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Guidance on Expediting Remedial Design and Remedial Action

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NOTICE

This guidance was developed by the U. S. Environmental Protection Agency's Office of Emergency and Remedial Response, Hazardous Site Control Division. It has been subjected to the Agency's review process and approved for publication as an EPA document.

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TABLE OF CONTENTS

LIST OF FIGURES

ACRONYMS USED IN THIS GUIDANCE

ARCS	-	Alternative Remedial Contracting Strategy
BAFO	-	Best and Final Offer
BUREC	-	Bureau of Reclamation
CA	-	Cooperative Agreement
CBD	-	Commerce Business Daily
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	-	Code of Federal Regulations
CO	-	Contracting Officer
CPM	-	Critical Path Method
DBA	-	Davis-Bacon Act
DOL	-	Department of Labor
EPA	-	Environmental Protection Agency
ERCS	-	Emergency Response Cleanup Services
GVS	-	Greatest Value Score
IFB	-	Invitation for Bids
OSWER	-	Office of Solid Waste and Emergency Response
PDTS	-	Predesign Technical Summary
PRP	-	Potentially Responsible Party
RA	-	Remedial Action
RD	-	Remedial Design
RFP	-	Request for Proposals
RFTP	-	Request for Technical Proposals
RI/FS	-	Remedial Investigation/Feasibility Study
RMS	-	Remedial Management Strategy
ROD	-	Record of Decision
RPM	-	Remedial Project Manager
SSC	-	State Superfund Contract
TSSB	-	Two Step Sealed Bidding
USACE	-	U. S. Army Corps of Engineers
VE	-	Value Engineering

CHAPTER 1 INTRODUCTION

1.1 PURPOSE OF THIS GUIDANCE

This guidance examines ways to expedite remedial design and remedial action (RD/RA) so that cleanup activities can be completed more quickly. It is intended for use by remedial project managers, remedial design contractors, and others involved in planning remediation activities. It should be used as a means to evaluate whether a project is suited for expediting and to determine the methods that could be used. The guidance is intended as a management approach, not a "cookbook," for planning projects. Each project is unique, and the approach should be tailored accordingly.

In "A Management Review of the Superfund Program," or the Ninety Day Study, Administrator Reilly emphasized a bias for action at Superfund sites. The National Contingency Plan also emphasizes a bias for actions which eliminate, reduce, or control site hazards as early as possible. This guidance emphasizes the same bias--expediting cleanups. It is a complementary guidance to OSWER Directive 9355.3-06, "RI/FS Improvements, Streamlining Recommendations."

Application of the concepts in this guidance should not significantly increase the remedial project managers' workloads. It may, however, increase the remedial design and remedial action contractors' workloads to incorporate and coordinate the approaches.

1.2 DEFINITIONS OF TERMS

The following terms are used in this guidance:

Project - A remedy described in the Record of Decision that must be accomplished. It may be the remedy for an entire site or an operable unit.

Remedial work element - A portion of a project that has been broken out through phasing. This will be a separate contract package for procurement of remedial design work elements as well as remedial action work elements.

Steps - The individual pieces or activities required to complete each remedial work element. The steps are manipulated to fast-track the element.

1.3 OVERVIEW OF THIS GUIDANCE

Chapter 2 discusses the Remedial Management Strategy, or RMS, which is a planning document for the remedial design and remedial action. Careful RD/RA planning is critical to successful execution of a project. The RMS, which is typically prepared by the Remedial Project Manager, is a systematic consideration of the components of remedial design and remedial action. The resultant document is a road map for the design of a project.

As part of the RMS, the RPM, in conjunction with the designer, should consider phasing, which is covered in Chapter 3. Through phasing, a project is divided into separate remedial work elements that can be implemented on different schedules. The chapter discusses criteria for phasing and management issues that should be considered.

Once phasing is determined, Chapter 4 discusses how to fast-track the individual remedial work element. Steps in the RD process can be eliminated or rearranged to accelerate the overall schedule. Techniques to analyze a project for fast-tracking are discussed in detail as well as the suggested approach.

Chapter 5 deals with types of contracts and specifications. The two primary contract types are fixed-price and cost-reimbursement, with variations within these types. Specifications can be performance, design, or brand name or equal. The chapter describes these contract and specification types and considerations for selecting the appropriate type. Also discussed is the distinction between construction and service contracts.

Procurement strategies are discussed in Chapter 6. Different types of work are suited for distinct solicitations. Those described in Chapter 6 are sealed bidding, negotiated procurement, and two step sealed bidding. The process for each solicitation as well as advantages, disadvantages, and schedule impacts are described.

Finally, Chapter 7 describes how to put these techniques and concepts together to expedite RD/RA. It includes flow charts on phasing, fast-tracking, and procurement with explanations of the decision process.

1.4 APPLICABILITY OF THIS GUIDANCE

Although the techniques described in the guidance are directed toward Federal fund-lead projects, the concepts are also applicable to State- and Potentially Responsible Party-lead projects. Some projects are more amenable to acceleration than others. The acceleration techniques covered work best for smaller projects, but they can apply to all projects.

1.5 AREAS THE GUIDANCE DOES NOT ADDRESS

The use of an innovative technology is an important consideration in planning RD/RA. The topic, however, is not specifically addressed in this document but will be the subject of a separate guidance. Innovative technology can, however, be incorporated into the concepts discussed.

CHAPTER 2 REMEDIAL MANAGEMENT STRATEGY

2.1 INTRODUCTION

The Remedial Management Strategy (RMS) is a planning tool for expediting the remedial design (RD) and remedial action (RA). It contains an analysis of the major management considerations required to achieve the goals of the ROD in a timely manner. Preparation of the strategy by the lead agency RPM is essential for the smooth progression of a project through RD and RA.

2.2 PRE-DESIGN PLANNING

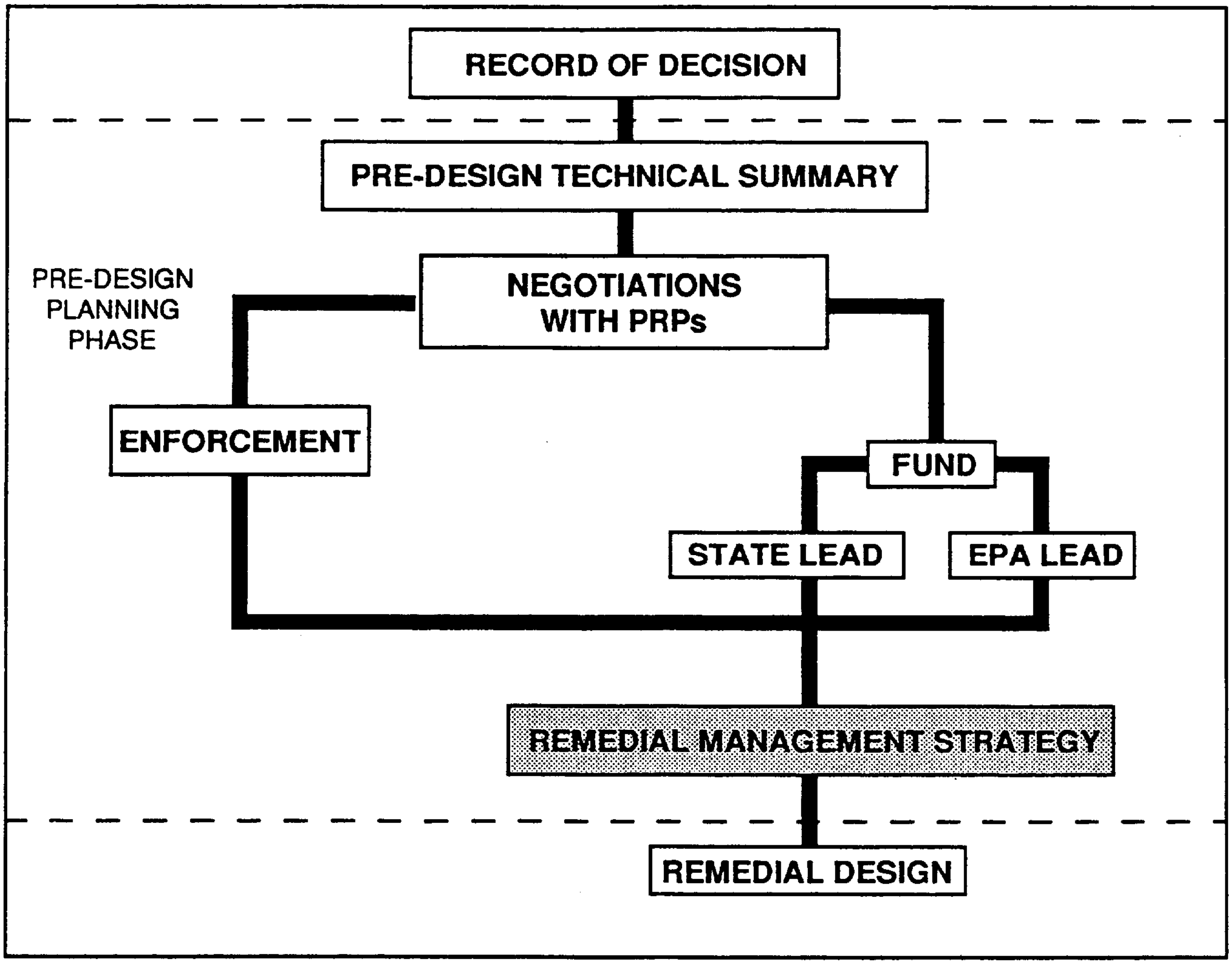
Pre-design planning, as shown in Figure 2-1, moves a project from the Record of Decision (ROD) into the remedial design. During this phase, a Pre-design Technical Summary (PDTS) is developed prior to negotiations with the PRPs to express EPA's technical requirements in design terms. If the response action will be financed by the Fund, a decision must be made as to whether EPA or the State will be the lead agency.

