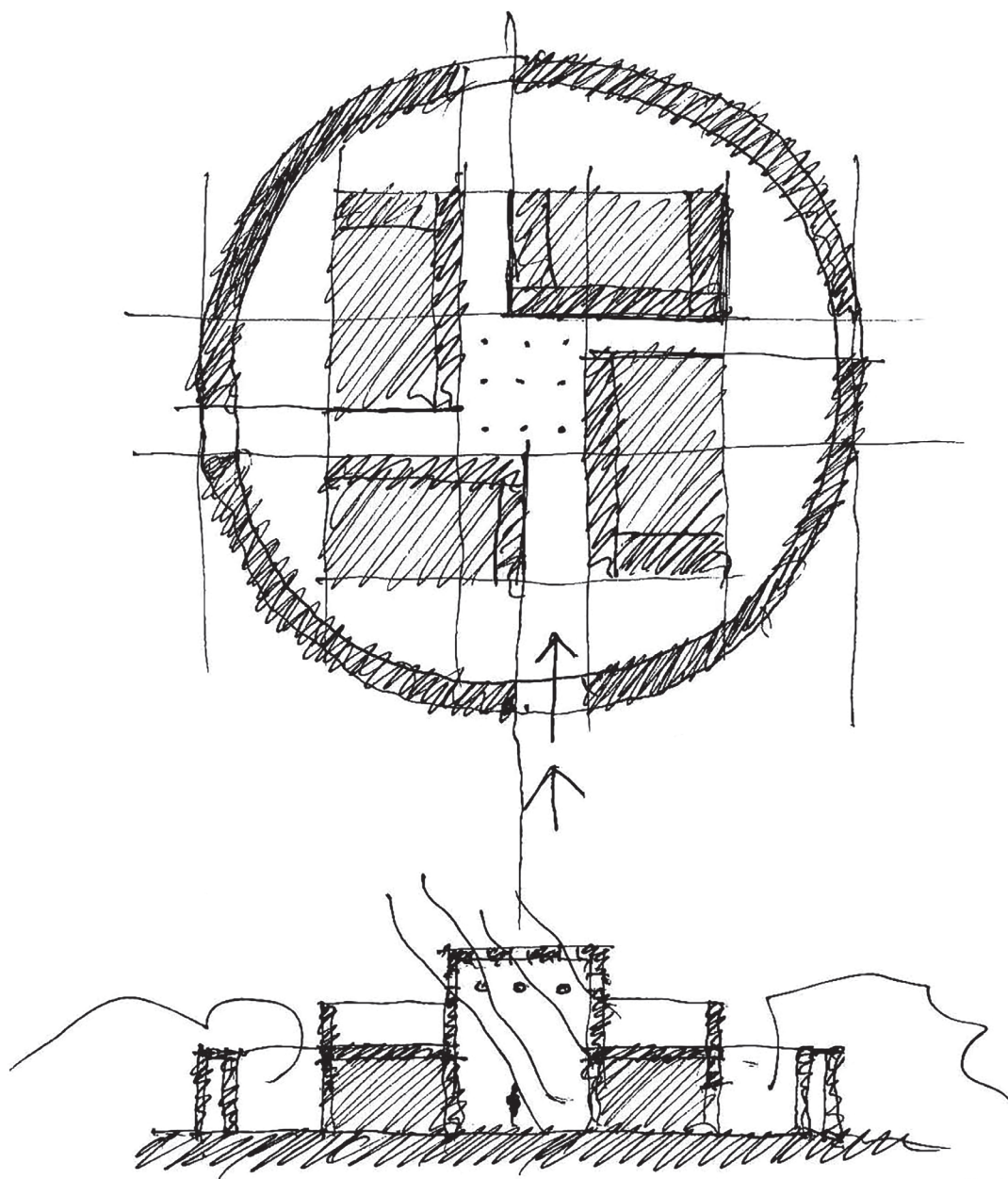
Benetton
Kindergarten,
Ponzano Veneto,
Treviso, Italy

Možda bi postizanje Vitruvijeve kategorije *korisnosti, čvrstoće i ljepote* pružilo prikladniji odgovor na ova pitanja, s tim da ne bismo smjeli smetnuti s uma da gravitacija gradi prostor, a svjetlo gradi vrijeme.

