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FINAL REPORT

ENGINEERING SECTION - *C. W. Parnes*

OPERATIONS DIVISION

Washington, D. C.

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This report will start out with the status of the Engineering Section in the San Francisco office in 1942, referred to in the early stages of the WRA formation as the Public Works Section. I was transferred from the Indian Service to the War Relocation Authority on May 29, 1942 to the San Francisco office to the position of Head of the construction organization in the Engineering Section with the responsibility for organizing a construction staff on each of the six western centers, for assisting center staffs in determining building requirements, in working with educational, health and agricultural sections in the Regional office to determine the kind of program they were planning for the several centers and the extent of building that would be required for each activity.

Arrangements were made with the Farm Security Administration in San Francisco Regional office by the engineer in charge of the Public Works Section at that time to prepare plans, specifications and material estimates for the large school building program that was deemed necessary for each of the centers and to prepare plans, specifications and estimates for housing requirements. A standard procedure in planning was developed that could be applied at each

center taking into consideration the differences in climatic conditions. All of the buildings for which plans and estimates were made by the Farm Security Administration were based on minimum space requirements and a minimum standard of construction that embodied standard procedures in safety requirements and fire protection. It was also necessary to take into consideration the difference in climatic conditions anticipated at the various relocation centers and prepare plans accordingly. The Farm Security Administration regional staff in San Francisco used practically their entire organization for the preparation of plans and specifications, field trips were made to all centers to work up site improvements plans and in order that all requirements such as water, sewage and farm land could be considered, also to prepare landscaping plans to conform with local conditions. They were at that time admirably equipped to handle this kind of job because they had just finished an extensive building program of their own that was at least in part discontinued after war was declared.

The first 60 days in the San Francisco office proved to be very hectic, everyone was new at a new job. There was a rush to build up organizations, recruiting of staff members was a constant problem and we were confronted by a continuous stream of plan changes that were deemed necessary by new staff members or because of conditions developing in a new organization that had not been anticipated before hand. During this period of time several organizational

changes were made as a result of a new survey of anticipated work load for the Public Works Section.

The Chief Engineer position in the San Francisco office was abolished, thus the several unit heads in the Engineering Section were answerable directly to the Chief of the Operations Division, R. B. Cozzens. This included the public works activity which was comprised of construction, maintenance and operation, the fire protection unit and motor repair unit. At this time it developed there was a duplication in that a motor operation unit had been set up in the Supply Division, thus the repair facilities were under one division head and the administration of motorized equipment was in the Supply Division. It appeared advisable to consolidate motor operation and maintenance and the Regional Director decided that they should be in the Supply Division rather than in the Operations Division.

The public works organization of the San Francisco office included an office engineer, a statistician and an architectural engineering position that was filled by transfer from the Farm Security Administration, and several draftsmen. Other positions were added as needed. A good deal of the time of the unit heads for the several activities was from necessity consumed on field trips working in cooperation with Project Directors and the field staff in determining the building requirements, setting up organizations and recruiting staff. It was necessary to require the several relocation centers to complete plans and estimates for all projects anticipated other

than school and housing requirements because of the limited number of architects and engineers in the San Francisco area. The Farm Security Administration Regional office had indicated that the schools and housing jobs were the only ones they could handle, since many of their people were being transferred to other activities and with an increased demand in their own field.

During the period of time from the inception of the WRA program until late September, it was anticipated by the WRA administration that the Army and Quartermaster would purchase the materials required by WRA to carry on the programs planned for the several relocation centers as a part of their obligation for the total program. During the summer all requisitions for building material and all equipment were returned by the Quartermasters with the advice that the U. S. Engineers would have to purchase these items. It was found, however, late in September that the Engineers had no intention of purchasing materials required without priority ratings to be obtained from the War Production Board by the War Relocation Authority. At that time all of the requisitions that had been sent to them from the inception of WRA, with a few exceptions, were returned. Thus, nothing had been accomplished in the way of purchasing and obtaining delivery of scarce materials in order that housing could be provided for staff members at the several centers and to provide schools and other buildings necessary to the continued operation program.

