CHAPTER VI

THEORETICAL SUMMARY AND CONCLUSIONS

Two theoretical formulations were employed in structuring this monograph. The "demand-capability" approach introduced in chapter one provided concepts which were incorporated in all subsequent chapters. The temporal distinction between Time One (normal times) and Time Two (the emergency period) as well as distinctions among tasks, authority (decision making and chain of command), and communication derive from this first formulation. Expectations of the nature of the changes in tasks, authority, and communication from Time One and Time Two were also drawn from this first approach.

The second formulation, a typology of emergency organizations, suggested the engineering-maintenance-service classification employed in previous chapters. Certain expectations that this typology generates also contributed to the discussion of these three functional units of the public works. Thus, in addition to presenting a descriptive case study, this monograph has attempted to show the usefulness of these tools of analysis by employing them as ordering devices.

This final chapter is divided into two major sections, each devoted to a summary of the data which fall more logically under one formulation as opposed to the other. However, the goal of this treatment is less to distinguish between the two as to demonstrate how, in the case of the Anchorage Public Works Department, these two analytical devices complement each other. The final section of this chapter presents certain specific characteristics of the public works suggested by that organization's response in the 1964 earthquake.

Demands, Capabilities, and Stress

An organization makes certain demands of its members. It demands that its members adequately perform certain tasks in exchange for which the organization provides certain rewards. In an analogous sense, community demands are made of the organization as a whole, most clearly when the organization is a "public" element of government. Thus, the Anchorage Public Works Department is charged with maintenance of streets, sewers, and the water systems, and with certain planning and engineering tasks, in exchange for which the community has agreed to provide economic support for the organization.

At the level of individual employees and the organization as a whole, these demands (when they are accepted as legitimate) are arranged in a hierarchy, in which they are ranked according to the relative importance attached to each. In this form the demands may be said to have been assigned certain priorities: if task A has a higher priority than B, then in any situation which requires a choice, A is to be satisfied first. Thus, the several tasks of an organization, or of a unit within an organization, or of an individual member of an organization, have certain priorities attached to them at any

given time. Implicit in this arrangement is the idea that, if at any other time capability to perform all of these tasks is limited, those with the highest priority will be attempted even at the expense of the others.[1] These demands constitute the first half of a ratio; the idea of capabilities comprises the second half.

A third element of this scheme, "stress," is defined in terms of emergency demands and capabilities. Stress may be said to characterize a situation when organizational demands rise to such a level that the capabilities of the organization are insufficient to meet them. A stress situation might also occur if capabilities were diminished to such an extent that even normal demands could not be satisfied. Or stress could follow from a combination of rising demands and diminishing capabilities. The archetype of the latter situation would be, of course, a disaster.

Thus, under stress conditions, certain changes are expected in both performance structure (tasks) and normative structure (authority). Generally speaking, these changes are quantitative and qualitative: first quantitative increase in total tasks performed and, second, qualitative change in the kinds of tasks undertaken are anticipated. In addition, as the degree of stress increases, both the total number of decisions made and the number made by unofficial decision makers increases.[2] The data from the Anchorage Public Works Department substantiates these two expectations.

Members of the public works were virtually unanimous in noting the significant increase in tasks during the emergency period. There was more to be done and, excepting street maintenance sections, there was no substantial increase in the number of personnel available to perform them. Maintenance sections -- streets, sewers, and water -- experienced the greatest quantitative change in tasks. Their tasks, however, were essentially those they performed during normal times. This continuity in tasks from Time One to Time Two had important consequences for the Time Two authority structure of maintenance sections.

Because maintenance personnel were familiar with the tasks they were called on to perform during the emergency, no radical change in authority relationships was required. A number of lead men were promoted to foremen and other experienced employees took on the responsibilities of lead men vis-á-vis the emergency personnel added to the crews. But these changes did not constitute departures from normal lines of authority. Crew foremen remained in charge of maintenance activities; crew members continued to take their orders from foremen. Responsibility in decision making was increasingly diffused down through members of the sections, but in every instance of enlarged responsibility, employees indicated they attempted to keep their supervisors informed of any decisions made in the supervisors' absence. Although the chain of command was truncated, it remained the basis of all authority relationships. What might be called "ex post facto authority" was frequently sought, and granted.

Quantitative change in tasks and official changes in authority among maintenance personnel stand in contrast to the qualitative and unofficial changes which occurred in engineering sections of the Anchorage Public Works. Although it is likely that engineering personnel also performed numerically more tasks during the emergency period than they would have in normal times, they were less impressed with this change than with the qualitative changes in tasks which set off the emergency period from Time One. Search and rescue, sewer inspection, and field work were alien to the normal tasks of engineers, yet these were the activities they were involved in during the emergency. Time Two task priorities of maintenance personnel differed very little from the priorities which inform "normal emergencies," but for many engineering personnel the context of their activities changed so radically that no continuity between Time One and Time Two existed at all.

In the absence of any disaster plan or predefined emergency responsibilities for engineers, their activities after the earthquake -- if they did anything as public works employees -- were largely ad-libbed. Maintenance men, as was suggested in chapter four, did what they knew had to be done; engineering personnel, on the other hand, did what they saw had to be done. Indeed, it may legitimately be argued that maintenance personnel possessed an implicit disaster plan insofar as they knew what was expected of them in emergencies. Although few had experience with so widespread an emergency, all "old-timers" among maintenance personnel had been through the spring thaw, Anchorage's "annual emergency," and the demands and priorities of that situation applied with equal relevancy to the earthquake.

Few of the engineers had such firsthand experience. Thus, in the disaster environment, they found a situation for which they had no specific definitions of appropriate tasks or priorities. Their status as public employees, particularly those in supervisory positions, suggested only that they ought to do something. Consequently, they took on new tasks as the situation seemed to demand. But normal lines of authority often bore little relationship to these Time Two activities. Personnel from one section worked under the direction of supervisors of other engineering sections and, at least in one instance, a supervisor lost his position of authority altogether.