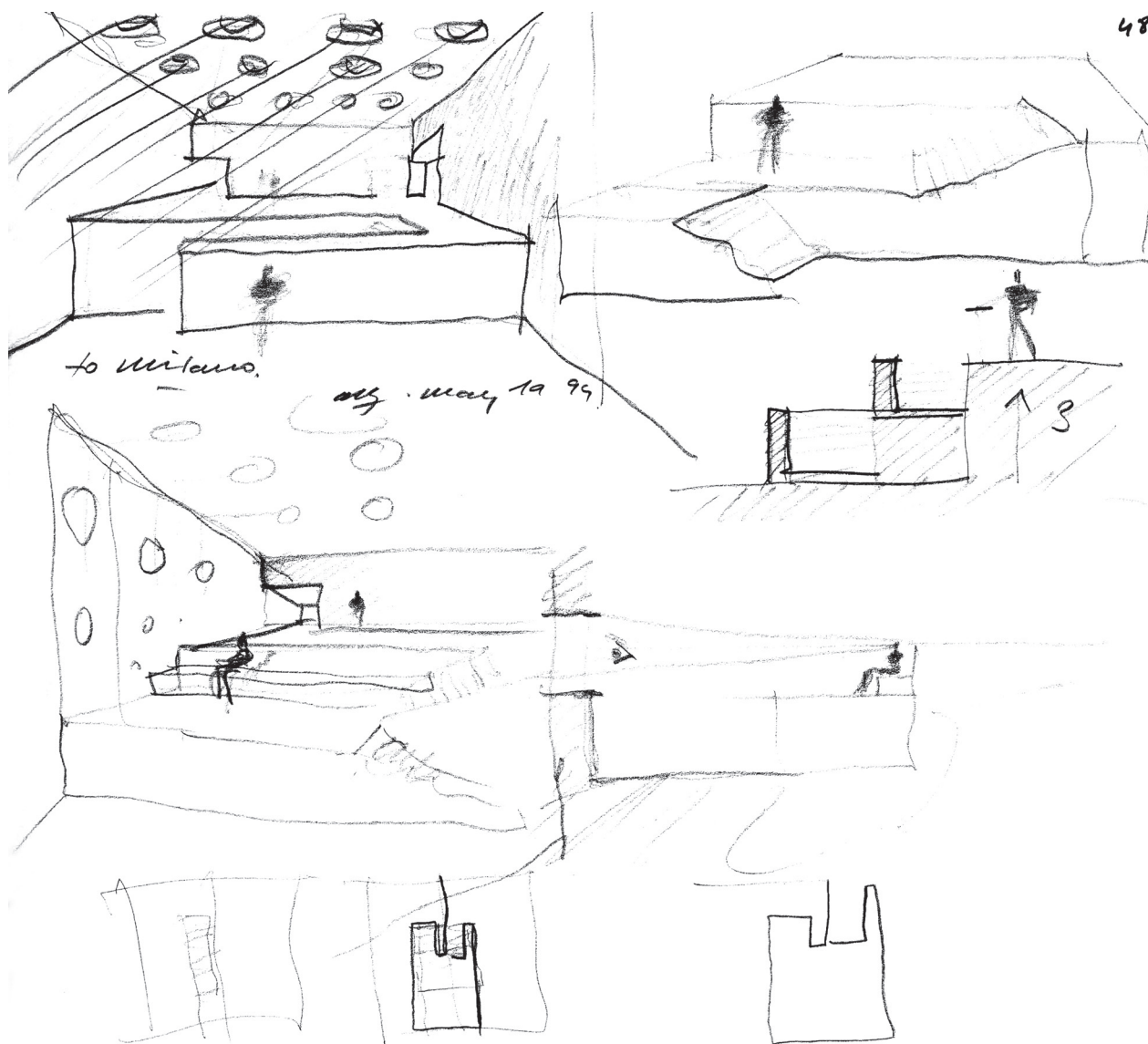
IDEJA KAO REZULTAT PRVE FAZE ISTRAŽIVANJA. Poput medicinskog stručnjaka, arhitekt treba pažljivo proučavati simptome projekta kako bi bio svjestan svih okolnosti i postavio najprecizniju dijagnozu koju mi razumijemo kao koncept projekta. Dovoljno smo o tome govorili. Ideji je, poput dobrog vina, potrebna destilacija – vrijeme za istraživanje. Kao što bi rekli klasici, ako je ideja jasna i precizna, sve će proteći glatko.