It became necessary on very short notice for the WRA in the Regional office to prepare a duplicate set of plans for all the buildings contemplated for the several centers that required the use

of critical materials not already on hand along with specifications, estimated prices of materials, equipment etc., and a unit cost estimate for submission to the War Production Board in Washington for their consideration. It developed that the Supply Section had in their employ a priority specialist whose services were made available to the Operations Division. Immediate steps were taken to recruit draftsmen, estimators, and to provide working space and to start assembling applications. This proved to be a tremendous job and it was not possible to complete the applications for those construction jobs considered essential before winter set in or until the latter part of December. More will be said further on in this report regarding the preparation and submission of applications for priority rating to the War Production Board in Washington.

The same problem applied to the irrigation and roads organization in the Regional office and at the centers. In every case extensive maintenance or new construction was required to develop land for the large agricultural programs planned for the centers and to provide water for irrigating such lands. At several of the centers all of the land planned for use required complete development and the complete development or extension of irrigation facilities and roads. It was the plan at this time to produce as much as possible of the food stuffs required to feed the evacuees at the centers and to make the largest possible contribution of foods required by the armed forces. Thus, a very important part of the total program was unnecessarily delayed because of a misunderstanding between WRA and the military regarding the purchase of scarce materials.

I will not attempt to cover in detail the magnitude of irrigation and land development at the several centers, since this phase of the program is covered in detail in the reports prepared by each center. We were faced with the immediate problem of employed personnel to make plans for such development, to supervise construction work and in locating, purchasing and obtaining delivery of heavy construction equipment, hand tools, and other miscellaneous supplies required for carrying on this extensive and important work. It is next to impossible to portray the tremendous work load that was thrown on the small staff in the San Francisco office and on the project administrative staff at the several centers. In most cases evacuees were being received at the centers while the contractors were still at work completing buildings and installing utilities. In some cases subsistence supplies had not yet been delivered, cooking equipment had not been installed at other centers when evacuees were received. At the same time the Operations Division was recruiting evacuee labor and proceeding with plans for the development program in so far as this was possible under the circumstances.

In most cases the location selected for constructing the centers was on desert or waste land that had not previously been developed. There were no roads leading to these sites, no water available for stabilizing the soil, as a result they proved to be miniature dust bowls. Every street in the centers and the roads leading to and from them were broken up and in many cases became impassable without some kind of stabilization. This dust condition continued through the summer of 1942 and in some cases on into the spring of 1943 before weather conditions stabilized the dust condition or before water was available for irrigation or sprinkling. It is

surprising indeed that the degree of progress made was possible under the adverse conditions that existed at all centers. It must be remembered that when the sites were selected there was no water developed for domestic or other purposes, in most cases wells had to be drilled, storage tanks erected, before water could even be available for construction purposes.

The construction of the centers was conducted by the Army Engineers by contract. Because of the haste necessary in moving the evacuees from the Pacific Coast, the Army Engineers insisted that everything possible be done to expedite preparation of the centers. Thus, contractors were in many cases required to work the construction crews a great deal of overtime. Contractors were also having difficulty in employing enough of the skilled labor necessary to complete the installations. The adverse physical conditions under which the contractors had to work increased the cost of the installations tremendously. At the same time the contractors were recruiting workmen to complete the centers, WRA was in competition with them in an attempt to meet staff requirements at the centers.

When the contractors finally finished the centers much of the surplus building material on hand was purchased by WRA. Thus, some of the materials so urgently needed to carry on the extensive program was made available, but in no case were the materials available to complete units of buildings so critically needed to house staff and in general to get the program underway. A limited amount of equipment,

passenger carrying vehicles and trucks were supplied by the army. Very little heavy equipment, however, was available from that source.