Once the lead agency has been determined, an RMS should be prepared to establish a strategy for managing the remedial design and remedial action. The RMS is a working document for internal use. It is not intended to be cumbersome or difficult to prepare. The RMS length and complexity should be tailored to the nature of the project and kept as brief as possible. The lead agency RPM, with technical assistance from various resources, such as contractors and other agencies, should develop an RMS using the following general guidelines:

- Identify project goals in the ROD.
- Evaluate the project site, including geography, geology, climate, access, local population, utilities, evacuation routes, and proximity of hospital and fire department facilities.
- Review the remedial technology to determine the need for new or innovative equipment, items requiring long lead-time for procurement, operable units, and specialty contractor requirements.
- Develop schedules and budget projections.

FIGURE 2-1

PRE-DESIGN PLANNING PHASE



- Evaluate funding requirements (such as mixed or incremental funding.

- Review health and safety requirements.

- Develop a Remedial Management Strategy that is consistent with the project's goals and constraints.

Section 2.4 explains the RMS in more detail.

2.3 EXPEDITING REMEDIAL DESIGN AND REMEDIAL ACTION

Careful project planning prior to design can yield great dividends in expediting both the RD and RA:

- The selected approach should be coordinated with the projected funding and schedule requirements.

- Early selection of contract options saves both time and money.

- A comprehensive Remedial Management Strategy developed after completion of the ROD will result in a smoother transition to RD and RA by identifying roles and responsibilities.

- An early review of the management risks associated with the project can prevent designer and RA contractor claims and provide for strategies to resolve disputes during the project.

2.4 MANAGEMENT CONSIDERATIONS

Because the significance of individual considerations will vary from project to project, part of the RMS development involves analyzing the relative importance of each of the following factors on the project goals:

- <u>Contracting Party</u>. EPA's RPM must determine, based on EPA policy guidelines, which organization will contract for RD (State, EPA, USACE or BUREC) and the RA (State, ARCS, USACE or BUREC). Once the selection is made, the lead agency RPM should utilize the expertise of contractors and other agencies to help develop the RMS.

- Funding. Funding considerations are of particular concern in the development of a management strategy, particularly if the project is a multi-year effort. The strategy must address the availability of funds including the State cost share and obligations during future years. Interagency funding agreements should be confirmed early to prevent possible delays. The RMS should include budget planning projections based on the proposed project schedule and contract packages.

- Resources. An analysis must be made to determine the special technical qualifications for the work, the workload and availability of the resources required, and the level of interest of qualified contractors.

- Site access. Access to the site is crucial to the implementation of a remedy. A plan should be developed to resolve any site access problems and obtain the necessary rights-of-way.

- Regulations and permits. The RMS should also include, to the extent possible, an evaluation of the logistical elements involving agencies that have jurisdiction over the site such as:

  Federal agencies
  Local planning commissions
  Zoning authorities
  County building departments
  Local water and waste water authorities
  Public utilities (gas, electric, telephone)
  State industrial safety divisions
  Local law enforcement agencies
  Local fire departments
  Traffic and highway authorities
  State environmental offices

- Health and safety. The management of the health and safety program will have an impact on the successful completion of the project. The health and safety program and the protective gear requirements will affect the productivity of the RA personnel and influence the schedule of the project. An estimate of these impacts should be made to provide a clearer picture of the overall duration of the project.

- Phasing and fast-tracking. One of the first items to be evaluated in an RMS is the potential for phasing or fast-tracking the project. These approaches will allow the RA to be implemented sooner than if all of the steps were treated as a single design and remedial action. Chapters 3 and 4 explain phasing and fast-tracking in more detail.

- Equipment. The ROD may specify a process or remedy that requires special or proprietary equipment, particularly if a new or innovative technology is recommended. In these instances, it is important to evaluate the delivery schedule for such equipment. This would include the time necessary to review shop drawings, do performance testing, and for shipping requirements. If these processes are anticipated to take a long time, consideration should be given to purchasing the equipment under a separate contract to ensure its timely delivery to the site.

- Weather. When considering weather, it is necessary to evaluate not only the time of year when the work will occur but also the geographic location. Extreme temperatures or high winds may make execution of a remedial action difficult.

- Design reviews. The importance of reviews cannot be overlooked in planning the management strategy, especially when multiple agencies are involved in the project. EPA, USACE, BUREC, States, PRPs, citizens groups and local agencies may need to provide input at various points along the way. The schedule should reflect the needs of each party so that the project will not be delayed.

- Community Relations. Prior to the initiation of remedial design, the Community Relations Plan may need revision to address any new community concerns anticipated to arise during RD and RA.

- Communications. The best way to communicate to all parties the need for quick response is with a communication matrix, which can be developed as one of the products of the RMS. This matrix shows the procedural flow of information such as submittals, memoranda, documents, and approvals. These communications procedures are agreed to by all parties before the RD begins.

- Disposal issues. Because issues regarding the disposal of materials, such as off or on-site disposal and manifests, can affect the RD/RA process, the RPM should address this element in the RMS. The sooner these issues are addressed, the easier it will be for the designer to prepare the RA documents to reflect the needs of the project.

- Procurement. At this point in the project, it is necessary to consider the RA procurement options that are applicable. Once the number and type of remedial designs and remedial actions have been determined, procurement methods and types of contracts and specifications can be analyzed so that the RPM can formulate a planning approach to procurement. Chapters 5 and 6 cover contracts and procurement strategy in more detail.

- RD and RA Cost and Schedule. The RMS should develop a preliminary schedule for the RD and RA. To assist in the project planning, EPA has developed a series of generic RD schedules that identify tasks, durations, and resources for various types of projects. These standard schedules also account for varying levels of complexity within the project. The schedule developed for the RMS should also identify critical tasks that need to be started early to minimize project delays, give the designer a road map of how the project should be managed, and identify the critical milestones to be met.

2.5 RMS Report

The RMS report should include the following major sections:

- Summary
- Introduction and project description
- Summary of ROD requirements
- Summary of collected information
- Recommended remedial action approach, including a schedule and budget projection for the project
- Description of all issues that remain to be resolved or that require further analysis

The chapters that follow cover in more detail methods to accelerate remedial design and remedial action that could be incorporated into the RMS.

CHAPTER 3 PHASING

3.1 INTRODUCTION

Phasing is the division of a project into meaningful remedial work elements that can be implemented on different schedules resulting in acceleration of the remedial design and remedial action. It allows certain elements of a project to be started ahead of others to lessen the hazards present at the site and to complete simple prerequisite work elements or nonhazardous work elements ahead of more complex and hazardous work elements. Large, complicated projects are separated into smaller, more manageable remedial work elements. Each element can move at its own optimum rate to completion, thereby preparing the site for any further required remediation.

3.2 CRITERIA FOR PHASING

Phasing decisions are based on many criteria, including availability of existing information, type of waste, type of media, technology requirements, and funding availability.

3.2.1 PHASING BY AVAILABILITY OF EXISTING INFORMATION

Assessment of existing information for a site can result in a decision to phase work elements. Where information for part of the site, or one of several media on the site is already sufficient for design to begin, phasing that portion of the work may be appropriate. The decision requires evaluation of available information, such as type, concentration, and physical extent of waste and media affected. For example, if information on one of two media is already available, a work element can be established for the first medium. Also, certain aspects of the design, such as road development or utilities installation, can proceed while data on other aspects of the design is being gathered.

3.2.2 PHASING BY TYPE OF WASTE

Segregation of non-hazardous and hazardous work elements may be a simple criterion for project phasing. The engineering required for the non-hazardous components of a project is frequently more conventional and may lend itself readily to accelerated schedules in RD and RA. Examples are access roads, fences, and provision of site utilities and buildings. In addition, these types of work elements are frequently prerequisites for more complex elements. It may make sense to begin design and construction of these items as early as possible in the project to ensure that their construction does not impact subsequent work and to avoid construction congestion.

3.2.3 PHASING BY TYPE OF MEDIA INVOLVED

It may be desirable to phase different media into discrete remedial work elements to expedite the start of remedial action. For example, if a soil or sludge has contaminated the groundwater, the RD/RA for the source pollution could be addressed separately from that of the contaminated groundwater plume. Remediation of groundwater may be approached by initially installing a limited barrier well/treatment system and then expanding the treatment scheme as more information is obtained. This allows for quick action based upon limited design information with larger scale actions to follow.

Similarly, wastes which are physically separated, although present in the same medium, can be addressed independently as separate remedial work elements in order to phase the RA process. For example, where it may be necessary to excavate contaminated soil from around and under a number of homes, certain areas where access has been obtained could be remediated before others. Or, where several waste ponds are present at a site, one waste pond may be remediated first to ensure the process works satisfactorily.

3.2.4 PHASING BY TECHNOLOGY REQUIREMENTS

Simple remedies can obviously be implemented much more quickly than those requiring detailed equipment design, fabrication, and specialized operation. Excavation of contaminated soil and back filling with clean material can be started without high technology equipment. Conversely, the design, fabrication, erection, and operation of the on-site system to treat the same soil could extend over a several month period. Consequently, it may be best to phase these activities by setting up two contracts. By separating the overall remedy into remedial work elements based on the type of technology to be implemented, the remedial action can be expedited.

