THE INTEGRAL ROLE OF CONVENTIONAL SKETCHING IN CONCEPTUALISATION

Professor Andrew Macmillan - Mustafa M. Mezouhi

The Mackintosh School of Architecture, Glasgow School of Art, University of Glasgow,
Glasgow, 177 Renfrew Street, G3 6RQ

ABSTRACT

Architectural Design Studies is an expanding research area, which recently has experienced dramatic shifts in approach. The successful application of computing to architectural practice has created pressure leading to a rediscovery of Architectural Drawing. The thrust of recent design studies is toward the early stages of the design process, where the modes of conception, human perceptual, and cognitive systems are the focus. In this paper we endeavour to examine the integral role of sketching in conceptualisation. A modelling technique relating to both the design and the graphic process 'sheds light' on the interaction between thought and drawing. Data from a protocol analysis is tested within the framework of the proposed model.

1.0 MODELLING THE DESIGN PROTOCOL:

As the aim is to investigate the 'conceptual association' that marks the creative process of architectural design, this paper adopts 'Protocol Analysis' as a framework for the examination of interaction between thinking and drawing (sketching). The method is based on data generated from the documented process of the protocol, i.e. the analysis of design protocol data at the time of designing. This examination is guided by a proposed descriptive model of the process, Figure (1). This model builds upon Akin's model of 'Information and Control Flow between the Cognitive Mechanisms of Design' (Akin, 1978). It is also suggests an 'association' between the modes of conception and sketching (Goldschmidt, 1992).

The segmentation of the process derives from the three major moves within the process: solution-generation, solution-integration, and solution-evaluation. These three categories identify the behaviour of the designer within the process where the departure point is 'abstract' and the destination is a 'concrete design'. In addition, the model represents the two modes of 'conception' and 'sketching' involved in the design process.

It can be argued that the cognitive design process occurring inside a designer's head, cannot be directly observed. However, this process is represented in the proposed model as a 'passive' intangible activity, interpreted only from the dialogue of the designer throughout the process of designing as 'thinking aloud'. Sketching as a tangible responding medium is represented in the model as an 'active' activity.
In each segment of the process, as illustrated in figure(1), both components or modes are facilitating: First, conceptually; the designer begins by generating design elements, acquiring information and retrieving previous designs. This mental activity is accompanied by figurative representations within which the conceptual mode can be seen to be crystallising, i.e. the sketch is a positive image of conceptualising. Secondly, within the second segment of the process, the design problem has been interpreted, and with the allocation of design rules, alternative solutions are produced and integrated. A series of sketches are developed along the span of this segment of the process, marked by the ‘will’ of the designer to ‘form’. The final step is the combination of reasoning and rationalisation, where partial detail studies are generated, moving towards the concretising of the solution.

1.1 Protocol Analysis; an operational model

Sketches and sketching date from the fifteenth century following in the wake of revolutionary advances in paper making. Trial-and-error as an exploring path became possible for both architects and painters. This helped formulate the 'empirical process' of architectural design developed around 1500 AD. which has remained for the next five centuries right up to the present.

Architectural research has made an effort to formulate an operational definition of 'sketching' and its role in the design process. Most studies have been guided by questioning the design process itself. However, today, a significant number have focused on the role of sketching as a process through which the analysis of a task and the proposing of logical structure for the process has taken place.

Design studies within this framework have generally adopted the 'protocol analysis' method of Newell and Simon, (1972), which was intended as a tool for deducing the mechanism of Information Processing System (IPS) that underlies the problem solving behaviour of a designer. Thus, it required that the 'behaviour' can be
traced in a representational form of verbal and graphic protocols, which are recorded on video/audio tapes or sketching on paper.

1.1.1 The Dual Mode of Conception and Sketching

Studies conducted within this operational area, have attempt to establish an operational model for the process. This model, is then tested against empirical data. In her study of the process of sketching, Goldschmidt aims to examine the two questions of, what kind of reasoning does the sketch represent? and why is it so indispensable as a design thinking aid. She argues, that by sketching the designer does not merely represent images held in mind, but creates visual displays which help bring about images of the entity that is being designed (1991: 123).