Included in the basic construction of the centers was housing, barrack type, for approximately 40 employees. The urgent need for expediting the WRA construction program will be evident when it is realized that approximately 200 employees were required at each of the centers. These employees in some cases drove many miles to and from the centers daily, others were forced from necessity to reside in buildings constructed for use as warehouses, recreation buildings, and in some cases employees occupied the barrack buildings constructed to house the evacuees. Because of the delay in obtaining construction material and getting the housing program under way, this kind of housing continued through 1943 at most of the centers. Not until the latter part of 1944 was it possible to purchase enough material to provide personnel quarters at all of the centers. This kind of living conditions discouraged employment of dependable people and made for a terrific turnover in staff.

A great deal of difficulty was encountered in getting a reasonable amount of work from the evacuee workmen. This was due to a number of reasons such as the policy of supplying employment for all who wanted to work, lack of understanding on the part of supervisory personnel of the evacuees problem. At some centers evacuee leadership was recruited and given some responsibility which resulted in surprising increases in production. The administration at center level

was plagued with strikes, slow downs, and in some cases a refusal to do certain kinds of work. Pressures were developing among evacuee groups, especially where the leadership was not used, that were very troublesome to the activity responsible for obtaining production. The lack of specific policies and the results of the early employment policies, to a great extent, influenced evacuee labor later on when development plans were more nearly complete and after equipment and construction supplies were available.

In November, 1942 a decision was made by the Director of WRA to abolish the San Francisco office and to move some of the personnel to the Washington office. Thus, in December of that year the Operations Division was abolished in the San Francisco office and reorganized in Washington.

1. Most of the WRA engineering employees who were transferred from the San Francisco office to Washington reported for work soon after January 1, 1943. Upon our arrival in Washington an estimate of the staff requirements for the Engineering Section was, a Principal and a Senior Engineer, a Chief Draftsman who would act in the capacity of an Office Engineer, and two secretaries. There was also at that time a Principal Engineer in charge of the irrigation and road development program. The construction of these projects, however, remained the responsibility of the Engineering Section. Soon after our arrival in Washington, the Irrigation and Roads Engineer resigned and the Engineering Section assumed the responsibilities for irrigation, roads and other land improvement activities that were being carried on in connection with center programs.

Upon our arrival in the Washington office we found the immediate and most pressing problem was that of working with the War Production Board (Facility and Review Committee) to the end that some of the many projects that had been submitted by the San Francisco, Denver and Little Rock offices could be given early consideration and priorities made available for the purchase of materials and supplies so sorely needed to carry on the building and the land improvement programs. A great deal of work remained to be done in connection with land development before agricultural land could be made available for the 1943 crop season.

The agricultural land development program was perhaps the most important of all construction work required at the centers because of the urgent need to produce as much as possible of the food required to feed the evacuees. At our first meeting with the War Production Board a revocation order was issued eliminating all elementary schools with the exception of those planned for Camp I at Colorado River. Most of the school projects had been approved during the fall and early winter and much of the material required for the construction of the elementary schools had been ordered through the U. S. Engineers. It was possible to cancel some of these orders but in most cases the bill of material for the school construction included both high schools and elementary schools, and in some cases material required for staff housing, thus it was necessary to break down the estimates and cancel only that part of materials, supplies, equipment, etc.,

needed for elementary schools. This imposed a terrific burden of extra work upon the project engineering staff and finally resulted in the centers receiving large stocks of supplies that had been ordered for elementary school construction for which orders had been placed and shipment made before the order could be canceled. This material was frozen and was not available for use on unapproved construction projects, stocks of supplies included lumber, paint, millwork, heating, plumbing equipment and supplies and electric lighting and power line supplies and equipment. At some of the centers a great deal of work had been done on the elementary school buildings, since all centers were extremely anxious to expedite as much as possible the school construction program to the end that buildings then being used to house school activities could be made available for residential purposes for which they had been originally constructed, and the crowded condition under which the evacuees were forced to live could be relieved. Likewise, it was necessary to provide housing for staff who in many cases were living in barrack buildings sorely needed to house evacuees. At the six western centers the bill of material, equipment and supplies required to provide staff housing was included in the same estimate with high and elementary schools, adding further to the mix-up in materials brought about by the revocation of the elementary school buildings.