Technology requirements may also vary with the media being remediated, such as air stripping for groundwater and solidification for soil. It is reasonable to separate and group media components to allow independent development of RD and RA schedules. This allows each element to be implemented as it is finalized without waiting for completion of the design for another element.

3.2.5 PHASING BY FUNDING AVAILABILITY

Remedial action funding considerations may result in phased RD/RA activities. The availability of federal funds to implement a remedy or the willingness of a State to cost share all or part of the remedy has a definite effect on the type, amount and schedule of work which can be performed. The project may have to be phased using the previous criteria in order to be consistent with available funding strategies. An example would be to fund mobilization and construction of an incinerator as phase one, and fund operation of the incinerator as phase two.

3.3 MANAGEMENT CONSIDERATIONS FOR PHASING

The decision to phase RD/RA activities should include certain considerations with respect to cost, project schedule, quality of product, and community relations.

By phasing, the RD/RA is broken down into smaller, discrete work elements which are more manageable and cost efficient and less subject to changes or cost increases. Cost estimates for subsequent work can be more precisely determined by building on the experience gained from prior work elements at the site. However, there may be redundancy in areas such as the design and procurement process, driving up total project cost. Also, the total cost of the final remedy is not certain until the last work element is implemented.

For scheduling purposes, the time frames for each work element will be less than for the project in its entirety. This situation allows evaluation of schedule trends during the project, thus allowing tighter control of the schedule. Improvement of a project's critical path schedule may be achieved by overlapping work element starts and concurrent actions in design and construction, such as initiating groundwater pump and treatment while source control design is still in progress. Be aware, however, that a project's critical path will not be improved if the phased work elements are not on the critical path.

Quality of individual work element design may be improved because knowledge obtained from prior work elements, or phases, can be integrated into design or operational considerations of subsequent work elements. This advantage does not apply, however, if the work elements are developed concurrently.

If a project is phased, there will be more than one contract to administer. Coordination of several contractors may be difficult, resulting in more administrative burden. Time may be lost and delay costs incurred if one contractor interrupts another's work. Therefore, the RMS should be carefully developed to better manage these projects.

Community perceptions may be improved by taking a phased work element approach, especially if the approach accelerates initial on-site activity. Phasing could help to alleviate concern over a lack of progress on appropriate remedial action.

Phasing can be an effective way to accelerate both a remedial action start and completion at a project site. As can be seen, however, the decision to phase involves an evaluation of many alternatives and considerations. Once the decision to phase is made, fast-tracking of individual phases should be evaluated as discussed in the following chapter.

CHAPTER 4

FAST-TRACKING REMEDIAL DESIGN AND REMEDIAL ACTION WORK ELEMENTS

4.1 INTRODUCTION

Fast-tracking is complementary to phasing. Whereas phasing is the process in which large complex projects are broken into smaller more manageable work elements, fast-tracking is a method to accelerate the implementation of those individual work elements. Fast-tracking techniques manipulate the internal steps required to complete each phased element, thereby optimizing the overall schedule. Depending on the complexity of the project, fast-tracking can be used in conjunction with phasing or by itself to achieve these benefits.

The internal steps to implement a phased element are often interdependent, i.e., some steps will rely on the completion of a previous step and cannot begin until that activity is completed. Other activities may have varying degrees of dependency, and some may be totally unconstrained and scheduled as simultaneous activities without regard to dependency. Fast-tracking techniques, which take these interrelationships into consideration, generally fall into one of the following descriptions:

- Eliminate. Steps in the process are eliminated or shortened. Because steps are often interrelated, however, this technique may create problems later on. For instance, deciding to use existing data previously collected during the RI/FS instead of collecting additional data during the remedial design will expedite the design process. This approach, however, may result in design delays if the RI/FS data turns out to be marginal or incomplete.

- Rearrange. The sequence or timing in which the steps are performed is rearranged to accelerate the overall schedule. An example might be to schedule design reviews in parallel with continuing design work so they are not on the critical path. Using this type of technique is usually done without assuming additional risk as long as no steps are eliminated or shortened.

4.2 PROJECTS AND REMEDIAL WORK ELEMENTS MOST SUITED TO FAST-TRACKING

Most projects can be fast-tracked to expedite their schedules; however, the less complex the project or remedial work element, the more receptive it is to being accelerated by fast-tracking. This is because it is more likely that some standard tasks can be eliminated or shortened. For example, a simple project will probably not require a treatability study or value engineering study. Superfund projects that are more easily expedited typically exhibit the following characteristics:

- Technology. The applied remedy utilizes a proven technology.

- Data requirements. A treatability study is not required (or has already been completed during the RI/FS) and only minimal additional field data may be required.

- Value engineering. Based on the screening, a value engineering study is determined not to be needed.

- Intermediate design. Intermediate design submittal and review are not required. Other design reviews are done in parallel.

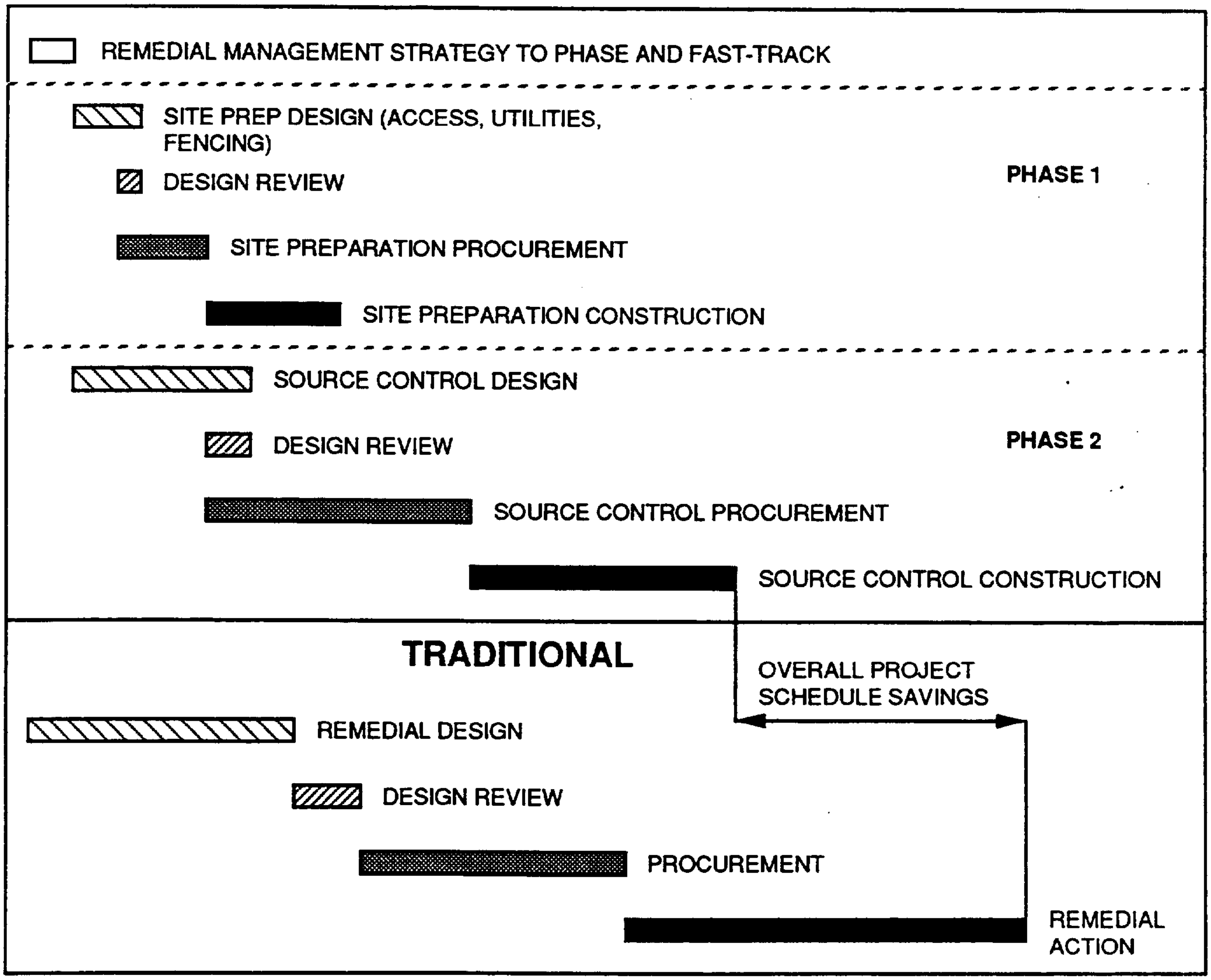
- Long-lead procurement. If long-lead procurement or fabrication is required, it is fast-tracked to keep it off the critical path.

- Real estate. There are no unusual real estate or permit requirements.

Assuming the above project characteristics, Figure 4-1 illustrates the relative time savings that may be achieved by phasing and fast-tracking a project. In the traditional approach, the entire remedial design is completed and then reviewed before initiating procurement. In the fast-track project scenario, site preparation construction is phased out of the remainder of the project using a clean work versus hazardous work criterion, and it is fast-tracked using standard specifications for the clean work. The remainder of the design for hazardous source control continues on the standard route through design. Assuming all design reviews are conducted in parallel, the fast-track procedures not only expedite the

FIGURE 4-1

PHASING AND FAST-TRACKING VERSUS TRADITIONAL RD/RA



This figure illustrates relative time savings that may be achieved by fast-tracking a project. In this example site preparatory work is started with a limited design while the design for the source control action continues. Assuming all design reviews are conducted in parallel, the fast-track procedures not only shorten the time necessary to initiate construction, but also accelerate completion of the project.

construction start, but also accelerate the completion of the project.