ISTRAŽIVANJE MJESTA (LOCUS). Kada se proučava mjesto na kojem će se graditi, bila to priroda ili povijesni grad, arhitekt posvećuje velik dio svoga istraživanja mjestu (*locus*), koje uključuje sve – od topografije do krajolika, od klime do povijesti.

Trenutno je na mom stolu projekt kuće položene visoko na stjenovitom grebenu koja gleda na Atlantski ocean. Uvjeravam vas da smo, uz obvezne posjete ovoj predivnoj lokaciji, ne samo nacrtali, već i izradili nekoliko topografskih modela u različitim mjerilima kako bismo bolje razumjeli lokaciju. Istraživali smo i tražili tragove prostornog rasporeda koje nam sugerira lokacija. Analizirajući okolni krajolik utvrđujemo gdje će i kako kuća biti položena, kako bi ga naglasila i uokvirila. Proučavamo klimatske uvjete kako bismo odlučili koja vrsta arhitekture najbolje odgovara uvjetima. Upoznajemo povijest mjesta kako bismo naučili što su drugi radili prije nas i tako izbjegli ponavljanja. Sve to podrazumijeva istraživački pothvat s ciljem temeljitog informiranja i upoznavanja s lokacijom kako



Ardo Nido a Ponza
masso 2002



Zgrada Banke Caja
Granada, Granada,
Španjolska

Caja Granada bank,
Granada, Spain

◀ Kulturni centar u
Loechesu, Madrid,
Španjolska

Cultural Centre in
Loeches, Madrid,
Spain

bismo donijeli dijagnozu na temelju najveće mudrosti kojom raspolazemo. Onima koji nisu arhitekti nikada nije bilo lako razumjeti ogromnu važnost smještanja arhitekture na lokaciju. To zaista jest jako važno.

ISTRAŽIVANJE FUNKCIJE (UTILITAS). Nakon dubinske analize programa, kada se nazire prva ideja rasporeda prostora na način da su tražene funkcije dobro raspoređene i artikulirane, raspored funkcija i cirkulacijskih tokova nije tako očit kao što bi se to moglo činiti. Za određivanje veličine, organizaciju i povezivanje svih traženih funkcija, također je potrebno istraživanje.

ISTRAŽIVANJE KONSTRUKCIJE I GRADNJE (FIRMITAS). Kada radimo na konstrukciji, kosturu zgrade, moramo imati na umu da konstrukcija utvrđuje raspored prostora, gradi prostor. Arhitektonski prijenos prostora implicira apsolutnu kontrolu nad konstrukcijom putem preciznog izračuna kako bi se mogla jamčiti stabilnost građevine i stabilnost njezina otpora. Arhitekti pritom koriste proračunske tablice. Znajući da ne postoji samo jedna moguća konstrukcija za svaki projekt, arhitekt i ovdje provodi istraživanje. Kada je Norman Foster projektirao Hearst Tower u njujorškoj četvrti Columbus Circle, istraživao je i odlučio izgraditi fasadnu konstrukciju nevjerojatne logike.

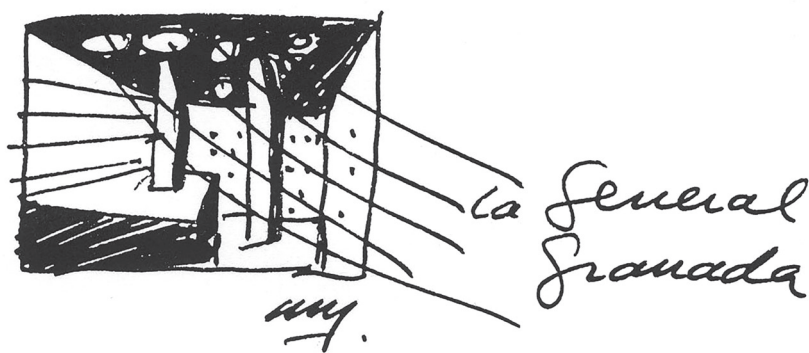
how the house will be facing, focusing it, underlining it and framing it.