It can be argued that through the analysis of architectural sketching, it should be possible to understand how a mode of conception might evolve. The analysis of the mental patterns and representational types and media would be based on understanding the nature of the envisioning process. Design studies in this respect, have developed various approaches, most however, have dealt with the two major activities occurring throughout the protocol as two associated modalities involved directly in the process. These modalities have been labelled as 'verbal-conceptual and visual-graphic'; 'speech and graphic'; 'verbalisation and sketching'; 'thinking-aloud and figural-processing'.

1.1.2 System Parsing and Coding Strategy

'Association', as a pattern that illustrates the process of conceptualisation has been examined in many studies, Akin for example, suggests a dual-mode model (Akin: 1994), where a situation for a designer -at time of designing- has been envisioned as a representation through a pair of modalities 'graphics' and 'speech'. The former is seen as a primary activity, whereas the latter is the reflection of the former. For Goldschmidt, the association is represented as a series of arguments, a coded verbalisation in the protocol, according to the words used, that semantically implies either the figural or the conceptual.

To parse the documented process into a set of intervals, is a prerequisite and mandatory step, Figure (2), prior to the analysis of the protocol. Various systematic parsers have been developed for the purpose of analysis. For Eastman (1970), the parser was based on the sequence of design units and manipulation, For Akin (1994), it was the sequence of design decisions, and for Goldschmidt,(1992) the sequence of moves (propositions)

Figure (2): A diagram represents the sequence of architectural conception process.
2.0 EXPERIMENT: 'SWEATBOX' 1

This paper presents a case study based on an experimental session in the Scott Sutherland School of Architecture, The Robert Gordon University, Aberdeen as a pilot investigation, using a video recording one of sessions conducted in this project.

Fifteen subjects had been asked to develop a schematic solution to a specific design task, which is a small living teaching unit on a steep south facing sloping site in the grounds of the Scott Sutherland School of Architecture.

The procedure was not to let the designers see a written brief, but to explain it to them on site. It is reported by the school that the reason was "to help them (designers) to concentrate on the essential issues". The limited given information was found to have provided a better opportunity for a designer to explore as much of the potentialities and limitations of the design problem as possible. It also helped in identifying the constraints along the process, which has obviously influenced the sequence of the design decisions.

Subjects were taken to the site to visit and to examine, for the purpose of experiencing its characteristics. They then were given 30 minutes to develop a solution. For the purpose of this pilot study, we decided to analyse the available recorded case of Professor Andrew Macmillan of the Mackintosh School of Architecture, a partner in the architectural practice Gillespie Kidd and Coia.

2.1 Data

Protocol data have been classified into two broad categories: verbalisation and sketching. These data are parsed into series of intervals determined by 'sketching nodes'. The sketching node as a criterion, has been distinguished through the statements with words used in the designer's verbal responses that semantically imply the forming of decisions, together with the graphic act that represented in the attempt of each new sketching trial.

According to this view, sketching nodes that were expressed verbally have formed that intervals of the protocol. In linking these nodes throughout the protocol, graphic actions may be suggested to be the interconnected processing network that mediates the conceptual association.

2.1.1 Verbalisation:

Verbalisation has been parsed into nodes determined by sketching moves or trials, however, further segmentation of the verbal responses seems to be imperative for the purpose of relating the sketching mode to the conceptual node. Thus, classifying the verbal responses into three major categories of: constraints, retrieval, and conception, provided a representation of the activities and kinds of information employed in the design process.
2.1.2 Sketching

As pointed out previously, sketching as data is parsed into nodes. 'Idea-sketching' is considered as an interactive process of mental and graphic mechanism (Mackim, 1980: 121). It utilises the three human activities of 'seeing', 'imaging', and 'drawing' in a cyclic feed back process that could be fundamentally repetitive. It can be argued that through the analysis of the 'sketches' within a particular framework, it should be possible to understand how a mode of conception might evolve. The analysis of the mental patterns and representation types and media would be based on understanding the nature of visualising process.

As a form of expression, sketching can be seen as an integrated state of perceptual and conceptual thought processing. It is a theme of an 'intrapersonal' level of communication that activates both exploratory and explanatory modes.