Duplication and a certain amount of inefficiency were the necessary consequences of these departures from normal authority. Some time was required before new authority relationships and divisions of labor were clarified. Not until Sunday were these new patterns clear to many of the engineers, and, until that time, coordination of the activities of engineering personnel was problematic -- if not impossible.

Difficulties associated with coordination are illustrated by the emergency relationships of the administration of the public works with various division and section heads normally responsible to the director and his assistant. The Time One autonomy of units of the public works increased during the emergency. This increase, however, especially in the engineering divisions, was not formally determined: it emerged out of the emergency situation. Administrative personnel typically discovered what engineering supervisors were doing after they had begun doing it, and only infrequently as in the

question of the use of explosives did members of the administration exercise their veto power before the fact. The attempt, for example, of the assistant director to structure equipment and supply requisitioning during the emergency was in part unsuccessful because the lines of authority normally linking him with supervisory personnel had already been lost and other, unofficial links had emerged in their place. In addition, the tasks engineers accepted during the emergency demanded immediate attention -- "We saw what had to be done and we did it." By their definition of emergency responsibilities, there was no time to seek out official sources of approval before initiating some activity.

Thus, both the kinds of tasks which engineers performed and their definition of why they performed them contributed to the breakdown of the normal chain of command between administration and section heads. Also associated with these changes in authority was the independence administrative personnel normally granted section heads, independence which section heads could easily increase during the emergency and which the administration found difficult to limit. During the emergency, according to one engineering section head, the organization "broke up into various little zones in the absence of any central command, doing what had to be done. This, I think was pretty general throughout the whole organization."

This atomization of the public works during the emergency had, as described in chapter three, its precedent during Time One. The process of separating divisions and sections in the public works had already begun before the earthquake. The water division, for example, had been created only six months before. Some engineering divisions, notably traffic engineering and building inspection, were engaged in a more or less active campaign for complete autonomy from the public works, autonomy which was, in fact, gained by the end of 1964. This strain toward autonomy may have infected other units in the organization, especially in the engineering division, so that action independent of the public works administration was seen as desirable in itself. The disruption in normal patterns which accompanied the earthquake was, then, an ideal opportunity to demonstrate the "advantages" of this independence.

If, as the demand-capability ratio suggests, the extent of changes in tasks and authority during an emergency is an index of the degree of stress in an organization, then the engineering sections of the Anchorage Public Works Department must be seen as experiencing more stress after the earthquake than the maintenance sections. The capabilities of the maintenance sections -- both in terms of personnel and equipment -- were quickly augmented by local contractors whose men and machinery were employed by the public works in meeting the clearly defined but increased demands of the emergency. Demands made of engineering personnel were not clear enough to determine who or what was required to meet them. Volunteer personnel were assigned to tasks in the same ad hoc manner as public works engineers were. Here, then, is another difference between these two elements: engineering sections, when they increased in size, were augmented by walk-in volunteers; maintenance sections, particularly street maintenance, were enlarged by hired personnel.

The task engineering sections were best prepared to perform during the emergency however, providing technical information concerning the type and location of municipal installations, was frequently limited by the inadequacy of available maps and plans. Because plans of older sewer installations were either missing or incomplete and because some of the newer installations had been made by private developers and purchased from them by the city, locating underground installations was at times very difficult. Here the knowledge of certain individuals, both within and outside the public works, was invaluable. Engineers who had participated in the design of sewage systems or maintenance men who knew from previous experience where these installations were could fill the gaps in official records. This resource was difficult to draw upon, as it depended on public works employees knowing that certain "old-timers" possessed this information and on these "old-timers" being available.

Engineering personnel, then, faced uncertain but increased demands with, in some instances at least, fewer personnel than normal. As was noted in chapter four, the uncertainty of engineers' Time Two responsibilities led to the absence of some of these personnel until relatively late in the emergency period. This reduction in personnel, in addition to normally loose ties with the administration and important gaps in their information resources, all contributed to major changes in tasks and authority during the emergency. During the same time maintenance personnel completed emergency repairs to city streets and made considerable progress in the restoration of water service. This contrast is best explained by the simple distinction between knowing what has to be done in an emergency situation and having to ad lib responses to a disaster.

Disaster, Emergencies, and Organizational Response

In chapter four it was suggested that the terms "disaster" and "emergency" might be useful in distinguishing between two varying perceptions of the same extreme situation. When an altered environment demands qualitative changes in tasks (and, perhaps, quantitative changes as well) organizations experience a "disaster"; when an extreme environment demands only quantitative changes in tasks, organizations experience, it was suggested, an "emergency." In the public works, this distinction may be applied, respectively, to the engineering and to the maintenance sections. Following some brief comments on disasters and emergencies, this distinction will be considered in the context of Quarantelli's typology of organizational response (introduced in chapters one and four). This typology adds significantly to the understanding of the Anchorage Public Works Department during the two days following the 1964 earthquake.

An extreme situation may be viewed from two perspectives. On the one hand, it so disturbs an environment that many normal patterned activities and structured human relationships are interrupted, if not totally suspended for a time. In this sense, an extreme situation constitutes a new environment -- or better, disrupts the normal environment to the extent that it becomes virtually a new one. To this new environment individuals, groups, organizations, and the larger social system of which they are a part must adapt.[3] Thus, the

radically altered (or "new") environment is discontinuous with the normal environment; Time Two is discontinuous with Time One. That an event is defined as disastrous itself carries this connotation. The disaster becomes a wholly separate and distinct event that differs in kind, not simply in degree, from normal events.

On the other hand, the response of those who suddenly find themselves in an extreme situation is not solely determined by these new conditions. For all individuals there are definitions of the relative importance of activities, ideas, and things which carry over into even the most extreme situations. These priorities are implicit in normal patterns of human life, certain of them becoming explicit in extreme situations. Typically issues like individual life and death and the sheer physical survival of social entities receive highest priority. These priorities are not new; insofar as they underlie normal patterns, they may be said to emerge out of Time One. The term "emergency" once possessed exactly this meaning: the act or process of emerging -- a meaning which suggests the necessary continuity between normal experience and extreme situations.