Studying the climate of the place to decide on the type of architecture that best responds to the prevailing conditions.

Knowing the history of the place. Knowing what others have done before us to avoid replicating what others have done.

All of this is a research exercise to inform ourselves thoroughly and become fully acquainted with the site to produce a diagnosis based on the greatest wisdom that we are able to summon up. It has never been easy for non-architects to understand the huge importance of the placement of architecture on a site. It truly is of extreme importance.

RESEARCH ON THE FUNCTION, [UTILITAS]. Following an in-depth analysis of the programme, when the first idea of what determines the spaces, so that the requested functions are well ordered and articulated begins to emerge. The arrangement of functions and circulation flows are not as obvious as it might seem.



Renzo Piano i Richard Rogers proveli su istraživanje kada su gradili Centar Pompidou u Parizu, čiji je glavni protagonist konstrukcija.

Htio bih spomenuti vlastiti primjer. Za potrebe projekta za Paviljon sportskog centra Sveučilišta Francisco de Vitoria, proučavali smo niz različitih varijanti konstrukcije; istražujući, pokušavajući naći najjednostavnije rješenje – najlogičnije i najekonomičnije. Nakon brojnih radnih sastanaka s Andresom Rubijom, suradnikom statičarem te Ignacijom Aguirreom, glavnim suradnikom na projektu, odlučili smo se za jednostavne rešetke koje smo kasnije ugradili. Kada radimo s materijalima, također se bavimo istraživanjem proučavajući ih: kamen, beton, drvo, čelik i staklo, ali i grafen ili ETFE ili konstrukcijski silikon.

ISTRAŽIVANJE LJEPOTE

[VENUSTAS]. *Oh, Venustas! Oh, ljepoto, kako li je doseći!*

Znam da nije lako razumjeti kako se može istraživati nešto što se čini tako eteričnim – premda nije – poput ljepote. Svi autori na svijetu služili su se istraživanjem u potrazi za ljepotom. Ranije smo naveli kako je sve u arhitekturi forma, neizbježna forma. Upravo ta forma oblikuje nosivu konstrukciju i uspostavlja red prostora koji na ovaj ili onaj način vodi

Because, that very sizing, organizing and connecting of each of the requested functions, is also research.

RESEARCH ON THE STRUCTURE AND THE CONSTRUCTION, [FIRMITAS]. When working on a structure, the skeleton of the building, we must always understand that the structure establishes the order of space; it builds the space.