4.3 FAST-TRACKING TECHNIQUES

All remedial design and remedial action projects (whether phased or not) can take advantage of fast-track techniques to expedite their schedules. Because each project is unique, however, it is not possible to lay out a generic "cookbook" formula for fast-tracking. Each project should be analyzed based on the requirements and interrelationships of requisite activities. In other words, plan a strategy. The Remedial Management Strategy described in Chapter 2 is a valuable tool for this purpose. The following are some possible techniques that can be used to fast-track RD/RA activities:

- Design requirements. Reduce the detail required in the design package. For many small projects or portions of larger projects (i.e. soil excavation, dismantling of structures, simple pump and treat systems), the design need only include a site layout drawing and a basic description of the work to be performed. This may be contrary to the more conservative approach of providing a design with detailed specifications and drawings, but significant time and design cost savings may result.

- Standard specifications. Use of standard specifications enables completion of remedial designs in significantly less time. Standard specifications are inherently general in order to have a broad range of application. Since this can lead to vagueness when applied to a specific project, standard specifications should be modified as appropriate for the intended use. Various manufacturers, associations, and government agencies have developed standard specifications applicable to Superfund construction projects. Examples include the U.S. Army Corps of Engineers' specifications for remediation of hazardous waste sites, and the American Public Works Association's generic specifications. Use of these or similar specifications instead of, or in combination with, detailed design specifications will simplify and expedite design and equipment procurement activities.

- Specifications from a similar project. Many projects are similar in scope to projects that have already been designed. If these specifications are well prepared, consider providing them to the designer of the new project. The specifications can then be modified as needed rather than starting from the beginning.

- Existing plans. During the scoping phase of a Remedial Investigation, project planning deliverables include a Health and Safety Plan, a Quality Assurance Project Plan, and a Community Relations Plan. Reuse these plans, as they may provide the basis for the doing the same types of plans required for remedial design and possibly the remedial action with little modification.

- Project continuity. For a Fund-lead project, time is saved in the transition from the ROD to remedial design if the same party, i.e., ARCS contractor, does both the RI/FS and the design. This assumes the contractor is qualified, has the available resources for the work, government regulations do not prohibit such work distribution, and there is no real or apparent conflict of interest. The benefits are that the EPA already has a working relationship with the firm, personnel are familiar with the project, and the firm has an established project file containing relevant documents and information.

- Site access. When agreements for RI/FS site access are developed, structure them to also allow for access during remedial design and possibly remedial action activities. Access and real estate concerns can be very time consuming and complicated. If these issues can be addressed in a comprehensive manner early in the project, they will pay significant time dividends later on.

- Value engineering. If a value engineering study is required, schedule to keep it off the design critical path. The only potential time impact from such a study should be caused by a design change, not from the value engineering process itself.

- Parallel design reviews. Schedule all design reviews in parallel with continuing design work so they are not on the critical path. Do all reviews simultaneously to expedite the resolution of recommendations.

- Early initiation of remedial action. Prepare remedial action work assignments before completing the remedial design. The first few weeks of a remedial action work assignment are spent doing activities (i.e., preparing the remedial action work plan and collecting existing site information) that are not dependent on a completed remedial design. When the design is completed and approved, the procurement process can begin without delay.

- Long-lead equipment. Identify in advance any equipment that requires a significant amount of time to procure. Order in advance, if possible, to ensure that the item does not affect the critical path for the remedial action.

- Fast-track construction/staging. Many large projects can be divided into separate stages of construction. This is generally accomplished by letting each stage of work out for construction as soon as the design effort on that particular stage of work has been completed. This approach has the advantage that the project will be started and completed sooner than would be possible if it were necessary to wait until all design work had been completed. However, when multiple contracting efforts are underway simultaneously, more coordination and administrative oversight is required.

4.4 SUGGESTIONS TO IMPLEMENT FAST-TRACKING

Fast-tracking is a useful method to expedite a project or a remedial work element. The following suggestions may be helpful to the RPM when devising a fast-tracking strategy:

- Develop a strategy. Make a flow diagram which illustrates the tasks, durations, and precedence for the elements required by the project. A Gantt Chart is a simple example of such a diagram. Computer software is available which is simple to use, incorporates the use of classic scheduling techniques and concepts, provides various report features, and integrates graphic elements. Use the flow diagram as a project road map which can be kept current by adding and deleting elements as they are identified. This map will identify the critical path of the project and help ensure that non-critical steps do not become critical.

- Communicate. Communications are crucial because fast-tracking requires numerous concurrent activities which will be occurring with parallel and concurrent review steps. Thus, expedited schedules will afford fewer defined stop-and-check points. Regular project communications (meetings, reports, and verbal) among appropriate decision makers or their representatives are necessary to eliminate false starts or misdirected activities.

- Target areas to fast-track. The areas most conducive to fast-tracking are the pre-design and design steps. During this time, most of the activities can be expedited. All can become critical if ineffectively managed (especially treatability studies, field data acquisition, EPA reviews, permits, and real estate). On the other hand, typical remedial action activities are less flexible because these activities may be constrained by procurement and contracting requirements discussed in Chapters 5 and 6.

- Identification of tasks. Identify all the tasks of a project that need to be fast-tracked. An overlooked task can become critical and delay or halt the project.

- Evaluate approach changes. When potential shortcuts in the remedial design or remedial action process are identified, weigh them prudently. Sometimes these shortcuts may have a hidden agenda. Eliminating or circumventing a step during design may significantly delay the project during remedial action.

The fast-track techniques described in this chapter can significantly expedite the remedial design and remedial action of a project. In many cases they are easy to implement and can be applied to all projects.

CHAPTER 5 CONTRACTS AND SPECIFICATIONS

5.1 CONTRACT TYPES

The enormous scale and complexity of procurement has necessitated the development of a wide variety of contract types. The appropriate contract type to use is based upon a project specific determination during the development of the RMS. The term "contract type" has several different connotations. Here it is used to indicate the methods of pricing arrangements, of which there are two primary types, fixed-price contracts and cost-reimbursement contracts.

5.1.1 FIXED-PRICE TYPE CONTRACTS

Fixed-price (unit price, lump sum, or a combination of the two) type contracts provide for a firm price for the supplies, services, equipment, or construction being acquired. In fixed-price type contracts, the total contract price is adjusted only when required by a supplemental agreement to the contract.

A lump sum (firm fixed-price) contract is an agreement to pay the contractor a specified price in return for certain specified performance. The price paid is not subject to adjustment due to actual costs incurred within the scope of the contract. The contractor's profit or loss is related entirely to his ability to control costs. This type of contract places the maximum risk and cost responsibility upon the contractor, but also provides the contractor opportunity for increased profits. Because the contractor's costs incurred are not a factor in determining compensation under the contract, the administrative costs to both the contractor and the contracting party are kept to a minimum.

The lump sum (firm fixed-price) type contract is used when detailed specifications are prepared and whenever fair and reasonable prices can be established at the outset. This type of contract is especially suited to the acquisition of supplies, services and construction when realistic cost estimates can be made. If, however, detailed specifications are not prepared, the use of a lump sum (firm fixed-price) contract is not appropriate. The reason is that most contractors would place a significant contingency factor in their contract price to cover fluctuations in labor or material costs, or to protect themselves from their inability to accurately estimate the costs.

In a unit price contract, the quantity required is indeterminate, but a reasonable estimate is known, and definite specifications are available for the units to be purchased. The selection of the contractor is based on his price for the estimated quantities, and payments are made based on actual quantities purchased. That is, the actual sum to be paid is the total determined by the quantity of work actually performed calculated from the unit price agreed to in the offer. The burden is on the contracting party to ensure that the estimated quantities are a reasonably accurate representation of the actual anticipated needs in light of relevant factors and past experience. The estimated quantities should offer a reasonable probability that award to the lowest offeror will, in fact, result in the lowest ultimate cost to the contracting party.

5.1.2 COST-REIMBURSEMENT TYPE CONTRACTS

The cost-reimbursement type contract provides for payment to the contractor of all (or sometimes a portion of) his allowable, allocable, eligible, and reasonable costs. In addition to costs, most cost-reimbursement contracts also provide for the payment of a fee (profit) to the contractor. Cost-reimbursement contracts establish an estimate of total cost for the purpose of obligating funds and establishing a cost ceiling.

Cost-reimbursement type contracts are suitable for use when the nature and complexity of the procurement is such that the costs of performance cannot be estimated with the accuracy necessary for a fixed-price contract (i.e. detailed plans and specifications cannot be prepared).

5.1.2.1 INCENTIVE TYPE CONTRACTS

Incentive contracts are designed to harness the profit motive to stimulate the contractor to perform at a lower cost, to furnish a better product or service, or to cut down lead time in delivery dates. The goal when utilizing incentive contracts is to motivate contractors to strive for excellence throughout contract performance. Incentive contracts fall into two categories: those where the quality and efficiency of contractor performance are determined on an objective basis (by formula) and those where the quality and efficiency of contractor performance are determined in a subjective manner pursuant to an evaluation plan. The fixed-price incentive contract and the cost-plus-incentive-fee contract are examples in the objective category, while the cost-plus-award-fee contract (such as ARCS) is the main type in the subjective category.

5.1.2.2 TIME AND MATERIALS TYPE CONTRACTS

The time and materials contract (such as ERCS) provides for the acquisition of supplies, services, equipment, and construction on the basis of direct labor hours at specified hourly rates and materials at cost. It is used when it is not possible at the time of placing the contract to estimate the extent or duration of the work or to anticipate costs with any substantial accuracy. This type of contract places a significant management burden on the contracting party.