3.0 ANALYSIS: IPS as a Model in Problem Solving Behaviour:

'Information Processing System' (Newell and Simon, 1972) represents a mechanism within which man's problem solving behaviour operates. It is based on the polarities of Memory and External Environment, Figure (3), it functions through 'receptors' and 'effectors'. The former gather information from the environment, where the later manipulate the environment. A processor is what mediates between these two functions and memory in which operates on three levels: First, encoding the information provided by receptors. Second, transforming the codes of symbols and their relations. Third, decoding the internal symbols into information to be transmitted to the environment.

![Figure (3): Information-processing system (After: Newell and Simon, 1972: p.20)](image)
3.1 Verbal/Sketching: an associative conceptual-reasoning process

This investigation starts with a hypothesis that defines a relationship between thinking and sketching as an associative relationship where both formulate a unified conceptual process. The conceptual process is then verified within the proposed model as a process determined by the designer's problem solving strategy and tactics as revealed in the associative process.

Dealing with a design problem is dealing with a problem of a complex pattern, therefore, designers tend to establish strategies which provide a framework for design. Newell and Simon have identified basic methods of searching the problem space for a solution, focusing particularly on the 'heuristic search'. Heath (1984) argues that the essence of heuristic search is to make use of information already obtained to guide the remaining stages of the problem solving process. This suggests that the next step is to identify where the actual process of the search in the problem space occurs. It can be argued, that such a search implies another structure, which we may label as tactical. The tactical structure maps a specific solution through a set of operational rules. Problem space is a situation in which a designer can view the task. It mediates between designer's previous experience and task environment or design, Figure (4).
It is therefore, suggested that the ability to solve a design problem depends not only on the strategic structure for framing the problem space but also on how it is represented. Representation in this context can be a propositional mode.

In the conceptual process defined by Heath (1984:122), this propositional mode is an 'external memory' that consists of any physical or recorded analogue of the problem. External memory is an important application in the process of visualisation.

3.1.1 Sketching Segmentation:

The documented graphic process is seen as a series of figural acts, see Figure (5). In parsing the protocol, a node is defined as a coherent proposition that involves the graphic and verbal responses, and represents the associative interaction. Node determination requires a systematic procedure of segmentation based on an inference of the pattern of the developed graphic process.

In decomposing the process, three broad stages that represent the designing activity can be identified: the consideration of the problem, the generation of possible solutions, and the evaluation of solutions should be seen as. As a general idea, this breakdown is shared by most of the design studies, and it is adopted and represented in the proposed model of this study.

Accordingly, we notate the graphic process in sequential order by judging both graphic and verbal responses. The process appears to be in accordance with a framework of the three stages. Identifying points of departure and arrival in each stage is determined by the verbal response that accompanied the 'new' sketch confined by the distinctive graphic act.

Consider the following excerpt from the protocol:

033 - 047: This is a cross section which I think you have to draw, it is an unbelievable cross section, I have seen it and I still don’t believe it.

This statement accompanied designer’s enter upon sketching, it demonstrates the consideration of the problem space.

138 - 141: Can I start with the knoll, some where here in the corner and the idea of trees.

This statement indicates the departure point of the second stage, the generation of possible solution, architecturally expressed as the 'will' of the designer to 'form'.

475 - 499: OK. Let's plan all this. We'll draw it as a square and see what happens [...] and we are going to have column here and this thing [...] So we put guys there, here, there that determines where are is that bit.

This represents the partial solution generation, and it implies the evaluative intention of the proposed solution.

The analytical approach of 'general to specific' may generate further detailed segmentation in each stage. In fact the decomposing process is the key notion in the protocol analysis where an enormous data can be provided. However for the purpose of this paper, the analysis of the graphic input will be limited to its integral role in the conceptualisation process. Accordingly, verifying such integration requires a codifying strategy of the verbal responses, categorised previously as 'constraints', 'retrieval', and 'conception'.
Constraints: As a category of verbalisation, constraints is seen as an important factor in the conceptualisation process. Finke (1990), in his introduction of the 'preinventive form' as a catalyst that mediates between many different problems and solutions that have underlying structure in common, argues that we need to have some constraints in the kind of solutions we are willing to consider. Such restrictions may provide a possibility in interpreting particular conceptual categories within the defined problem space. In our observation, constraints were both given and developed and they occurred in both while making sketching or not. All constraints appear to be indispensable to the designer's thought process, which operates instinctively to identify the limitations of as well as define the problem. Constraints observed in this respect are in the site analysis (potentialities), Structure, Function, Form and Space.