Our contact with the War Production Board was through the Priority Specialist employed by the Supply Section in the Washington office. It was the responsibility of the Supply Section to purchase supplies

and equipment necessary for the construction program and for general center operation. Some of the supplies were purchased through the U. S. Engineers and Quartermaster, others were purchased through WRA advertisements.

During the winter months all of the centers were making special efforts to complete plans and estimates for other buildings so sorely needed. For instance, in all cases, immediate steps were being taken to start hog feeding projects to utilize as much as possible of the edible garbage. The broad spread in climatic conditions encountered in the several centers made this a special problem. At Colorado River and Gila River there was a serious dust hazard it being necessary to sprinkle down feed lots, while at the Arkansas centers the feed lots had to be paved with lumber or concrete, otherwise the hogs would be bogged down continuously in a loblolly of mud.

Evacuee labor was recruited in so far as possible to make plans, and estimates of material required and to draw up building specifications. In many cases high school boys were drafted into this job who had little or no experience in architectural work or in estimating building requirements. Soon after our establishment in Washington we discovered that each estimate provided by the field had to be very carefully checked for minimum design requirements as well as for material requirements because of the use of inexperienced personnel in making original estimates. The War Production Board had checked

many of our early project estimates and found that material estimates were several times the amount actually needed. This applied in general to building supplies that were on the critical list, and made it necessary for the Washington office to start immediately checking the estimates, plans, and specifications to be sure that minimum requirements in planning was followed and that the material estimates were at least fairly accurate. Otherwise the War Production Board returned them to us for correction, thus adding to the delay in obtaining priority of materials that was so sorely needed. In some cases the centers went ahead with their building program using surplus materials obtained from the basic center construction that had been purchased through the U. S. Engineers or the contractor completing some of the construction without waiting to obtain WPB approval and priority. In some cases this developed into a duplication of orders, since when the project was finally approved authority was issued to purchase another order of material that would be placed in stock, adding to the stock of material on hand. It very soon developed that a tighter control of the work program at the several centers was necessary if we were to continue to have the cooperation of the WPB in obtaining priorities for critical materials. The first step in controlling unauthorized construction was to obtain a complete inventory of all construction materials on hand at each center. This inventory was not completed until in the early summer of 1944, at the same time a complete schedule of all completed construction was supplied, indicating cost to date

of materials, the cost of labor, the percentage of completion, and estimate of the cost of labor and material required to complete and an estimate of materials yet to be purchased.

There was still a need for a construction program from each of the centers based on the estimate of the cost of buildings actually required to carry on the program taking into consideration the material on hand. This construction program had been requested from the San Francisco office and a temporary program had been prepared by that office, copy of which was sent to the several centers with a request that it be altered to fit their needs. If funds were not allotted to the several centers on the basis of an intelligently prepared program it developed that there was no control over the expenditure of such funds for project construction that had not been approved by the Washington office or by the WPB and which was not deemed necessary in connection with the carrying out of the approved program of the several centers.

Because of the difficulty in obtaining scarce construction materials there was a tendency on the part of center staff to hoard this scarce, hard to obtain materials. In some cases excessive amounts of materials were purchased under the guise of the maintenance, repair, and operation program for which blanket authority had been issued by the War Production Board. This again made materials available for the construction of projects that did not have prior approval and unless reasonable budget control was exercised later on it became necessary to allot construction funds on the basis of project approved

by the War Production Board taking into consideration the materials that were on hand at the center or that were available for transfer from other centers.

2. Early in the administration of the several centers it developed that because of the temporary nature of most of the construction the use of used and in many cases inferior supplies added a terrific burden to the maintenance and operation staff. This problem increased as the centers became older and included practically all phases of the basic construction. Water lines for instance were installed out of used material that showed evidence of serious leaks soon after the centers were turned over to the WRA by the U. S. Engineers. In many cases water lines were installed without expansion joints thus making extensive repair jobs necessary when severe climatic changes occurred. In general, the construction being of a temporary nature it required immediate and constant maintenance and repairs.