5.2 SPECIFICATIONS

Specifications are included in the contract documents and contain a description of the technical requirements to be met and the criteria for determining whether these requirements are met. The description should contain the essential physical characteristics and functions required to meet the minimum needs of the contracting party, not the maximum desired. Also, the manner in which the needs are specified must achieve full and open competition with due regard to the nature of the supplies, services, equipment, or construction to be procured.

All specifications must be clear, complete and definite as well as not be unduly restrictive. Although specifications are restrictive by their very nature, to avoid being unduly restrictive, they must be reasonable and necessary to meet the actual needs of the contracting party. Also, specifications must include all significant factors (including price) which the contracting party expects to consider in evaluating sealed bids or competitive proposals and the relative importance assigned to each of these factors.

The types of specifications include performance (functional), design (detailed), and brand name or equal. The performance specification is preferred and tends to be more easily and quickly prepared. It permits a variety of products or services to qualify and contains the range of acceptable characteristics or the minimum acceptable standards. Performance specifications can sometimes result in the use of new technologies.

Using performance (functional) specifications is neither a panacea compared to design specifications, nor free from considerable effort to draft or evaluate. Bonding, insurance, warranties, guarantees, and cost escalation risks may constitute impediments to the use of performance specifications. Potential contractors interpret the specifications, and they provide a variety of proposals to satisfy the needs of the contracting party. More often than not, performance specifications rather than design specifications are used in negotiated procurement because of the flexibility during negotiations.

The design or detailed specification contains a complete and exact description of what is required. A limitation of design specifications is that the contracting party implies a warranty that if the contractor follows the specifications, the contractor is not responsible for failure of the final product.

The least acceptable manner to identify the requirements of the contracting party is by use of a brand name or equal specification. This specification should only be used when it is impractical or uneconomical to make a clear and accurate description of the technical requirements. All known brands that meet the required need should be cited. Also, the specifications should list the essential characteristics, oriented to the minimum needs of the contracting party, which will be used to objectively evaluate the equality to the named brand(s).

5.3 NATURE OF THE CONTRACT

The EPA defines remedial action to mean those actions consistent with the permanent remedy taken in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment. Remedial action can include activities at the location of the release such as storage, confinement, neutralization, cleanup of released hazardous substances and associated contaminated materials, recycling or reuse, diversion, destruction, segregation of reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, on-site treatment or incineration, provision of alternative water supplies, and any monitoring reasonably required to assure that such actions protect the public health and welfare and the environment.

It should be noted that not all of the activities contemplated as "remedial actions" are considered the performance of "construction." Some can be considered as the performance of "services."

5.3.1 CONSTRUCTION

The Department of Labor (DOL) defines "construction" to mean construction, alteration, or repair (including dredging, excavating, and painting) of buildings, structures, or other real property. For purposes of this definition, the term "buildings, structures, or other real property" include improvements of all types, such as bridges, dams, plants, highways, parkways, streets, subways, tunnels, sewers, mains, power lines, cemeteries, pumping stations, railways, airport facilities, terminals, docks, piers, wharves, ways, lighthouses, buoys, jetties, breakwaters, levees, canals, and channels.

CERCLA requires that all laborers and mechanics employed by contractors or subcontractors in the performance of construction, alteration, or repair work funded in whole or in part under Section 104 of CERCLA be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the DOL in accordance with the Davis-Bacon Act (DBA). The DBA provides that Federal contracts and subcontracts for the construction, alteration, or repair (including painting and decorating) of public buildings or public works shall contain provisions regarding the wages to be paid and how they are paid. The DBA is also applicable to construction, alteration, or repair done under a Superfund Cooperative Agreement.

The Federal Acquisition Regulation and EPA's regulations governing Superfund Cooperative Agreements (41 CFR 31.36) require performance and payment bonds for any construction contract exceeding $25,000. This requirement may be waived by the Federal contracting officer or EPA's award official provided the Federal government's financial interest is adequately protected. Generally, the requirement for a performance and payment bond is waived for cost-reimbursement type construction contracts.

5.3.2 SERVICE

A service contract directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task. It can cover services performed by either professional or non-professional personnel whether on an individual or organizational basis. Some of the areas in which service contracts are found include the following:

- Maintenance, overhaul, repair, servicing, rehabilitation, salvage, modernization, or modification of supplies, systems, or equipment
- Routine recurring maintenance of real property
- Construction or repair of personal property
- Consulting services
- Engineering and technical services
- Operation of government-owned equipment, facilities, and systems
- Transportation and related services
- Research and development
- Chemical testing and analysis
- Data collection, processing, and analysis services
- Exploratory drilling (other than as part of construction)
- Geological field surveys and testing
- Laboratory analysis services
- Landscaping (other than as part of construction)
- Surveying and mapping services (not directly related to construction)
- Transportation of property or personnel
- Solid waste removal
- Tree planting and thinning, and clearing of timber or brush
- Dismantling, demolition, or removal of improvements (if not followed by construction).

Generally, performance and payment bonds are not required for service contracts. However, performance bonds may be required when necessary to protect the Government's interest.

5.3.3 APPLICATION

The distinction between construction contracts and service contracts for remedial action can be quite difficult to discern when determining whether the DBA applies. The DOL has ruled that any contract with $2,000 or more of construction-type work is covered; however, the General Accounting Office (GAO) looks to the contract as a whole and has sustained decisions of the contracting party not to apply the DBA.

A contract for clearing timber or brush from land or for the demolition or dismantling of buildings or other structures located thereon may be a contract for construction activity subject to the DBA, where it appears that the clearing of the site is to be followed by the construction of a public building or public work at the same site. If, however, no further construction activity at the site is contemplated, the DBA is considered not applicable to such clearing, demolition, or dismantling work.

Instances may arise in which, for the convenience of the contracting party, instead of awarding separate remedial action contracts for construction work subject to the DBA and for services of a different type to be performed by service employees, the contract may include separate specifications for each type of work in a single contract calling for the performance of both types of work. For example, offers may be solicited for the construction of a pump and treat system or an incinerator, as well as its operation and maintenance. The installation is considered to be construction covered by the DBA; whereas, operation and maintenance is a service and not covered by the DBA.

Also, the provisions of the DBA would apply to parts of a remedial action contract involving both construction and service work although the contract is principally for services. The DBA would be applicable to the construction work in such a hybrid contract where:

- The remedial action contract contains specific requirements for substantial amounts of construction, reconstruction, alteration, or repair work, or it is ascertainable that a substantial amount of construction work will be necessary for the performance of the contract. (The word "substantial" relates to the type and quantity of construction work to be performed and not merely to the total value of construction work as compared to the total value of the contract).

- The construction work is physically or functionally separate from, and as a practical matter is capable of being performed on a segregated basis from, the other work called for by the contract.

Selecting the appropriate contract and specifications go hand in hand with determining the procurement strategy for the project, which is discussed in the following chapter.

CHAPTER 6 PROCUREMENT STRATEGIES

6.1 INTRODUCTION

The strategy for expediting procurement methods is to match the appropriate procurement method to the type of work being procured. For example, the fastest procurement is when sealed bidding is used to procure work for which standard specifications are available. The time required to put together the invitation for bids is short because it simply involves joining standard contract documents to standard specifications along with a description of the work. Standard specifications are available for a broad variety of work including such items as water mains, wells, pumping systems, some treatment processes, and various types of earth work. If these items are part of a project, then the expediting strategy should include the possibility of separating them out and procuring them through sealed bidding.

On the other hand, sealed bidding can be a slow method of procurement if used for complex work for which standard specifications do not exist. The slowness is caused by the need to develop detailed design specifications in-house. Under these circumstances, it may be faster to use the negotiated procurement method with performance specifications, which require less technical detail. The contractor then submits within his proposal a plan for the development of detailed specifications after the award of the contract. Therefore, the award of the contract for complex work will usually occur sooner if the negotiated procurement method is used. Another procurement method discussed below, two step sealed bidding, is similar to negotiated in this respect; that is, it is suitable for complex work for which no standard specifications exist.

Considering the above discussion, one time-saving procurement method is to look for significant work elements which can be procured early by way of sealed bidding with standard specifications. This can done be at the same time that requests for proposals (RFPs) are being developed for the more complex portions of the project. In this manner, the appropriate procurement method is matched to specific type of work with the result that each work element is awarded in the shortest possible time. This assumes that the various elements of work are large enough to warrant separate procurement actions, and that construction schedule issues are taken into consideration. The following is a description of the essential features of each solicitation method.

6.2 SEALED BIDDING

The sealed bidding procurement method provides an opportunity for all qualified contractors to compete for the work on the basis of price. The work must be described in detail so that bidders fully understand what is required of them for the price of their bids since the bids become the basis of a fixed-price contract. The description must also be clear to ensure that all bidders understand the work and are bidding on an equal basis. For these reasons, sealed bidding is done on the basis of design specifications and detailed plans.

6.2.1 PRESOLICITATION

Plans and specifications are completed before the work is advertised. They are included in the bid package in the invitation for bids (IFB) along with the terms and conditions of performance. The length of time required to prepare the complete bid package depends on the nature of the work. For simple projects, such as excavation or water main installation, standard specifications can be used thereby decreasing the effort and time to complete the bid package. Detailed plans and specifications for more complex technologies may require considerable effort and time to complete before sealed bids can be solicited.

6.2.2 SOLICITATION AND RECEIPT OF BIDS

The IFB is advertised in construction journals and the Commerce Business Daily (CBD). The bidders submit their bids in sealed envelopes at a prescribed location no later than a specified date and time set for a public bid opening. At that time, the bids are opened and read. The apparent low bid is announced.