It can be argued that designers generate 'operational rules' for testing design alternatives that are later developed. Obviously in our case, for example, the subject expressed a constraint of the site:

127 - 131: "It is a hell of slope, and you'll have to dig very deep founds"
and in a solution later developed the constraint has become an operational rule for testing the proposition in terms of use when the subject expressed:

184 - 187: "and have a place to sit and talk and be a megalomaniac out on the edge".

It was observed that all expressed constraints became operational, having been expressed before and through solution generation. For the graphically expressed constraints, sketching operates as a testing device.

Retrieval: It is observed that solution often begins with the retrieval of information. Weisberg, for example, suggests, that "the retrieval process results in the problem solver setting criteria for the solution" (1986:140).

Despite the fact that the expressed 'retrieval' in the verbalisation is of a very low percentage throughout the protocol, these 'recalls' have proven to be the crucial trigger in the process of solution generation. Verbal responses that indicate the retrieval mechanism show the vital role of such activity in the information processing:

97 - 107: So the first thing is some kind of cantilever shaft. You are quite right, when we built Cardross, we cantilevered it 70 feet out over the drop. It was built in concrete and it was a bridge shape. That occurred to me, not (Cardross), but the idea of a building on the, on the section out here, something which was supported or supported...

189 - 191: I once built a long narrow presbytery with a fire place, which would give you in section (...........) You could build the fire place up couldn't you? (.....) and use it to support like this.

The information retrieved is related to constraints in a state of exploring the extent of limitations and potentialities, and consequently, a new information state is generated.

The retrieved information as a mechanism implies the designer's memory. Memory operates on three levels: encoding, storage and retrieval, Figure (6). The stored information, however, is divided as a short and long term memory.
Memory can be thought of as a vast body of knowledge, and short-term memory corresponds to the active part whereas the long-term memory to the passive part. Short-term memory plays an important role in conscious thought. When a designer consciously trying to solve a design problem, it operates as a mental work space, where it is used to store parts of the problem as well as information accessed from long-term memory.

The retrieved information process is a mental operation involving the application of the retrieved information to the expressed constraints. This application is administered through a process of manipulation where a new state of information begins to emerge.

Evidence shows that the more items there are in short-term memory, the slower retrieval becomes. This suggests that retrieval requires a search of short-term memory in which the parameters are examined one at a time.

**Conception:** A Manipulative Aspect of Design: As a category of verbalisation, conception implies all aspects of mental activity involved in the designing activity. Conception takes place through the three stages of the designing process. It is basically guided by the two types of 'thinking': one involved in producing ideas, the other involved in applying them to the problem and evaluating the outcomes. Manipulation in this respect, is illustrated as an aspect of the process.

Thinking through a design proposition implies a sequential organisation of designer's thought. This organisation manifests itself in the flow of information. Eastman indicates (1970), that the source of these information are: memory, the designer's perception of the current design, information from client (experimenter) or deduction from other information.

Psychological studies show that the sequence of thought often takes the form of an argument in which one proposition corresponds to a conclusion that a designer is trying to draw. Such correspondence is developing through a process of manipulation which is defined as a skilful handling or operation; and control activity in the design process. It allows the generation of propositions (solutions) through the artful management of the operational rules that determined by the kind of information employed in the process.

Manipulation is resolved with the verbal response that indicates unsatisfactory mode. Statements of unsatisfactory expression in our case reveal the starting point in each manipulative transit:

122 - 127 *I mean I have to admit I am not sure....*
135 - 136 Can I turn the page and start again.
227 - 228 *It is not my kind of a building*
228 - 229 ....can I look at this
414 - 418 *I am not convinced of that, it doesn't seem to me to be a very good idea....*
422 - 423......I am making it smaller
3.2 Correlating design process with graphic process

a) Frequency distribution: The graph in Figure (7) exhibits the frequency distribution of the two components of the protocol; verbalisation and sketching. The illustrated frequency is constructed by areas, the base of which are given by time intervals expressed in units and the height of which determined by the percentage of the corresponding activity.