In the broadest sense, disaster priorities and emergency priorities, then, do not require a forced choice between one or the other, but together characterize the response of individuals or social groups to extreme situations. The question is the extent to which one or the other dominates the response.[4] It is possible to ask this question in terms of organizational units. Time One engineering tasks and priorities had little relevance to the disaster environment and major changes were required. For public works engineers, therefore, the earthquake produced a new environment to which they adapted with new tasks and new authority relationships, that is, the situation required disaster priorities. For maintenance personnel the earthquake produced an emergency requiring only quantitative changes in tasks and authority. Normal priorities were carried over, with little or no change, to the emergency situation.

Quarantelli's typology of organizational responses to extreme situations, although it does not deal with this distinction in these terms, adds another dimension to this discussion. According to his formulation, two types of organizations are involved in extreme situations. First, established organizations respond to a crisis, normally with little or no change in personnel or structure. Second, certain other organizations respond to extreme situations, but usually acquire additional personnel and often undergo structural changes as well. Both types Quarantelli, Dynes, and others call emergency organizations, although the second type is more properly designated as having latent emergency functions.[5] Examples of established emergency organizations include police and fire departments and, of latent (emergent) emergency organizations, such volunteer associations as Red Cross and The Salvation Army. In both types, provision for response to extreme situations is, in effect, built into normal operations and structures of the organization. This is the meaning of the term "emergency" in this monograph's distinction between emergency and disaster.

A second dimension in Quarantelli's typology is introduced by the distinction between regular and nonregular tasks. Again, this meaning is included in the distinction between emergency and disaster in this monograph. Quarantelli's idea is that some organizations are prepared to respond to extreme situations by performing essentially the same tasks they would perform in a normal environment, while other organizations, if they respond as organizations at all, must necessarily engage in tasks which are nonregular, i.e., tasks which differ from those they normally perform.

When these two dimensions -- established-emergent and regular-nonregular -- are combined, the result is the fourfold classification of the types of organizational response to extreme situations presented in chapter four. Type I designates established organizations which respond to extreme situations by performing regular tasks, that is, organizations which are prepared to operate in extreme situations without undergoing radical change in personnel, authority relationships, or tasks. Type II refers to organizations which emerge in an extreme situation, organizations which usually take on additional personnel and often alter their normal authority relationships, but perform traditional, although not everyday tasks in a crisis. As was suggested, the clearest examples of these two types are emergency organizations such as the police force on the one hand, and, on the other, voluntary associations like the Red Cross.

Types III and IV refer to organizations which engage in new tasks as they respond to extreme situations. Type III organizations are those which exist in Time One, but which are not emergency organizations as that term can be applied to Types I and II. Rather, they are organizations which normally perform tasks having little or no direct relevance to extreme situations. To the extent that members of such an organization respond to a crisis, they necessarily take on new tasks, often supervised by personnel of Type I or Type II organizations. In Anchorage the numerous private contractors who offered their personnel and equipment to the public works after the earthquake illustrate the pattern associated with Type III organizations. One essential characteristic of this pattern, according to Quarantelli, is that "the participants are primarily acting on the basis of their pre-disaster group affiliations."[6] Accordingly, individuals who volunteer their services as individuals -- apart from any organizational ties they may possess -- do not belong in this category.

Type IV organizations are created by the extreme situation: they do not exist, as distinct organizations or groups, prior to the crisis. Even more emergent than Type II organizations, Type IV organizations form to satisfy specific demands of the situation and, almost as quickly, dissolve when the crisis has passed. The demands which give rise to Type IV organizations are frequently associated with crises involving a number of separate organizations, that is, crises which are community-wide and require the mobilization of police and fire departments, volunteer organizations, and, perhaps, Type III groups which are normally not expected to engage in emergency activities. In these circumstances a need for coordination among the various organizations often exists and some kind of Type IV group may emerge in response to this need. Demands for interorganizational control and/or a central source of information may also contribute to the formation of Type IV organizations.

In its initial formulation, this typology applies to the several organizations which may respond to an extreme situation. Indeed, one of the expectations which derives from this typology is that the extremity of a crisis may be indexed by the type of organizations which respond: when Type I organizations are sufficient, the situation is likely to be less extreme than those to which Type II, or Type II and Type III organizations also respond. This same typology may also be useful in the analysis of a single complex organization like the Anchorage Public Works Department, an organization which includes within its divisions and sections several distinct groups, i.e., engineering, maintenance, and service units.

The differences between an emergency and disaster suggested above are derived, in part, from comments made by respondents in the Anchorage Public Works Department. This distinction also parallels Quarantelli's formulation: Type I groups responding to an emergency and, at the opposite end of the scheme, the emergence of Type IV groups being a clear index of disaster. This suggests that it may be useful to consider the response of the maintenance sections of the public works as an example of Type I or emergency response and those of the engineering personnel as Type III or disaster response. Certainly Quarantelli's typology would add to the understanding of the emergence and operations of the disaster control office since that group may now be seen as an example of Type IV organization. Neither the emergency-disaster distinction nor the typology of organizational response applies as readily to the service and administrative sections of the public works. However, with some reservations, these analytical devices may be applied to them as well. The remainder of this section has been devoted to these analyses.

Of all public works personnel, those who were members of maintenance sections were best prepared to respond to the effects of the earthquake. As emergency units within the organization, they possessed the necessary experience to begin the massive tasks of restoration of the city's street, sewer, and water systems without extensive reorganization or emergency instruction. The addition of personnel and equipment to the street crews generally increased their efficiency since the new men were given tasks for which their normal employment had prepared them, despite the fact that during Time Two they worked for the city.