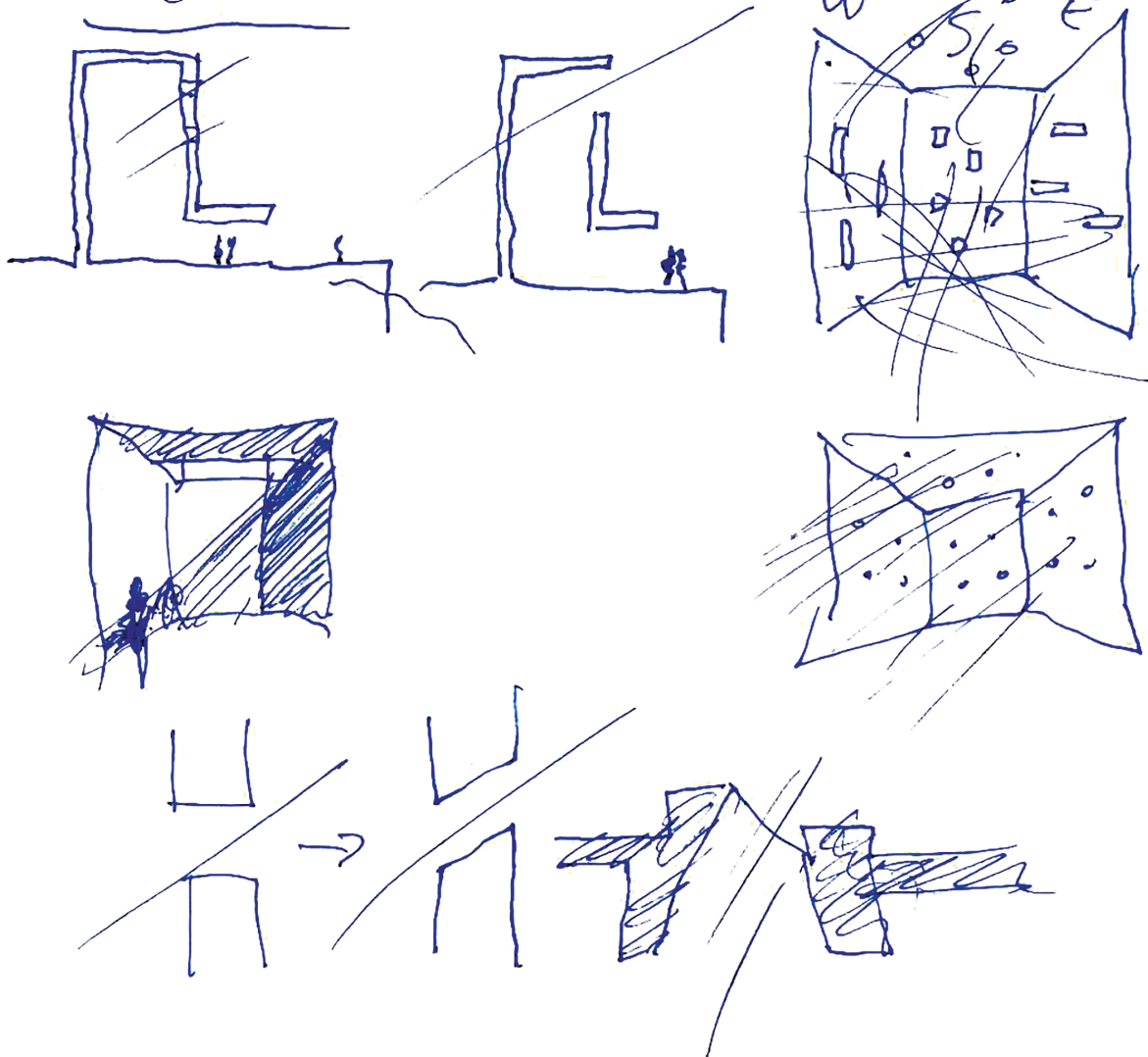
The architectural translation of the space involves the absolute control of the structure through its precise calculation to guarantee the stability of the work, to guarantee the security of its resistance. For this the architect uses calculation tables which are put to good use. And knowing that there is not just one possible structure for each work, the architect pursues a great amount of research here.

Norman Foster, when designing the Hearst Tower at Columbus Circle in New York, did his research and decided to build a façade structure of overwhelming logic. Renzo Piano and Richard Rogers carried out their research when they constructed the Pompidou Centre in Paris, where the structure is the main protagonist.

Here I'd like to allude to a personal example. In the context of the project for the Pavilion Sports Centre for the Francisco de Vitoria University we studied a variety of structural alternatives, researching, seeking to find the simplest solution: the most logical and the most economical. After numerous work sessions with Andres Rubio, the architect with whom I calculate the structures of my works, and with Ignacio Aguirre, my main collaborator on that project, we finally came up with the solution of the simple trusses that were later built and placed there.

And when we work with materials we are also involved in research; investigating materials: stone, concrete, wood, steel and glass, but also graphene or ETFE and structural silicone.