Some of the supports for the elevated water storage tanks showed evidence of failing thus immediate steps had to be taken to reinforce them in order that a total collapse of center water systems could be prevented. At one center the ground water table lowered so rapidly that a serious shortage of water developed before added wells and pumping equipment could be provided. The domestic water installation was based on a per capita requirement of 100 gallons per day. In some cases water consumption reached a maximum of 500 gallons per day thus making it necessary to keep wells and other pumping equipment in almost continuous operation and making it necessary to use standby

pumps and equipment for production. Then, the stored water was reduced to the point where there was not an adequate supply for emergency fire use. At several centers the water contained such a high percentage of lime and other minerals that hot water boilers and pipe lines were soon plugged solid. This caused many boiler failures and added greatly to the burden of maintenance, and was remedied only after water treatment plants were installed. At one center a complete treatment plant had been provided as a part of the barrack construction but no provisions had been made to counteract the scale brought about by the excessive amount of minerals in the water.

The sewage disposal plants were a never ending source of trouble. Many changes in the original installations proved necessary to obtain satisfactory results and to handle the increased volume brought about by the increase in water consumption. Some of the equipment used in the original installation was not suitable for the type of treatment and had been used for the simple reason that it was the only thing available and the operation of the plant could not be delayed. At one center the entire raw sewage and effluent pumping plants had to be replaced before the plant would give satisfactory service--four miles of wooden conduit or flume had to be replaced because of complete failure due to the decomposition of wooden conduit or flume lid. In most cases additional chlorination equipment was required to reduce the bacteria in the effluent to a safe count. The sewage plants generally posed a constant maintenance problem.

A good many of the centers were located in areas that were subject to frequent high winds that blew off tar paper wall coverings and in many cases blew off or damaged the rolled roofing. When the centers were accepted from the U. S. Engineers in the fall and winter of 1942, practically none of the interior insulation (wall board) was in place. This made it necessary for the immediate organization of work crews of center residents and to recruit supervisors in order that partitions and lining could be provided. Many of the evacuees were moved in after winter set in thus the interior insulation became a necessity before the residents could live with any degree of comfort.

There was a large turnover in center engineering staff. These changes encouraged several kinds of major changes in construction and operation plans. Likewise, changes in personnel in other sections such as school, hospital, agriculture, etc., made major plans changes appear to be necessary, adding still further to the burden of the center engineering staff and in some cases delaying WPB approval of projects set up in the construction program. It became necessary to develop a reporting procedure that would keep the Washington office posted on progress being made by the construction staff and that gave a pretty clear picture of utility, maintenance and operation problems and requirements.

It developed during the late winter and spring of 1943 that it would be necessary for the Engineering Section to set up a statistical branch in order that ample data could be accumulated for

use in support of the annual and quarterly budgets and for the purpose of supplying more accurate records. Positions were approved but it was never possible to fill all of the positions and thus obtain the supporting data required for the keeping of statistics in the Washington office. As time went on the need for this kind of record increased and I am convinced that if this kind of program were undertaken again a statistical branch should be set up at the outset and careful records kept of the maintenance and operation activities and of the construction program.

3. Since all of the centers had not submitted a complete estimate of their construction, operation and maintenance program there was no basis for approving quarterly budget estimates submitted by the centers. Immediate steps had to be taken, therefore, to obtain a complete construction operations program in so far as this was possible. Likewise it developed that an inventory of equipment, supplies, etc., was a requirement if intelligent consideration was to be given to the requests for additional equipment and to the problem of exchanging surplus equipment and supplies between the various centers. It was known at this time that some centers had large surpluses that had been obtained from CCC and WPA warehouse stocks and other sources, such surpluses included all kinds of building materials, hand tools and heavy equipment. A great deal of difficulty was encountered in obtaining a complete inventory of equipment and supplies and in keeping

such inventories current. It was never possible to obtain enough trained personnel in the Washington office to keep these records current, nor was it possible to obtain from the field complete records of supplies and equipment on hand to support an exchange program between centers. The surplus stocks of building supplies became such a problem in some cases because of the delay in carrying out planned projects that severe losses were encountered.