The limited number of personnel in the sewer crew -- and the frequent lack of necessary maps and other information -- restricted to a certain extent the efficiency of that group. In any case, highest priority was given to emergency street repairs since without access through the damaged areas of the city, repairs to sewer and water systems could not begin. New personnel on the sewer crews required several days' active experience before they could function independently. Similarly, the water maintenance crews, when they were expanded, added experienced personnel loaned by the Fairbanks water department.

With the exception of the street crews, for which experienced personnel were locally available, few maintenance crews added significantly to their numbers during Time Two. Again, it is illuminating that those personnel who did join the maintenance crews of the public works were taken on, not as

volunteers, but as paid employees, with the understanding that most of them would work for the city only during the emergency. Emergency groups, according to Quarantelli's generalizations on Type I organizations, "tend to use only their own personnel or almost identical personnel from similar groups elsewhere."[7]

If the characteristics of Type I organizations suggest that maintenance sections of the public works belong most logically in that category, Type III recalls the activities of the engineering personnel. Engineers took on a variety of new tasks during Time Two, tasks which bore at best only a minimal relationship to their Time One responsibilities. Some confusion and duplication was the result, particularly as their new tasks tended to overlap with the normal responsibilities of maintenance personnel. Probably the single most important factor which accounts for the response of the engineers to the crisis at all was their definition of themselves as public employees and, among many of those engineers interviewed, as supervisors within the public works. Taken together, these two elements of their organizational affiliation demanded action of them in a public crisis, not as individuals, but as members of the city's public works department. That the supervisors were also mutual friends and normally worked in collaboration with one another very likely added to the imperative to act as a group.

Despite the strength of organizational and personal ties, the engineers suffered rather clearly from lack of coordination, not as much among themselves -- although even here there was duplication -- as with other divisions of the public works. Not until Sunday were activities of engineering inspection teams coordinated with activities of maintenance crews, and only then was the extent of duplication among engineering personnel clearly demonstrated. Confusion of this sort among organizations, according to Quarantelli, is one of the factors which produce Type IV groups. Confusion of this sort within a single organization may also contribute to the emergence of Type IV groups.

The Disaster Control Office may, in fact, be seen as a unit which mediated between the engineering and the maintenance sections of public works, although its formation was initially a partial consequence of the absence of a functional civil defense unit in Anchorage. As was suggested in chapter three and chapter four, the building construction and maintenance section (whose members formed the core of the Disaster Control Office) was largely maintenance-oriented, although structurally included in the engineering division. To that extent the section was ideally placed to emerge as a coordinating link between these two functional divisions. Headed by an engineer, its personnel were maintenance men whose normal responsibilities included the maintenance and repair of publicly owned buildings. As it first emerged, the Disaster Control Office was a search-and-rescue operation; but it soon took on other functions as well, one of which may be seen as an attempt to coordinate engineering and maintenance activities. Thus, in addition to its activities in securing damaged buildings, it also became something of an information center, bringing together data on the extent of the earthquake damage and areas of the city which had been inspected. Members of the Disaster Control Office emphasized that this function, like the others which they accepted, was attempted largely because of the absence of any other source of information.

The Time Two activities of the service and administrative section of the public works are less amenable to analysis in these terms. On the one hand, service personnel, like the water division's customer service section, took on new nonregular tasks which would suggest that they exemplify the characteristics ascribed to Type III groups. Interview data, however, indicate that they were absorbed by other divisions and sections of the public works and did not maintain their identity as a distinct group within the department. They did not, apparently, resume their normal tasks until sometime after the disaster. No major changes in authority took place.

The customer service section, therefore, appears as a Type III group which virtually ceased to be a distinct group for some time after the earthquake. That its normal activities -- meter reading and the like -- were not only irrelevant but also impossible until the restoration process was complete probably accounts for its temporary extinction. However, this observation also suggests that perhaps the section members should not be visualized as a group at all, but simply as persons who participated in disaster activities as discrete individuals. That is, they could be viewed as volunteers who worked with public works only because of their greater familiarity with that organization. This happens to members of many complex organizations during large-scale emergencies. Their organization ceases to function as a unit; the members are thus freed to offer their services as volunteers for other groups.[8] In the Anchorage Public Works Department, consequently, the members of the nonfunctioning customer service section might be seen as individual volunteers in functioning parts of the organization, rather than as persons shifting their organizational role. As was indicated earlier, they often worked apart from their usual co-workers and at tasks quite foreign to their normal routine.

This kind of explanation also seems applicable to the activities of members of the sanitation section. They likewise became attached to other groups but were engaged in tasks related to their Time One responsibilities. Normally, however, these tasks were not performed by sanitation personnel. Furthermore, by the end of the emergency period on Monday, members of this group had returned to their own section and to regular, although expanded, tasks. They were able to resume their routine schedules far earlier than could members of the customer service section.

Administrative personnel discussed in this monograph include both office employees, like the administrative assistant, clerks, and secretaries, and those who may be called "decision makers," like the director, his assistant, the public works superintendent, and his assistant. Office employees generally filled in wherever they were needed, returning to their normal tasks by the Monday following the earthquake. They did not constitute a separate unit within the public works and apparently acted as individual members of the organization whose new tasks were defined by the requirements of the situation and the instructions of those under whom they normally worked.

Similarly, it is probably unnatural to consider the decision makers in the public works as a distinct section. With the exception of the director,

whose responsibility was the entire organization, every member of the administration had charge of specific sections of the organization. Thus, the assistant director was less an administrator -- in the classic sense of that term -- than an engineer; the public works superintendent and his assistant were not really what their titles implied -- rather they were the superintendents of the maintenance division. Even the director of public works himself, as noted in chapter three, considered himself an engineer who was also an administrator, rather than the reverse.

If, as has been suggested in this report, the continuity or discontinuity of task priorities is reflected in the changes in organizational activities and authority relationships during an extreme situation, office personnel of the public works experienced a disaster -- a set of conditions which required that normal priorities and tasks be exchanged for new ones. Administrative personnel, on the other hand, as decision makers, did not engage in totally new tasks nor were their task priorities drastically revised. What did occur was a downward diffusion of authority to make decisions so that they shared their authority with members at lower levels of the organization.