![Graph showing frequency distribution]

Figure (7): Sketching frequency distribution

The following table shows the percentage of each activity occurred throughout the classified eight nodes of the protocol, note the verbalisation is categorised to three sub-categories of 'constraints', 'retrieval', and 'conception'. The latter represents both manipulation and reasoning occurred through the process.

<table>
<thead>
<tr>
<th>Node Range</th>
<th>Sketching</th>
<th>Constraints</th>
<th>Retrieval</th>
<th>Conception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node (1): 000 - 139</td>
<td>19%</td>
<td>8%</td>
<td>44%</td>
<td>29%</td>
</tr>
<tr>
<td>Node (2): 140 - 240</td>
<td>35%</td>
<td>13%</td>
<td>1%</td>
<td>51%</td>
</tr>
<tr>
<td>Node (3): 241 - 263</td>
<td>70%</td>
<td>0%</td>
<td>3%</td>
<td>27%</td>
</tr>
<tr>
<td>Node (4): 294 - 370</td>
<td>40%</td>
<td>16%</td>
<td>0%</td>
<td>44%</td>
</tr>
<tr>
<td>Node (5): 371 - 415</td>
<td>44%</td>
<td>3%</td>
<td>0%</td>
<td>53%</td>
</tr>
<tr>
<td>Node (6): 480 - 730</td>
<td>40%</td>
<td>7%</td>
<td>1%</td>
<td>52%</td>
</tr>
<tr>
<td>Node (7): 731 - 822</td>
<td>51%</td>
<td>8%</td>
<td>0%</td>
<td>41%</td>
</tr>
<tr>
<td>Node (8): 823 - 895</td>
<td>32%</td>
<td>3%</td>
<td>0%</td>
<td>65%</td>
</tr>
</tbody>
</table>

A significant property of the sequential order of the verbal / graphical interactions, is they tend to swing between conception and sketching in an almost in regular format, Figure (8) illustrates the total percentage of the activities involved in
the process. It appears to indicate a regularity in its pattern. Close attention should be paid to this pattern, as it provides some insight into the relation between the active tangible and the passive intangible, i.e. sketching and conception.

![Graph of verbalisation and sketching](image)

Figure (8): Graph of verbalisation and sketching

A few qualities have been inferred, particularly the relation between the variables identified in this study as components of designing process:

a) Retrieval, appears to be the 'primary trigger that generates the approach to the problem space. The graph shows the observed 'retrieval' occurs at its maximum within the process of problem representation, and the development of 'problem-space'; 44% of the total activity within the first node was 'retrieval'. Gradually it occupied very low percentages 1% and 3% in second and third nodes respectively, as it may be concluded it becomes relatively small because of its relation to a particular portion of the whole problem.

b) Constraints, tend to mediate other activities throughout the process it exists with relatively regular percentage of an average 7.25%.

It can be concluded generally, that protocol analysis has a useful application in selecting, measuring, and testing the 'isolated' character of sketching, i.e. its integral role in design conceptualisation.

It permits the linking of measurable constructs to the observable phenomenon of sketching, within the framework. Constructs such as 'retrieval', 'constraints', 'conception', and sketching can be measured in terms of time, i.e. percentage of time allocated to each construct.

This study is a pilot and no significant statistical data can be obtained from it. However, it can be concluded that similar analysis of the other case studies of SWEATBOX 1, may provide the opportunity for measurement of the variation, establishing a yardstick for the measuring of variability in the sketching activity.
REFERENCES:


APPENDIX: Protocol Analysis

NODE ONE

1. The trouble I have of course is the kind of buildings I have built all my life of nearly all had very good solid sites.
2. So the idea of building on a site like this is absolutely and totally new to me. And seems to me
(Experimenter) Cardross was built in the middle of a slope.
3. Yes, only a bit of it, only a small very dramatic bit of it. Now it seems to me here the whole site is very very dramatic.
4. I mean the other thing is when they took me around to look to the site and they took me to....
5. As I was saying it is not the kind of site I would normally expect to be confronted with, and when I was shown the site, people took me to this knoll.
6. This is a cross section which I think you have to draw. It is an unbelievable cross section. I have seen it and I still don’t believe it. [33 - 47]