4. The problem of maintaining and operating the centers was such that no general pattern could be applied. Generally speaking it was possible to obtain janitorial and operation supplies required for each of the centers. Maintenance supplies, however, were a different kind of problem. Plumbing and electrical repairs and replacements and pump parts were in many cases very difficult to obtain. Most of the centers kept the stock of this kind of supplies to the minimum. Some surplus stocks were accumulated that were later utilized to fill the maintenance needs of other centers. Maintenance tools were a scarce article and were exceptionally difficult to control. It was necessary to issue all classes of tools and maintenance equipment for use by evacuees, who were not accustomed to using such tools, thus shortening the life of the tools and making it necessary to continuously replace broken, worn out and lost tools.

Generally speaking the center staff did an excellent job considering all of the difficulties they were faced with in recruiting supervisory personnel, the organizing and utilization of unskilled workmen who were reluctant to assume any responsibility because of

their peculiar status and also considering the tremendous pressure for work project development by educational, health, administrative and agricultural sections.

5. In late 1944 and early 1945 surplus supplies and equipment became a serious problem at some of the centers. A procedure of transfer between the centers had been pretty well developed and most of the material requirements were being met in that way. There were, however, large supplies of some kinds of materials on hand that were no longer required in connection with our program. It was, therefore, necessary to dispose of many items of material and equipment through the regular established surplus channels. To that end procedure was prepared and circulated to the relocation centers governing disposal procedures. About this time the relocation program gained so much headway that it became evident that it would be necessary to make adjustments in the construction programs planned for several of the relocation centers.

A good many of the buildings planned for school use and other general purpose buildings that were deemed necessary in the early stages of the WRA program were eliminated and surplus barrack buildings made available by the relocation of center residents were used.

The Jerome, Arkansas center was closed in the early part of 1944 and a great deal of the equipment, material and supplies on hand at the time of closing was transferred to other centers to meet their anticipated needs. This added to the large surplus stock in some centers because of rapid changes developing by virtue of the accelerated relocation program that curtailed sharply construction needs and reduced the maintenance and operation material requirements.

6. The announcement of the opening of the west coast to evacuees in January, 1945 led to the promulgation of plans for the orderly closing of all relocation centers on or before December 15, 1945. These announcements were made in the early summer and plans were made to relocate center residents, and to dispose of materials, supplies and equipment and finally to dispose of buildings and plant at the centers. As a result of this announcement all construction activities were curtailed and the maintenance program was reduced to only those buildings that would be occupied or required for the operation of the center until closing time.

As the relocation program progressed large blocks of buildings were evacuated and closed. Surplus property was assembled in an orderly manner for disposition. Equipment storage yards were provided at most centers for the orderly storage of surplus equipment as rapidly as it was no longer required for center operation. It developed that the crating and boxing and the provision of boxes for evacuee property proved to be one of the major work problems facing the Engineering Section during the relocation period. A great deal of difficulty was encountered in the purchase of lumber, nails and equipment required for this work. At other centers there was a surplus of lumber on hand to meet the boxing and crating requirements but the lumber would have to be resawed before it could be used. Some difficulty was encountered in contracting for this kind of service or in obtaining equipment that would permit the resawing of surplus lumber by center workmen. In practically all cases most of the labor

requirements for the boxing and crating program was provided by recruiting evacuees, very little outside labor was employed.

7. In the summer of 1945 instructions were forwarded to the field to be used as a guide in preparing the closing report for each center. Inventories of all buildings, utilities and land improvements were made at all centers as a permanent record. After the center residents had all been resettled one of the major jobs of the Engineering Section was the clean up of the center. After this was accomplished a narrative report of the activity was prepared and the job of providing buildings and maintaining and operating the buildings, utilities and land improvements became history in so far as the Engineering Section of the WRA at the several relocation centers was concerned.

Prepared by C.H. Powers

March 25, 1946