Every analytical system used in the study of complex organizations must be flexible enough to take into account the peculiarities of a given organization. The principal purpose of this monograph has not been to test the validity of any particular scheme but to describe the response of one organization to one extreme situation. In the process of this description, two formulations were introduced. In this last chapter they have been defined and the extent to which they help understand the Anchorage Public Works Department data has been discussed. Specifically, this chapter has demonstrated how the typology of organizational response adds another dimension to the analysis of demands and capabilities. This dimension suggests where extreme situations may be expected to produce quantitative and qualitative changes in organizational tasks and authority.

The final words of this monograph -- in keeping with its primary purpose -- concern certain characteristics of the Anchorage Public Works Department as a unique organization. The following section is devoted to a discussion of its overall Time Two structure, the effect on its Time Two operations, its lack of a disaster plan, and certain qualities of its personnel in general.

The Anchorage Public Works Department: Conclusions

At several points in this monograph, it has been noted that the Anchorage Public Works Department impresses both observers and members of the organization as less a single, identifiable unit than a collection of loosely affiliated divisions and sections, each one of which operates more or less independently of the others and of the administration. The public works is, in fact, plural; it is a decentralized federation of parts rather than a centralized organization, even one with a relatively complex division of labor.

Administrative laissez-faire -- "I let my division heads operate as independently as possible" -- is the implicit policy of the organization. Division heads, as well as administrators, generally act on this basis. Separation of operational units in the public works began in Time One and in certain instances was accelerated by the organization's experience after the earthquake; this, too, constitutes evidence for the plurality of the organization. Thus, the water division and the building construction and maintenance section were created shortly before the earthquake; by the end of 1964, the divisions of traffic engineering and building inspection were completely autonomous, and the building construction and maintenance section was a separate division within the department.

During Time Two four operational units emerged which overlapped and consolidated certain elements of organizational structure which were officially discrete. These new units demonstrated the artificialities of some official distinctions.[9] They also reflected the independence of many divisions and sections both from each other and from the administration. Most coherent of these Time Two units were two maintenance groups: streets and sewers on the one hand, and water (treatment plant and maintenance) on the other. Linked to the general maintenance section by the head of the construction section was a third unit of engineers, including the survey and design heads, some members of their sections, and a number of local architects and engineers from private firms. The fourth unit was the Disaster Control Office, directed by the head of the building construction and maintenance section and, in addition to extraorganizational personnel, including members of the building inspection division.

During the emergency period, members of other divisions and sections of the public works were either absorbed by these four units or were essentially inactive in departmental activities. Individual members of the water division's customer service section and the sanitation section took on new tasks with other groups. The division of traffic engineering was inoperative.

During Time Two, restoration and maintenance of essential services were the foci of public works operations; personnel, sections, or divisions which could not contribute to achieving these goals were outside the reorganized public works. It is an overstatement to say, as one public works employee put it, that

> what really happened /to the public works/ was what happened to my . . . regiment /in the war/. First thing we did was lose all communication with our higher command. So we had ten or fifteen companies of infantry all operating as guerrilla companies.

However, this evaluation correctly suggests that plurality was a peculiar characteristic of the Anchorage Public Works Department and that this decentralization was revealed during Time Two in the number, composition, and activities of the units which emerged in the organization.

Disaster plans are one of the more important devices employed by organizations to promote efficiency and coordination in the event of extreme situations. Developed plans which have more than an existence on paper -- that is, plans which are used or, at least, rehearsed -- are likely to have a salutary effect on organizations under stress. The Anchorage Public Works Department, however, had no disaster plan. Among nonmaintenance personnel, if any one lesson was learned during the earthquake, it was that such a plan would have been useful: public works personnel were more likely to suggest the adoption of a disaster plan than any other change in the organization as a result of their earthquake experience.

Such a plan would have been most useful for engineering and office personnel. These members of the public works were least certain of their responsibilities during the crisis; definitions of tasks and authority appropriate to the disaster environment would have considerably improved the efficiency of these personnel. Certainly a viable plan would have reduced much of the duplication and confusion accompanying the early disaster activities of these personnel.

Maintenance divisions and sections of the public works, however, may be said to have a built-in plan for emergency operations.[10] Insofar as meeting normal emergencies is a part of the Time One responsibilities of water, street, and sewer crews, these personnel possessed a well-rehearsed plan which was employed in coping with the more diffuse and damaging emergency. Task priorities and authority relationships had been previously established; most changes demanded by the earthquake were made within the context of these existing relationships. A more explicit emergency plan, however, might have increased the effectiveness of these crews' response to the earthquake, particularly as such a plan would have clarified the relationships and division of labor between maintenance and nonmaintenance personnel. As the plan existed, it tended to define emergency tasks and authority appropriate only for maintenance section personnel.

In addition to decentralization of public works administration and differences in disaster response of maintenance and engineering units, characteristics of certain individual members of the public works have been pointed out in the course of this monograph. Of these characteristics, the most important is length of employment, either in the public works or in other municipal agencies or local enterprises engaged in comparable or related activities. Such "old-timers" possessed information and skills particularly useful to the public works during Time Two. Their information and skills were especially important because employment turnover in Anchorage is generally high enough to preclude a large permanent base of experienced personnel, either in decision-making positions or on the line. Frequently, the first-hand knowledge of these "old-timers" compensated for the incomplete records of utility installations and the like. Restoration of service to public utilities, especially underground systems like sewers and water, would have been significantly delayed had the experience and knowledge of these "old-timers" been unavailable.

This monograph not only sought to add another case to the study of complex organizations -- although that was its principal purpose -- but also to demonstrate the usefulness of certain theoretical devices in the study of such organizations. To the extent that these devices help to predict from normal operations the activities of complex organizations in extreme situations, they have been useful implications for the total field of organizational research. It is hoped, too, that this analysis of the Anchorage Public Works Department adds to the knowledge of the field.