(Experimenter) Even further down than that it is a long long slope.
7. When I was taken to see it, they took me half way to the knoll.
8. Now I imagine my self as visiting lecturer
who has had a pleasant evening in the pub chatting to students. [51 - 52]

the idea of coming along this precarious path and finding my self in a studio to find a bed, seemed a bit odd, but another thing, it struck me any near the knoll is as good as any where along the slope.
9. So it seems to me there is a place there, there is the knoll. There is the edge of the existing building. [64 - 70]

10. Now, what it looks like in relation to this.
11. Just now I can only imagine is like the timber structure which sits here.
12. It seems to me that point there, [75 - 80]

(Experimenter) Yes, it is located by existing trees, a break where they obviously dump leaves down just now, and the edge of the knoll. So your view is framed looking down the river and your approach is predicated here.
13. So the first thought is some kind of cantilever shaft. You are quite right when we built where we built at Cardross with we cantilevered it 70 feet out over the drop. It was built in concrete and it was a bridge shape, that occurred to me at Cardross. But the idea of a building on the section, out here, something which was supported or supported. [101 - 108]

14. We will do it in blue so you can see it here is the existing site.

here the idea of a platform coming out at ground level and supporting it self because of it’s depth, was very straight forward.
15. It is not very wide. It is quite small object, and the other idea is of course to build something here. [108 - 122]

16. I mean I have to admit I am not sure I’m thinking, My thought process is not proceeding from the fingers. 17. These drawings look terrible. It is a hell of slope, and you have to dig very deep founds.
(Experimenter) You can sort of anchor it back?
18. You could. Oh no, it could be done. I am just thinking what I would do. Can I turn the page and start again?

NODE TWO

19. Can I start with the knoll, some where here in the corner and the idea of trees.

[138 - 141]

and, and, personally I would prefer to leave the knoll to be seen, and to may be even

start with the idea of very simple object I which you could enter here. [151 - 159]
I have seen Ted Cullinan doing this on overhead projector. I personally I have never designed with these things markers in my life.

But the idea you could enter here and you would have a work space [I] here and you would have beyond, [I]}

you would have the view cut off by the knoll, and You would have a hall which spoke to the space here which I think in fact [I]

then of course the place where one can sit and _and have a place to sit and talk and be a megalomaniac will be out on the edge.

I once built along narrow presbytery with a fire place, [189 -191]

which would give you. In section [I]

you could build the fire place up couldn't you? [and use it to support this. [198 - 205]

My instinct is to say it is simple it is flat that, it uses structure, it gets glassy towards the end.

(Experimenter) How would you manage the two forms?

I am going to look at that in a minute.

I am just thinking if you wanted water in the studio and water in the kitchen because you need a bog and you need a kitchen, and I don't actually fancy extending it as you need a bog when coming in.

It is not my kind of a building.

You were asking how we would manage these? Well, I would, can I look at this?

 Really what I am saying, is the wall here has to help support this object which, and in there some where [238 -277]

It is a studio, it needs a lot of light and

does further back, and here you enter [279 - 283]

(Experimenter) Where the people sleep?

That is it... here, here some where. What actually I am wondering if you can sleep on the settee I mean it is not good.

Really what I am saying, is the wall here has to help support this object which, and in there some where [238 -277]

It is a studio, it needs a lot of light and

does further back, and here you enter [279 - 283]

(Experimenter) Where the people sleep?

That is it... here, here some where. What actually I am wondering if you can sleep on the settee I mean it is not good.

I think it would be nice if you are going to, do this to sit, looking out, and you could easily have a passage. [294 - 302]

As I said I must come to terms with this, because it is not my kind of a building.

I mean I got a naive idea when I came. If the knoll happened to be big enough,

I would have built a circular platform area to put studio, a bedroom and a sitting room, each one with a different roof shape, [I] entered and hopefully cantilevered it out. [310 - 321]

But such as a steep slope, I don't see how you can build over it and yet to get advantage of the view you need to.

Of course you ought to be able to build that in masonry but I wonder here, which would let you or if you build it in timber.

Is that too big? Soar

(Experimenter) It looks rather big compared
38-You're really looking at to two spaces.
39-Aah... I know where you could sleep up here.

40-If this was two stories you can sleep on that as a balcony, as a platform in the traditional corbusian sense, but instead of having stairs in the studio, you could have a little variation where the stairs come up here.

(experimenter) That looks pretty good. Can you do it in section?