6.2.3 BID EVALUATION

The low bid is evaluated to ensure that it is "responsive", that is, that it complies with all the terms and conditions of the IFB and contains no irregularities in the cost and price information. Next, the "responsibility" of the bidder is evaluated. Responsibility is the bidder's ability to accomplish the work with regard to financial resources, bonding, facilities and equipment, record of performance, and ability to comply with the required schedule.

6.2.4 AWARD

The contract will be awarded to the lowest "responsive and responsible" bidder. If the contractor fails to enter into a contact at that point, then he forfeits any bid guarantee, and the agency will award to the next lowest qualified bidder. After contract award, a notice to proceed is issued with dates set for the period of performance. From this point on, the contractor is responsible to perform the work as described in the contract. Any changes in the work can be accomplished only by modifying the contract through supplemental agreements or change orders while the work is in progress.

6.2.5 ADVANTAGES OF SEALED BIDDING

One advantage to the contracting party in sealed bidding is that the method encourages price competition. All bidders are placed on an equal basis through the bidding process. Additionally, sealed bidding shifts the risk involved in the construction of the project towards the construction contractor. The contractor's bid is his promise to accomplish the required work for a specific dollar amount. Since the contracting party has taken the time and effort up front to describe the work in great detail, the contractor knows precisely what is required of him when placing the bid. Any changes will be handled through change orders, but the work bid on will have to be accomplished as bid. The contractor is allowed relief, however, if unusual site conditions are encountered or the work is delayed by the contracting party.

Sealed bidding is the preferred method of solicitation in Superfund projects where the work is relatively easy to define. The installation of drinking water wells and water mains will most often be by sealed bids. Excavation and hauling projects will also be considered for sealed bid solicitation. More technologically complex work, such as thermal destruction projects, will more likely be solicited through negotiated procurement.

6.3 NEGOTIATED PROCUREMENT

Negotiated procurement differs from sealed bidding in each phase of the solicitation. In the initial phase, the contracting party is not required to develop detailed design plans and specifications. Performance specifications are more common to negotiated procurement. The basis of the evaluation is a combination of technical merit and cost, rather than cost alone. Some of the risk of performance of the contract shifts back to the contracting party since the detailed plans and specifications which are developed by the contractor are approved as technically acceptable by the contracting party before award. The following is a description of some of the high points of negotiated procurement.

6.3.1 PRESOLICITATION

Unlike sealed bidding, where the contracting party will put a great deal of effort up front to develop detailed design plans and specifications, for negotiated procurement, the major effort is in the development of performance specifications and a source selection plan.

Performance specifications state the requirements of the project in terms of what must be accomplished and to what level or standard. The offerors who wish to compete to do the work will develop in their proposals the methods, materials, detailed plans, and specifications required to meet the performance specifications.

6.3.2 SOLICITATION AND RECEIPT OF PROPOSALS

An RFP is advertised in the appropriate journals and the CBD. The RFP contains the performance specifications and a description of the evaluation criteria. The relative importance of the technical criteria and cost will be stated, as will the basis for award.

6.3.3 EVALUATION OF PROPOSALS

The evaluation involves an assessment of the cost, technical acceptability of the proposal, and the ability of the firm to accomplish the work. The cost and technical evaluations are done separately then combined to come up with a total value score. Proposals are then categorized as, (1) technically acceptable, (2) susceptible to being made acceptable, or (3) unacceptable. A competitive range is determined which includes all proposals that stand a reasonable chance of being successful. Theoretically, it is possible to award a contract without discussions on the basis of the initial proposals if technically acceptable proposals are received. For large projects, however, the evaluation is usually just the first step in the process.

6.3.4 DISCUSSIONS

After the initial evaluation of proposals, discussions are held with contractors in the competitive range. The goal of the discussions is to raise as many proposals as possible into the acceptable category and thereby ensure maximum effective competition. During discussions offerors are advised of deficiencies, uncertainties, and suspected mistakes in their proposals so they have an opportunity to submit the necessary revisions. These discussions can be at arms length, simply informing the firms of the deficiencies and allowing them to revise as best they can, or they can be of a bargaining nature over the terms of the final offer. In no case, however, should discussions involve "technical leveling" of proposals by repeatedly pointing out weaknesses, or "technical transfusion" by disclosing information between competing proposals. Neither are any "auctioning" techniques allowed such as indicating a price that must be met to continue to be considered, or indicating the relative standings of the various offerors.

6.3.5 BEST AND FINAL OFFERS

After the completion of all discussions, the contracting party is required to solicit best and final offers (BAFOs) from acceptable offerors in the competitive range. These BAFOs are submitted in such a manner that no further discussions will be required. Technically, the discussions could be reopened after BAFOs, but this is highly undesirable since having numerous BAFOs leads to technical transfusion. Final scores are determined on the basis of BAFOs.

6.3.6 SOURCE SELECTION AND AWARD

Once the final scores are calculated, the proposal with the greatest value score (GVS) regarding cost and technical merit as described in the RFP can be selected for award of a contract. The source selection official, however, is not strictly bound by the point scores or recommendations of the selection board. It is possible to take into consideration the significant difference in the technical merit and the cost of proposals of different scores. This type of analysis is called a "technical tradeoff analysis," since technical merit is traded off against differences in cost and scores. Any such tradeoff analysis must be supported by the established evaluation criteria in the RFP.

6.3.7 ADVANTAGES OF NEGOTIATED PROCUREMENT

Negotiated procurement makes available to the contracting party the technical expertise of the industry in developing the approach to accomplishing the work. It relieves the contracting party of the need to develop detailed plans and specifications for complex technologies for which in-house staff may not be available. It also allows for a greater weight to be placed on the technical aspects of the projects. This approach is useful in the solicitation of treatment processes, new technologies, or where there are a variety of acceptable solutions to a particular problem. The disadvantage of negotiated procurement is that the procurement action can become long and involved and, therefore, should not be used for simple elements of work.

6.4 TWO STEP SEALED BIDDING

Two step sealed bidding (TSSB) is a procurement method for which offerors first submit proposals without cost information in response to a request for technical proposals (RFTP), then submit sealed bids on their own proposals if those proposals have been found acceptable in accordance with the RFTP. This method of procurement attempts to combine the advantages of both competitive negotiation and sealed bidding, but has attributes that differ from each. The objective of TSSB is to encourage contractors to submit proposals for alternative technologies and products in step one. The proposals are then evaluated in accordance with established technical criteria. Those proposals which are determined to be acceptable can then be used as the basis of a sealed bid in step two. The offeror bids on his own proposal. The Government selects on the basis of low bid, thereby gaining the advantage of price competition.

6.4.1 TSSB STEP ONE

The objective in step one is to determine the compliance of the proposals with the established criteria of the RFTP. This is a go or no go situation rather than a competitive range determination. All proposals are categorized as; (1) acceptable, (2) reasonably susceptible of being made acceptable, or (3) unacceptable.

6.4.1.1 UNACCEPTABLE PROPOSALS

Proposals must comply with the essential requirements of the specifications, but not all the details of the specifications. The difference between a detail and an essential requirement is not always apparent. This provides great discretion to the CO in determining whether or not a proposal is acceptable. This is a characteristic of TSSB that can easily result in protests, a possible source of considerable delay.

6.4.1.2 PROPOSALS WHICH ARE ACCEPTABLE, OR SUSCEPTIBLE TO BEING MADE ACCEPTABLE

Regarding acceptable proposals and proposals that can be made acceptable, there is no duty to initiate or continue discussions or clarifications. The CO may proceed to step two without discussions if there are two or more proposals that are acceptable as submitted. However, the receipt of two or more proposals which are acceptable as submitted does not prevent the CO from deciding to hold discussions with other offerors who have proposals that are susceptible to being made acceptable. Generally, it is in the CO's interest to hold discussions to ensure the greatest number of bids in the second step. Additionally, firms excluded from submitting a bid in step two after having expended considerable time and money in responding to the RFTP will be inclined to protest.

6.4.2 STEP TWO

In general, step two is conducted as a sealed bidding procurement. There are some differences, however, between TSSB step two and regular sealed bidding which need to be considered as follows:

- The bidding is limited to those who have successfully completed step one. The bidders are required to comply with the specifications and the technical proposal as developed in step one.

- The bidder must comply with the RFTP and also meet any additional requirements of the IFB, such as price, schedules, delivery requirements, and bid bond. There may, however, be a "presumption of responsiveness" that limits the CO's ability to disqualify bids. This presumption results from the time, effort, and money required to participate in TSSB. The Comptroller

General has allowed bids to stand as responsive in TSSB when these same bids would have been eliminated in regular sealed bidding.

- Due to the need for the CO to safeguard step one proposals against disclosure to unauthorized individuals in accordance with FAR 14.503-1(c), competitors have no way to determine whether or not the proposal accepted differs from the RFTP. This violates the public opening concept of sealed bidding as required in FAR 14.404-4. Normally, a bid is nonresponsive if it includes restrictions prohibiting competitors from knowing the essential elements of the products offered with regards to quantity, price, and delivery terms.

6.4.3 ADVANTAGES OF TWO STEP SEALED BIDDING

TSSB has advantages similar to negotiated procurement in that it allows the owner to accept proposals for alternative technologies and products; however, it retains in the last step the cost competition of a sealed bidding environment. It should be kept in mind that the use of TSSB requires care to ensure that offerors understand the ways in which it differs from conventional methods to avoid unmerited protests. Also, COs and owners need to understand that in exchange for the increased cost competition of the sealed bidding, they surrender the prerogative to consider in the basis of award the relative technical merit between differing proposals. The disadvantage of TSSB is similar to negotiated procurement in that it should not be used for simple or standard work.