FOOTNOTES: Chapter VI

1. For a broader discussion of community priorities, see Daniel Yutzy with William A. Anderson and Russell R. Dynes, A Bad Good Friday: Community Priorities in the Anchorage, Alaska Earthquake, 1964, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).

2. These expectations should not be taken as rigid formulations to be tested. Indeed, they are stated in a much more general form here than in the original papers. Their purpose in this context is simply to suggest the nature of the scheme and its relevance to the public works.

3. What results from this adaptation is, in Barton's words, the "emergency social system." See Allen H. Barton, Social Organization Under Stress: A Sociological Review of Disaster Studies (Washington: National Academy of Sciences-National Research Council, 1963).

4. Williams' distinction between "cultural structure" and "social organization" gives these emergency and disaster priorities a larger framework. Thus, emergency priorities reflect cultural definitions; disaster priorities reflect those rather more variable patterns of social organization. See Robin M. Williams, Jr., American Society: A Sociological Interpretation (2nd ed. rev.; New York: Alfred A. Knopf, 1963), pp. 193-194.

5. E. L. Quarantelli, "Organization Under Stress," Symposium on Emergency Operations, ed. by Robert C. Brictson (Santa Monica: System Development Corporation, 1966), pp. 3-19; and Russell R. Dynes, Organized Behavior in Disaster: Analysis and Conceptualization, Disaster Research Center Monograph Series (Columbus: Disaster Research Center, The Ohio State University, 1969).

6. Quarantelli, "Organization Under Stress," p. 18.

7. Quarantelli, "Organization Under Stress," p. 10.

8. For a discussion of how the cessation of functioning of organizations during disasters frees their members for individual volunteer work in other groups, see Dynes, Organized Behavior, chap. vii.

9. Because these operational units emerged out of a somewhat atypical environment, the boundaries among them should not be taken as evidence of "national" cleavages. Although certain of the relationships which developed during Time Two were apparently based on functional ties which characterized normal environments as well, others of them appear to be products of the extremity of the situation. The distinction between emergency and disaster may be useful in separating one type from the other.

10. The impression of some DRC field staff has been that some Type I emergency organizations would be reluctant to call such a schedule a disaster plan. For police and fire departments, only emergencies exist, not disasters. The latter term, apparently, is taken as an indication that substantial doubts of the organization's capabilities exist.

APPENDIX

DESCRIPTION AND DIAGRAMS OF THE ANCHORAGE PUBLIC SAFETY BUILDING

The corridor of the Public Safety Building was inordinately crowded throughout most of the emergency period. Much work was done right at the police counter or in the corridor itself. Public officials mingled with the crowd and were hailed by runners. Diagram 1 shows the area as normally used; the utilization shown in Diagram 2 developed Saturday morning. City civil defense and search-and-rescue personnel were allocated office space then. The mayor and the manager were using the fire chief's office. The special missing persons group was established there on Sunday afternoon.

The desk in the corridor outside the Civil Defense office was placed there on Saturday. An MP was posted to keep the crowd from wandering into the offices. A girl at the desk was to provide information and screen those asking to see city officials. This block, while not very effective, did keep some of the crowd away. However, many persons came in through the side door at the entrance to the fire station.

On Saturday evening, The Salvation Army posted an officer at the desk shown in Diagram 2. They kept a representative there during the entire weekend.

The information desk was not placed in the main corridor (see Diagram 3) until Monday when two men were assigned to devise some way to post information about the activities in progress, the persons responsible, and how they could be contacted. These two eventually produced a number of large charts listing this information. The charts were posted in the main corridor behind the two desks there.

The volunteer desk was placed in the corridor on Saturday to register volunteer's skills, names, and addresses -- and to keep them away from the overcrowded corridor in the center section of the building. The food desk was provided by The Salvation Army and stocked with coffee, sandwiches, pastries, and milk. Early press conferences were held in the courtroom.

A mobile broadcasting studio was placed in position by 8:30 p.m. on Friday, and the Army field kitchen was set up on Saturday about 9:00 a.m. Both remained in position throughout the emergency.