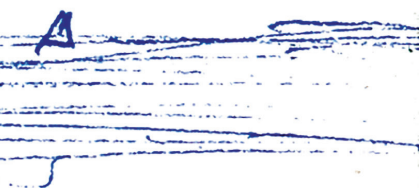
JKOURA ^{tablo} 5 de Julio de 2008



Hotel, Marrakech,
Maroko

Hotel, Marrakech,
Morroco





▲
House of the Infinite,
Cádiz, Španjolska
House of the Infinite,
Cádiz, Spain

ljepoti. Mies van der Rohe svoje je istraživanje forme predstavio kada je uveo rješenje oštih kutova u tlocrtu zgrade Friedrichstrasse, kako bi se postigla perspektivna transparentnost te, iz sličnih razloga, u prekrasnom neizgrađenom projektu Glass Tower. U ovom kontekstu prikladno je spomenuti kako je u Kući Cala, koju nazivamo *Kućom Raumplan* zbog njezine prostorne prilagodljivosti, raspored prostora rezultat vježbe projektnog istraživanja. Povezivanje prostora dvostruke visine u jednostavan uzlazni spiralni pokret proizvodi nevjerojatno učinkovite rezultate. Kako bismo to uspjeli postići, bavili smo se opsežnim istraživačkim radom koji je uključivao izradu bezbrojnih nacрта, tlocrta i maketa.

ISTRAŽIVANJE SVJETLA I TAME. Ako postoji jedan središnji materijal u arhitekturi, onda je to svjetlo; svjetlo koje gradi vrijeme. Kada ljudi o meni govore kao o arhitektu svjetla, što se često događa, odgovorim kako ni ja ni itko drugi ne može prisvojiti taj privilegij. Svjetlo je tema

RESEARCH ON BEAUTY, [VENUSTAS]. *But, oh, Venustas! Oh Beauty, how to reach her?*

I know it is not easy to understand how one can actually carry out research into something that seems so ethereal – even though it is not – as beauty. All the creators in the world have employed research in the pursuit of seeking and finding beauty.

We pointed out earlier how everything in architecture is form, that inescapable form. And it is that form that shapes the load-bearing suspension in the air and establishes the order of space that one way or another leads us towards beauty.

Mies van der Rohe did his research into form when he introduced the solution of acute angles in his Friedrichstrasse building, on account of the visible perspective transparency and for similar reasons in his beautiful unbuilt Glass Tower. In this context, it is appropriate to speak of how in my Cala house, which we call *Raumplan house*, because of its spatial conformation, the reason for the used arrangement of spaces, is a pure exercise of project research. The simple concatenation of double-height spaces in a simple ascending helical movement produces spatial effects that are enormously effective. To achieve this, we did substantial research work involving countless drawings, plans and models.

RESEARCH ON LIGHT AND TIME. If there is one central material in architecture, it is light: light that builds time. When people speak of me as the architect of light, as has happened over and over again, I have always answered that neither I nor anyone else can take ownership of that prerogative. Light is a theme of architecture itself. As a friend of mine said: *architectura sine luce nulla architectura est*.

In an attempt to explain how that control of light, far from being something intuitive, is a question that requires great precision, I invented the existence of light tables, tables for calculating light just like the structural calculation tables

same arhitekture. Kao što je rekao jedan moj prijatelj: *architectura sine luce nulla architectura est*. U pokušaju da pokažem kako je kontrola svjetla daleko od nečeg intuitivnog i pitanje koje zahtijeva veliku preciznost, izmislio sam tablice za izračun svjetla, po uzoru na tablice za proračun konstrukcije koje svi koristimo. Raditi sa svjetlom pravi je istraživački rad, možda najspecifičniji istraživački rad u arhitekturi. Svjetlo koje gradi fizičko vrijeme, ali i drugo vrijeme, *distentio animis*, koje nam pokazuje sposobnost svjetla da zaustavi vrijeme u arhitektonskom prostoru.

POUČAVANJE KAO ISTRAŽIVANJE. I tako konačno dolazimo do prenošenja arhitektonskog projektiranja; poučavanja projektiranja na arhitektonskim fakultetima koje također jest i trebalo bi biti istraživački rad. Oni koji predaju znaju da više naučimo nego što poučimo. Poučavanje projektiranja kao temeljnog uzroka također je pravi istraživački rad. Profesor projektiranja koji provodi istraživanje svakodnevno u vlastitoj praksi ne može nego nastaviti u istom duhu kada poučava. Poučavanje nije samo prenošenje rezultata projektantskog rada, već je samo po sebi istraživački rad. Mnoga pitanja koja profesori svakodnevno postavljaju u svom nastavničkom radu rješavaju u svojim arhitektonskim uredima tijekom procesa projektiranja. I obrnuto: neka od pitanja koja arhitekti postavljaju u svojim uredima rješavaju se u svakodnevnom poučavateljskom radu. Upravo zbog toga uvijek savjetujem svojim najboljim studentima da ostanu u nastavničkoj praksi

that we all use. Because working with light is a true work of research, perhaps the most specific research work in architecture.