6.5 SCHEDULE IMPACTS OF PROCUREMENT STRATEGIES

The methods of procurement discussed above each have different impacts on remedial design and remedial construction schedule. In sealed bidding, the major demands in terms of time and resources occur during the design phase. This occurs because sealed bidding procurement requires the development of detailed design specifications before bids are invited. Once the detailed specifications are complete, however, the actual procurement phase is relatively straightforward and usually shorter than the negotiated procurement phase.

In negotiated procurement, on the other hand, there is not the same effort needed during the design phase to develop detailed specifications. Instead, the specifications are performance specifications. The companies that desire to do the work are required to develop the detailed specifications as part of their proposals. This shifts a major technical effort to the industry and can lead to less time and effort being expended before the procurement phase. The procurement phase for negotiated procurement, however, tends to be longer than sealed bidding due the fact that the evaluation process is more involved, and more than one round of negotiations is usually required before the BAFOs can be made.

Two step sealed bidding has schedule characteristics similar to negotiated procurement because performance specifications are used and the evaluation is more involved than sealed bidding. Also, there can be several rounds of discussions before sealed bids are requested.

It is usually not practicable to compare sealed bidding schedules to negotiated procurement schedules because the methods lend themselves to different types of work. There may be projects, however, where the choice is less well defined. For these, the selection of one method over the other can lead to time savings in the early stages of the schedule.

CHAPTER 7 PHASING/FAST-TRACKING ANALYSIS

7.1 INTRODUCTION

This chapter serves as a brief illustration of the relationship of phasing and fast-tracking considerations that might be encountered during the planning of a project. It presents examples of generic flow chart diagrams for the decision making process associated with phasing and fast-tracking. These diagrams are not intended to be complete and exhaustive representations of the analytical process and all the considerations involved in expediting an RD/RA project. They are, however, presented to demonstrate the nature of the decision making process associated with such an analysis and the interrelationship of the two techniques of phasing and fast-tracking.

The flow chart diagrams are presented to demonstrate the relationship of various considerations that might be encountered during project planning. It is quite possible that the order of actual considerations may differ from those presented in the figures. It is also possible and likely that any given project might present specific opportunities for schedule optimization that are not presented here. The charts depict a general flow process from top to bottom and are not intended to depict the relative duration of process pieces by scale representation. For individual projects, some pieces of the analysis may require intricate technical assessment. Others may be so obvious that decisions are evident after brief contemplation and can be assessed concurrently with other considerations.

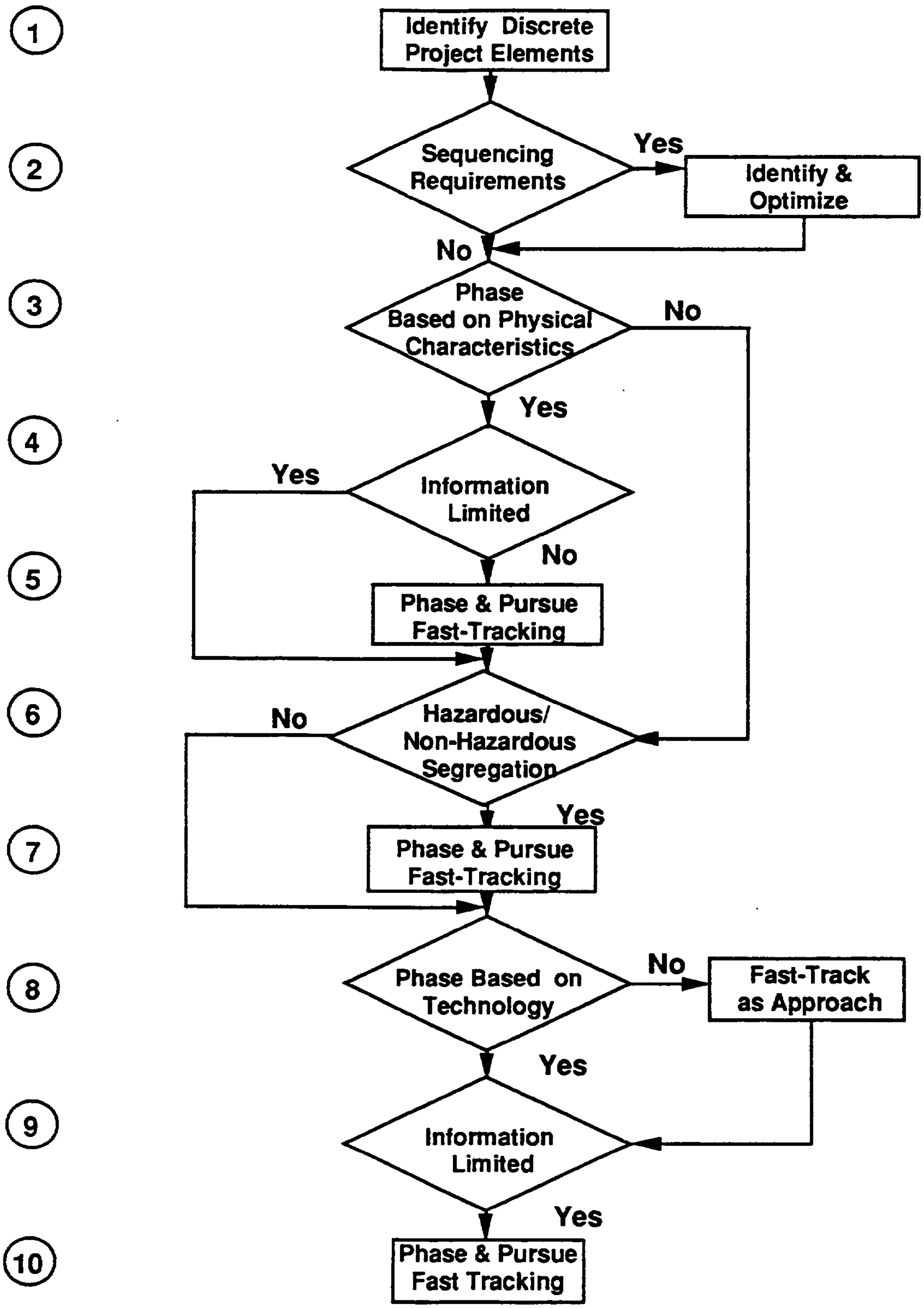
7.2 PHASING ANALYSIS

The process depicted in Figure 7-1 represents the type of considerations generally encountered during phasing analysis. Comments regarding the process correspond to the line reference numbers on the figure.

1. Segregate the project into discrete elements that can be defined to an extent that permits implementation on separate tracks.

2. Identify any timing relationships that may exist between individual elements. For example, does an access road need to be completed before additional field activities can be started? After the

FIGURE 7-1
PHASING ANALYSIS



relationships between the individual elements are defined in terms of sequence requirements, they should be analyzed for optimization of implementation. A critical path method (CPM) analysis is a useful tool for this purpose.

3. The potential for phasing based on physical criteria should be considered. Do specific physical characteristics of a project element increase its potential for successful segregation from other project elements and acceleration of the schedule for implementation? For example, consider source control versus ground water treatment, or perhaps treatment of a physically separated mound of contaminated material located on site. A favorable finding with respect to this criterion may result in an opportunity to expedite some aspect of the project.

4. If the analysis is favorable with respect to phasing based on a given criterion, the next consideration should be to determine the information requirements that are prerequisite to implementing the phasing. Ideally, all information and data requirements for RD/RA would be a product of the RI/FS. This may not be the case. If the information needed with regard to the phasing scheme would result in a large time schedule demand, it may negate the benefits of phasing based on the considered criteria. For example, if addressing the separate mound of contaminated material requires extensive and time consuming characterization, it might not warrant segregation for phasing purposes. If additional requirements preclude the practicality of phasing, conventional methods should be followed for that project element.

5. If a favorable assessment is rendered regarding phasing criteria and considerations, fast-tracking analysis should then be applied. See section 7.3.

6. Frequently, aspects of a project that address hazardous material involve more complex and time demanding efforts to address technical information or regulatory requirements. For this reason, it is generally advisable to segregate project elements that deal with non-hazardous materials. This distinction may present itself as a straightforward consideration for phasing potential.

7. If a favorable assessment is rendered regarding phasing criteria and considerations, fast-tracking analysis should then be applied. See section 7.3.

8. The technology employed within a given project element may also be a useful criterion for assessing phasing potential. In the simplest example, conventional technology such as earth moving might present a more easily implemented procedure than, say, some form of in situ treatment. For a complex site, it may come down to assessing the relative schedule demands of employing various technologies.

9. If the analysis is favorable with respect to phasing based on a given criterion, the next consideration should be the information requirements that are prerequisite to implementing the phasing. Ideally all information and data requirements for RD/RA would be a product of the RI/FS. This may not be the case. If the information needed with regard to the phasing scheme would result in a large time schedule demand, it may negate the benefits of phasing based on the considered criteria.