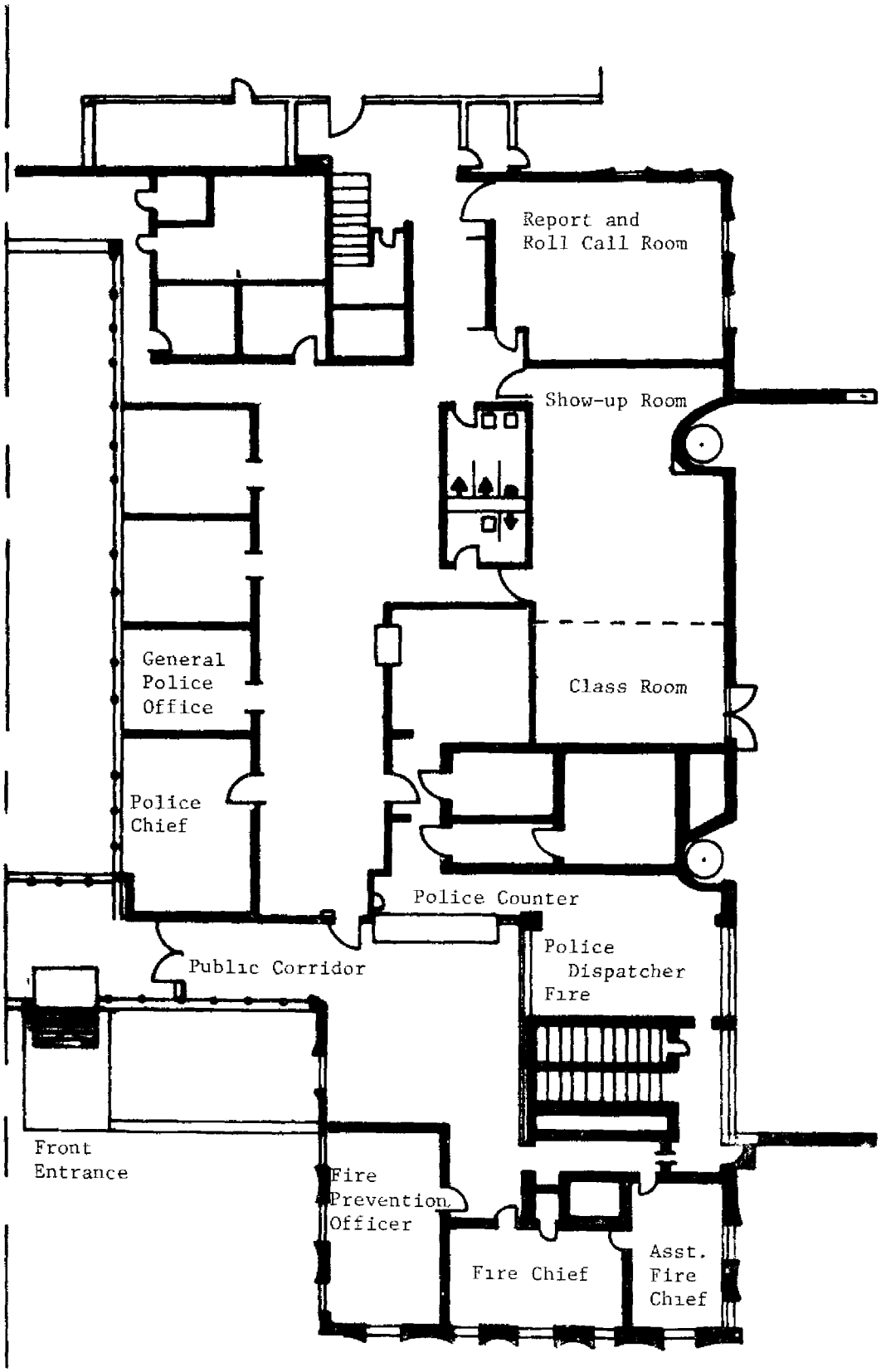

Diagram 1 - Anchorage Public Safety Building, Center Section: Normal Distribution and Utilization

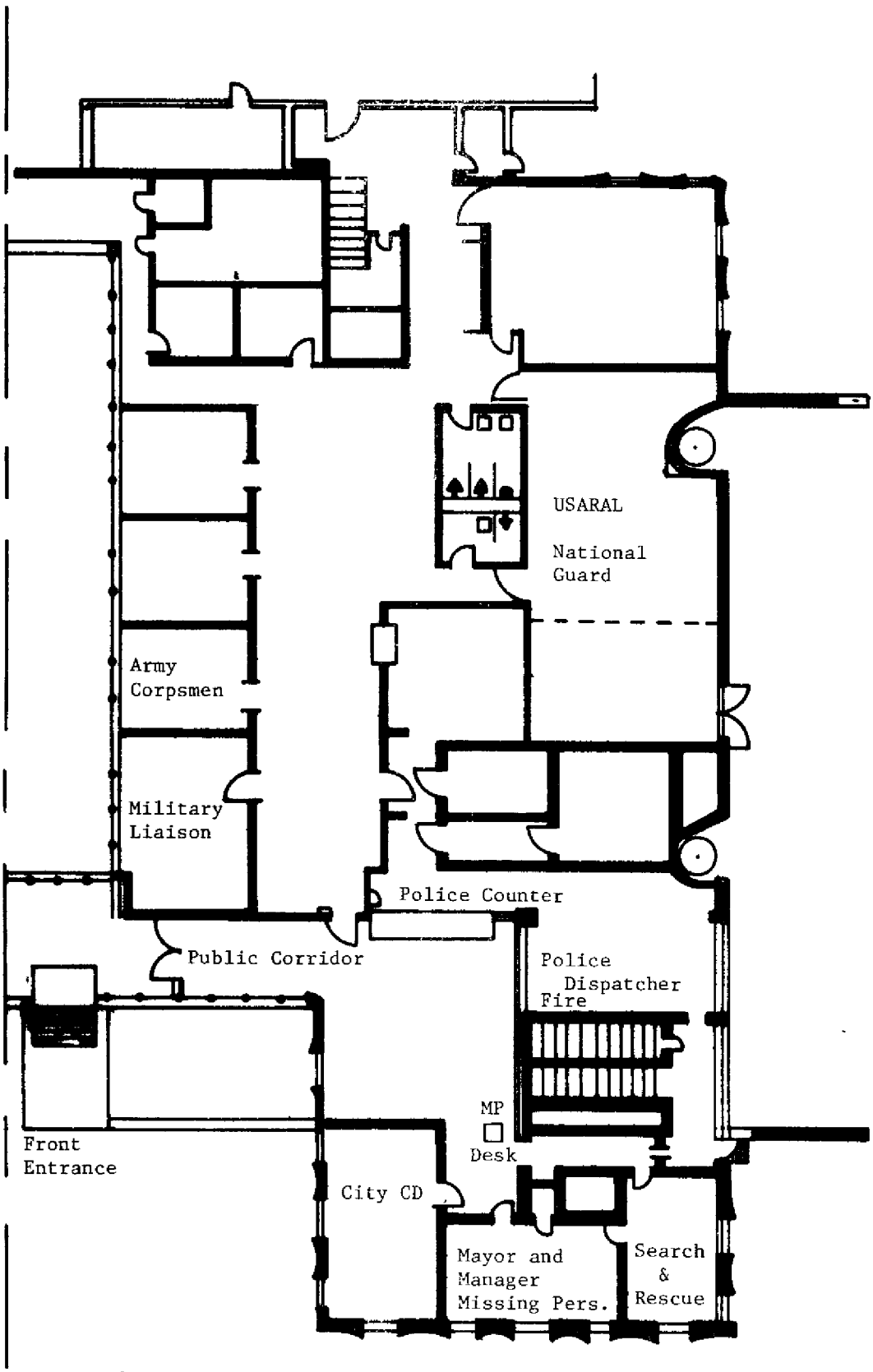

Diagram 2 - Anchorage Public Safety Building, Center Section: Emergency Utilization