**NODE FIVE**

41-Now if this is one story and this is two stories... before we go any further, it could after all do that and you could sleep up here... and come down here... so that has actually be big enough.

(experimenter) Where is this section taken?
42-It is an imaginary section, it is taken there.
43-Now but in looking to the fact that if you turn that at the right angle, The fact this would have to be in... It is not good.

(experimenter) Which is the sloped roof? Is it the square?
44-This one from this corner up. In other words...
(experimenter) The other building is single story. I thought it is two stories
45-No, this is a single story, this bit comes there up to there and then come down.
46-I am not convinced of that, I am just looking at the idea. It doesn't seem to me to be a very good idea. You've given me half an hour, I am going to flesh the course
47-I mean I like the idea.

I am making it smaller.

in order to build it
48-The next idea, I have is one story studio and this is built above it.
(experimenter) I thought of that might be two stories
49-This. One story, but you have to come out here, that is a lot
(experimenter) If it sloped down towards that point
50-Let us look you mean like this
51-Or even....
52-It is quiet good I like the idea of a dam

[-----------------------------]

53-You need the height, I mean if this thing of one story, here and it fitted in there, then you need a room there to stand up

[450-457]

54-That is studio where you have a lot of people.

one, two, three, four, five. Two, two, two work side by side and master over here in splendour

[461-470]
55-OK. Let's plan all this.
   We'll draw it as a square and see what happens, [] and we are going to have column here and this thing.]
   So we put guys there, here there that determines where are is that bit.
(Experimenter)    You've got a bog to fit in some [here
56-You've also got.....
(Experimenter)    Don't bother about the kitchen too much
57-It could be a bar.  [475-499]

58-In fact I mean putting bog in, the question is whether for to use this wall for the stair
(Experimenter)    I like that stair.

59-I like that too, you get a wash hand basin here, you get a bed over when you get to the top,
   [512-518]
   so you can have a little kitchen cantilevered off the wall here which then you can decide whether the stair case to
   be solid. In this case you can put the WC underneath
(Experimenter)    People don't need to have bath
60-You get a shower in that corner. I am sure we can put.......
61-Like a boat, if you can design a boat we can put on the back we can get a space with a thing on the floor, with
62-WC underneath, and the kitchen, if the doors opened this way, the kitchen, the sink. Oh. I don't know, I don't
   worry about the kitchen sink. This part of fire place that came up

63-We could have the chimney, the fire, a work-top, put a sink in put a cocker
   [549-552]
   top and the fridge underneath and that would then stick up through.

64-     Now we looking at this now as being on the edge. Do I like your Venturi or not
   [556-560]
(Experimenter)    I don't like it
65-I don't like it either
66-We are saying it is back to this being a hall, because if these guys are going to come, they are going to dump
   their stuff.
This is a place where you can sit, chat and have drinks.  [568-570]
(Experimenter)    If people want to do things together where do you eat
67-That is all right

68-     This is. Its a good place to eat.  [583-584]
   Except the food is a way up there Or you could actually do that
(Experimenter)    That table doesn't need to be of regular shape
69-Certainly, So you could put the settee here looking up river, and in a way,

342
begin to think. Now in section, it would be nice, if you could there either slide the door back

70-If the students are building, it is easier. You know this door could slide away and have a rail rather than build a balcony, and...

71-Then you would have a room for setting a round in [ ]

may be you would have a bench.

72-You see the knoll, you want to see that knoll

because its closed in and all these trees
(Experimenter) What about materials. It looks sort of a long distance
73-It looks timber here and masonry there
(Experimenter) What about the studio?
74-And, the studio is the bit we have got come to,

because we’ve got the bank just behind the bank we need two stories.
75-Now let us draw the studio. The two stories because we have, let’s draw it normal to the studio. Now that bit.

That is actually quite big balcony

76-You could raise that bit the balcony could do, you could sleep up there.

that means you could have a bedside too, and this will be the rail of the balcony
77-and, then you are saying we have to
78-Now that is a corner,

that is a post. This is the stair, which looks right, looks about right, WC is underneath here, that bits wall

(Experimenter) Where is
79-Here, I am standing. This bit here is coming out here, and we have to achieve at that point there, we have to achieve the room, bright, to go through the wall.
80-Now this thing could actually fall from that corner. No it couldn’t, it won’t have to fall from there

81-I can imagine a relationship where, the table, so that this thing is two stories and this would fall there I don’t know if you like this do you understand?