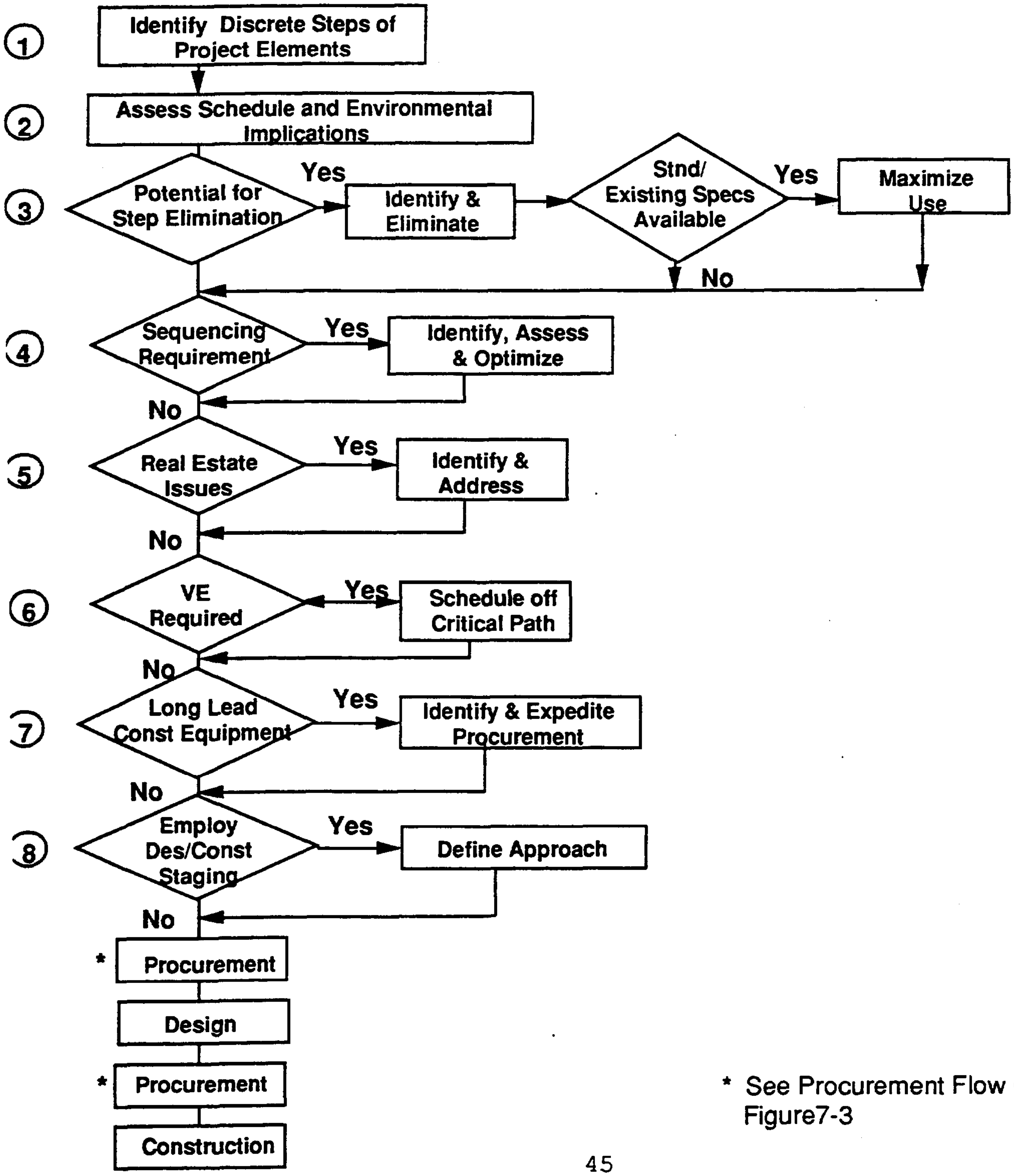
10. If a favorable assessment is rendered regarding phasing criteria and considerations, fast-tracking analysis should then be applied. See section 7.3.

7.3 FAST-TRACKING ANALYSIS

The process depicted in Figure 7-2 is intended to present the type of considerations generally encountered during fast-tracking analysis. Fast-tracking should be considered for a project up front. This presentation represents the process as a subset of phasing considerations. It should be pointed out that even if a project does not lend itself readily to phasing, fast-tracking analysis should still be considered. For purposes of this presentation, assume that the fast-tracking analysis is for a phased element of a project. As with the preceding section, comments regarding the process correspond to the line reference numbers on the figure.

1. Steps are the discrete activities that, in total, comprise the implementation of a remedial work element. Their definition allows a finer level of analysis to be applied to expediting considerations.

FIGURE 7-2
FAST TRACKING ANALYSIS
(Assumes Prerequisite Phasing Analysis)



* See Procurement Flow Chart Figure7-3

2. Inherent in the process of expediting a project is the acceptance that some form of potential cost growth or schedule slips may occur. Protection of environmental values should be kept in mind during all decision-making processes within the expediting process.

3. Any steps within the project element that can be eliminated should be. A specific area which might present a large potential for time savings is design. Maximum use should be made of standard or existing design specifications where applicable.

4. Sequencing requirements as they apply to the steps within an element should be identified and factored into the optimization plan.

5. Real estate issues, such as access and acquisition requirements, must be identified early in the process because of their potential to delay the project schedule. They can essentially be considered as a specialized sequencing constraint.

6. If the results of a value engineering (VE) screen are positive, steps should be taken as early as possible to see that the VE analysis is scheduled to have minimum impact on the project schedule.

7. Any equipment requirements that present long-lead or special procurement problems should be identified as early as possible in the process so that attainment will not adversely impact the schedule.

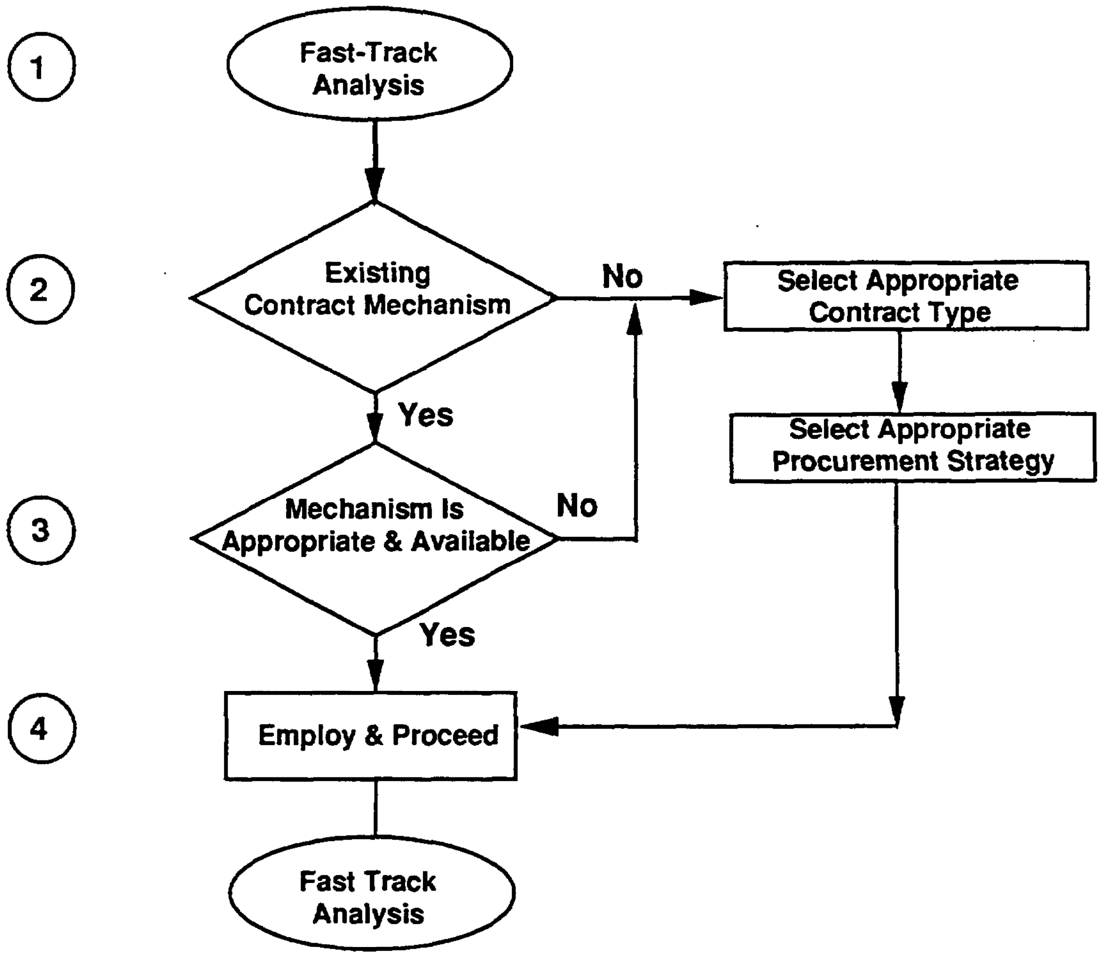
8. The potential for design/construction staging should be assessed and, if appropriate, optimally employed. (See Chapter 4, section 4.3)

The following comments refer to Figure 7-3 and its relation to preliminary RD/RA procurement considerations:

1. This figure assumes previous phasing and fast-tracking analysis.

2. When the procurement stage is reached for RD/RA, the decision must be made whether to make use of an existing contract mechanism or procurement of a new on one. The former approach offers a potential for time savings.

FIGURE 7-3
PROCUREMENT



3. While maximum use of existing contract mechanisms may be desirable, this may not be a viable option in some cases. These contracts may be subject to capacity or scope constraints. If this proves to be the case, schedule requirements should be reconsidered in the context of a contract mechanism. The advantages and disadvantages of various contract types and procurement strategies are presented in Chapters 5 and 6, respectively.

4. Upon consideration of the appropriate factors, the approach should be chosen and implemented expediently so that additional fast-track considerations can be addressed.

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