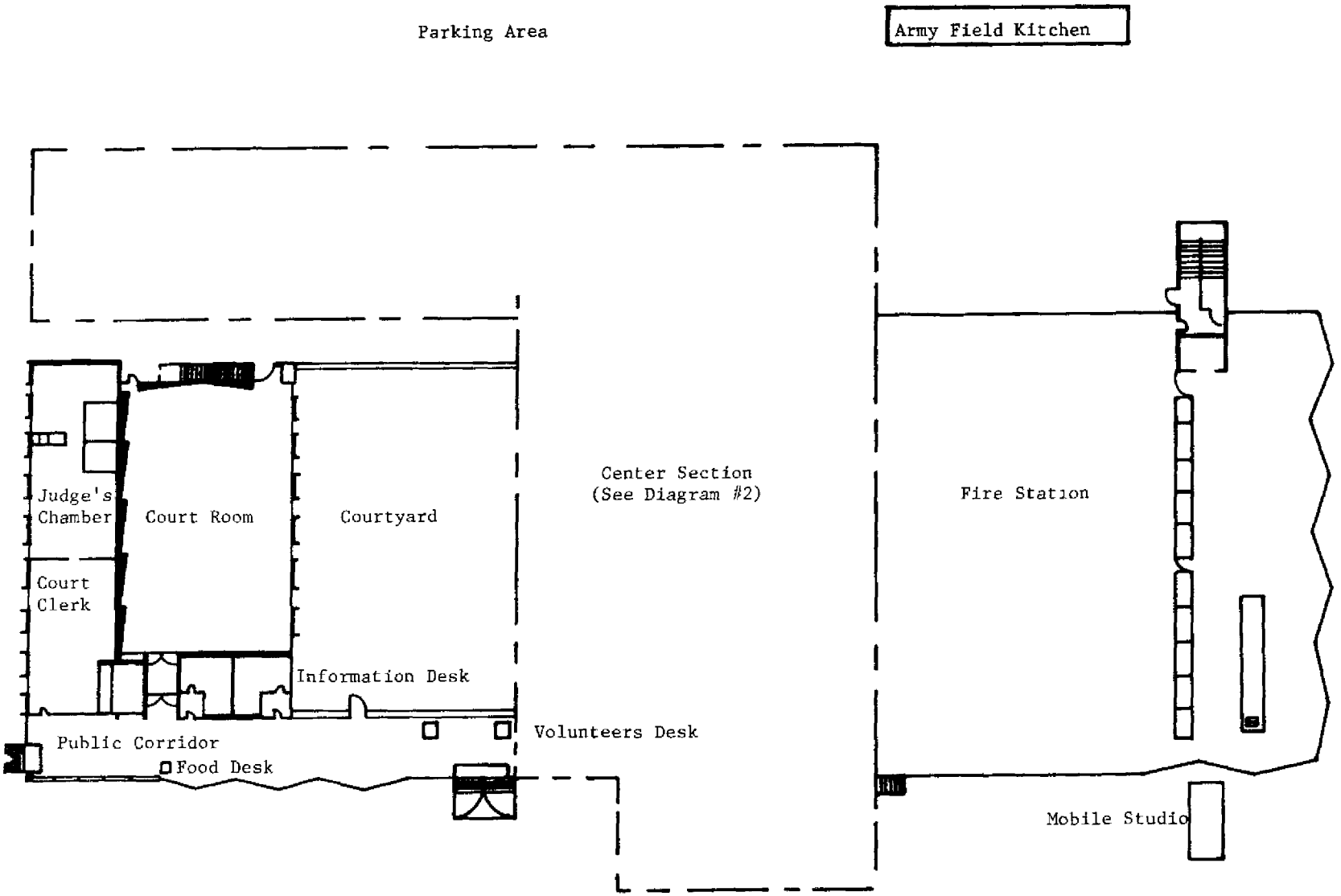

Diagram 3 - Anchorage Public Safety Building: Emergency Utilization

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13. ABSTRACT
On March 27, 1964 Anchorage, Alaska was struck by an earthquake. Buildings and streets were damaged and essential water and sewer services disrupted. Within 27 hours of the impact a Disaster Research Center field team was dispatched to Anchorage to begin a study of the response of various community organizations to the disaster, a study which required 6 separate field trips and was concluded in the fall of 1965. A major part of this longitudinal study concerned the disaster responses of the Anchorage Public Works Department, the municipal agency most involved in meeting the emergency demands. Sixty in-depth interviews were conducted with members of this department. This monograph summarizes and analyzes this interview data. Additional written material supplements this data. The analysis employs two analytical schemes developed at DRC. One provides a framework for comparing organizational behavior during "normal" time (Time One) and emergency (Time Two) operations. The other scheme distinguishes among four types of organizations comparing them by their structure and tasks. The analysis suggests that the behavior of members of the Anchorage Public Works Department during the emergency may usefully by characterized as emergency actions and disaster reactions. Members of maintenance divisions acted in terms of their standard emergency procedures; members of engineering divisions on the other hand, reacted to a unique and discontinuous event. They were required to improvise much of their response to the disaster, this improvisation being most clearly demonstrated in the Time Two emergence of a new engineering group within the public works department. The distribution of Time Two operational problems in tasks, authority, decision making, and communications are related to this distinction between emergency actions and disaster reactions.

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THE DISASTER RESEARCH CENTER

The Disaster Research Center (DRC), a part of the Department of Sociology at The Ohio State University, was organized in 1963. The Center is engaged in the scientific study of individual, group, organizational, and societal responses to community-wide disasters and other extreme stress situations. Major focus of the research is placed on obtaining an extensive and detailed picture of the human and social problems generated by these events, and how they are solved by affected persons, communities, and societies. The Center conducts field studies both in this country and overseas. Part of the research of the Center also involves the laboratory study of groups under stress.

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