(Experimenter) I thought originally it was a Craig Ellwood thing
82-True I thought this is a simple single story thing. Now
83-Let’s just assume that for a minute and look how to deal with a stair as something special.

NODE SEVEN

84-Let’s look at it from the other side. We’ve got this thing here which is two stories box and it can be built in aluminium, it could be framed. It is like this right? This goes through and comes out there goes through
and this stair goes up to here and at that point you are virtually...that is one story height, so that is the roof.

85-But at that point there, through the roof you need to leave some sort of glass box, which the stair comes up in a sort of (789) device. [725 - 774]

86-Well, I will draw a section through this.

87-We have got the balcony with the bed, right? and comes through this wall and then comes down as a stair and at that point we need some kind of glass window which we can either take the wall off and put it against or we can take it up over the wall and make the window up here. The roof can stop there. You are getting some light into a bit of the balcony. So you don’t need any more windows you can even have a vent there.

88-And this is apart from the door is and comes out here

(Experimenter) You have five minutes.

89-And that is the long house these are the benches where the guys are working up here in a free space. It is also part if where you look down. [775 - 810]

Node Eight

90-In that case I think, I will try to summarise it. I think you can build this as a light weight metal and light weight timber, you can build it in timber, you can sheet it in metal or...91-But this will be solid, we will draw solid walls,

because if you look at these potentially solid....This is dotted because it could be window. This is solid to the end of stair, and the stair it self is solid. And the light above there coming down. That is solid but they don’t...but the floor here. [819 - 831]

You can make some...Post-modern changes

92-For the sake of argument

If this floor is a single story flat floor right? [] that bit there [] that is the chimney, and this floor is here. [839 - 862]

93-Right, then You have single flat floor which has bit of two stories space, you can walk into, has a single story space.

It is constrained by this knoll, It picks up the line of this building here to give an approach which perversely, goes off an angle and you enter here. [873 - 876]

94-So there is a place coming down that path against the building...you can extend the pavement.

95-The edge of the bank is here.

These tree which exist and this tree which exist and this tree which exists. This is closed in. This is a view. [882 - 886]

96-My self,
I would tend to finish the sheeted wall there, so the door was virtually hidden in the sheet.

97-The sequence is to go in, and I was saying when you were out the room, that means when you come in here you actually walk past this column, enter single story space with the two stories spaces over it, I think I would put a roof over there and put windows there I might glance the whole thing I like ...You have a roof over there.

98-The kitchen is here, which means you are on your own, you can cook there, you will have a little table there.

99- A bed space is up here, now that implies one tutor. You wouldn't have kids.

100- You then have a private space you have a door out here on a bit of setting out space here which you can then walk up and into the jungle.

101- I mean we are looking to the space, this side is a steep slope down to the river,

<table>
<thead>
<tr>
<th>a marvellous view, it is trees on knoll</th>
<th>[922 - 924]</th>
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<tr>
<th>102-So there is a contained space here.</th>
<th>[925 - 926]</th>
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<th>This looks south,</th>
<th>[925 - 926]</th>
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hides up, this looks to the knoll

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<tr>
<th>103-This grassy knoll with trees coming out off it and the view, here is your dining room table and you are sitting eating here.</th>
<th>[930 - 940]</th>
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<th>104-So you've got one kind of experience, one view. If you are having a discussion here and you know, you are probably build in here cupboard to put coats on. A table or little window seat.</th>
<th>[945 - 954]</th>
</tr>
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So you have place where you can sit closed in by the knoll. There is a place where you can go out into a space and there is a place where you can have a long view out through the trees over space

105-So it seems to me this speaks to that. This takes advantage of that. It is a unique site, I don't have to say it is either there or there. It is the one place where is the knoll meets the lawn on this side, it is a forest on this side.

106-So it seems to me that the building mediates between parts of the site.

(Experimenter) Very difficult.

107-Shall we stop at that point?

(Experimenter) Yes.

108-Now I haven't done the elevation. Every body knows, you can plan any building in this little time and it takes you a year to do elevation. Students love that.