Light that builds physical time, but also builds that other time, the *distentio animis*, which leads us to the

capacity of light to make time stand still, to suspend it in an architectural space.

TEACHING AS A RESEARCH PROJECT. And so we finally come to the transmission of project design, to the teaching of architectural design in Schools of Architecture, which is also, and should be, a work of research. Those of us who teach know that we learn more than we teach.

Teaching project design in architecture on account of its root cause also becomes a real work of research.

A professor in charge of project design who carries out research on a daily basis in his own work, in his architectural practice, can only operate in the same spirit when he teaches. Teaching is not a mere transmission of the results of the designing activity, but is in itself an activity of research.

Many of the questions raised by educators in their daily lives as teachers in a school are resolved in their studios when they are designing. And *vice versa*: some of the questions that architects pose in their studios are resolved in their everyday teaching work.



Katedralni trg,
Almería, Španjolska
Cathedral Square,
Almería, Spain

kada diplomiraju. Profesor ima privilegirani položaj za stvaranje najbolje moguće arhitekture i razvijanje uloge istraživača. Projektiranje i poučavanje, poučavanje i projektiranje postaju neodvojive radnje koje se međusobno nadopunjuju; dvije strane novčića u kontekstu projektnog istraživanja. Poznato je da dobri arhitekti – najbolji ustvari – ako se prihvate poučavanja, ne mogu ne biti uključeni u istraživački proces u svom projektiranju i poučavanju. Uvijek sam snažno zagovarao ravnotežu između poučavanja i građenja kao cilj u arhitektonskoj profesiji. Kada sam 1986. trebao predstaviti istraživački rad za kandidaturu voditelja Katedre za projektiranje na Arhitektonskom fakultetu u Madridu, predstavio sam stvarni projekt, knjižnicu Orihuela koja je tada bila u procesu izgradnje. Već tada, u tom opsežnom dokumentu, snažno sam zagovarao ideju projektiranja kao istraživačkog procesa.

ZAKLJUČAK. Kroz brojne navedene primjere pokušao sam pokazati kako su arhitektonsko projektiranje, koje nazivamo arhitektonskom praksom, i njegovo prenošenje poučavanjem pravi istraživački rad koji zahtijeva značajan duh tako dobro opisan u riječima sv. Augustina: *Tražimo kao oni koji će naći i tako pronadimo kao oni koji će istraživati.* I tako, zaista, arhitektonski projekt plod je istraživanja.

That is why I always advise my best students to stay in teaching when they graduate. Being a teacher provides a privileged position for producing the best possible architecture, for developing the role of researcher. Designing and teaching, teaching and designing become inseparable actions that mutually benefit one another. They are the two sides of the coin in the context of project research.

It is acknowledged that good architects – the best – if they take up teaching, cannot fail to be involved in research in their projects and their teaching. I have always stoutly defended that desirable balance for an architect between teaching and constructing.

Back in 1986, when I had to present a research project for my candidature for the Chair of Design at the School of Architecture in Madrid, I presented a real project, that of the Orihuela Library, which was under construction at the time. And in that thick document, I already put forward quite an outspoken defence of the architectural project as a research project.

CONCLUSION. I have endeavoured to demonstrate through the countless reasons outlined here, that project design in architecture, what we call architectural practice, and its transmission through teaching, constitute a real work of research requiring an investigative spirit so well described in the words of St. Augustine: *Let us seek as those seek who have not yet found, and find as those find who are yet to seek.* And so it is, truly, that an architectural project is a labour of research.

Zgrada Banke Caja ►
Granada, Granada,
Španjolska
Caja Granada Bank,
Granada, Spain

