Section IX – Selected Plan

This section presents the rationale for selection of the recommended plan. It further presents a description of the plan, environmental and cultural considerations, optimum project timing, financial information, and design and construction schedule.

1. Summary of Final Plans

This study investigated in detail two alternative lock sizes and a congestion fee in combination with the without-project condition (WOPC). The two lock sizes considered are 75 feet wide by 400 feet long and 110 feet wide by 600 feet long. Except for the size of the new lock chamber and approach walls, the major features of the locks are the same. Each new chamber would be riverward of the existing lock and downstream of the dam. The existing lock would remain in operation during construction, but would permanently close after completion of the new lock. This also applies to construction of the replacement-in-kind lock that would include a congestion fee. The rationale for plan selection and details of the tentatively selected plan are discussed in the following paragraphs.

2. Rationale for Plan Selection

The five study objectives are (1) continued and reliable navigation, (2) minimize maintenance closures, (3) reduce lockage-transit times, (4) facilitate safe and efficient movement of traffic, and (5) conserve fish and wildlife, recreation, and cultural and natural resources. A complete discussion of the study objectives is found in Section V, Plan Formulation. Each of the two lock alternatives meets all five of the study objectives. The congestion fee combined with the WOPC also meets the objectives. The two alternative lock sizes are economically feasible and have significant net benefits (cost reductions). However, the congestion fee combined with the WOPC is not economically feasible and has negative net benefits of $77,000 (See Table IX-1).

Principles and Guidelines states that the recommended plan must provide the maximum net NED benefits, that the

NED plan must be the selected plan unless there is some overriding reason for selecting another plan, and that the recommended plan must have incremental benefits in excess of incremental costs (a positive incremental cost reduction when compared to the without-project condition). Traditionally, this has been described as a plan, which has a benefit-to-cost ratio above unity.

Table IX-1 Summary of Annual Costs, Benefits, and Net Benefits for Alternative Plans (Cost Minimization Framework) (Thousands of FY 2001 Dollars; 6.375 Discount Rate)

Item	WOPC W/ Congestion Fee	75'x400'	110'x600'
Investment Cost[1]	$ 17,682	$ 18,771	$ 20,465
Non-Construction Costs:			
Helper Boats	3,175	1,506	1,485
Maintenance	2,601	2,601	2,586
Repair	179	179	179
Recreation	27	27	27
Transportation	318,478	311,067	310,106
Less Congestion Fee Revenues	-5,954	0	0
Fee Administration	30	0	0
Subtotal, Non-Construction Costs	$318,506	$315,380	$314,383
Total Annual Costs	$336,188	$334,151	$334,848
Net Benefits[2]	$ -77	$ 1,960	$ 1,263

[1]Includes Interest During Construction
[2]Total Annual Costs for WOPC less Total Annual Costs for Alternatives

Table IX-1 displays the net benefits for the final plans. The 75'x400' lock has the highest net benefits, with $1,960,000 and therefore is the NED plan. The 75'x400' lock satisfies study needs, opportunities, and objectives as discussed in Section VIII. It reduces the average transit time from the expected 13.7 hours per tow in 2010 to 8.2 hours in 2010. While the WOPC average transit time grows to an estimated 53.5 hours per tow in 2060, the 75'x400' lock's transit time is 6.0 hours per tow with the use of helper boats. The 75'x400' lock is more efficient than the WOPC, and facilitates safer transit through the project. By having a maximum of six lockages per tow, it reduces significantly the number of lockages per tow over the WOPC. This improves efficiency and reduces the risks of accidents while at the lock.

Over the long term, the 75’x400’ lock provides benefits to air quality, noise, and aquatic resources. River traffic is able to reliably transport larger quantities of goods, thus fewer numbers of trucks and railcars will be required. This results in improvements to air quality and less noise.

The 75’x400’ lock will require fewer cuts or breaks of the tows than the WOPC. Little damage to riverine ecosystems is caused by a tow moving in line with the channel. When the tow is cut, however, the towboat must maneuver side to side. The propeller wash that is directed to the side disturbs the bottom and suspends sediment with adverse effects to water quality and to aquatic life. Further, many tows push into the banks (toe) to hold the tow in place while they are either cutting the tow apart and while waiting for other tows to clear the lock. Toeing into the bank also negatively affects the water quality and aquatic life.

There are many advantages why the 110’x600’ may be considered to outweigh the economic advantage of the 75'x400' lock (the net annual benefits for the 75'x400' lock exceed those of the 110'x600' lock by $0.7 million).

Of the five study objectives outlined in Section IV and discussed further in Section VIII, the 110’x600’ satisfies three of the five to a much greater extent than the 75’x400’ lock. Both lock sizes equally address the objectives of continued and reliable navigation and of minimizing maintenance closures.

The 110’x600’ lock is superior in addressing the third study objective of reducing lockage-transit time. Table VI-4 displays the expected average transit times for the two lock sizes. Transit times for the 75’x400’ lock range from 8.2 hours per tow in 2010 to 13.9 hours per tow in 2050. During the same time period, the 110’x600’ lock has estimated transit times from 2.1 hours per tow to only 2.4 hours per tow. By the year 2060, the average processing times for the 75’x400’ are reduced to 6.0 hours per tow, but requires the use of two helper boats to accomplish this reduction in processing time. No helper boats are required for the 110’x600’ lock.

The 110’x600’ lock is also superior in addressing the fourth study objective of facilitating safe and efficient

movement of traffic. As discussed in Section VIII, the 110’x600’ lock is intuitively safer because of the few cuts required for a tow to process through the lock. The fewer times a tow has to be taken apart and then reassembled, the smaller the risk of an accident. The maximum cuts per tow for the 110’x600’ lock is two, while the maximum cuts per tow for the 75’x400’ lock is six. Fewer cuts also mean less maneuvering of the towboat is required. This would reduce the likelihood of accidents in and around the lock.

Fewer cuts in the tow lowers processing times when compared to the WOPC. In this area, the 110’x600’ lock has a distinct advantage over the 75’x400’ lock. Processing times are reduced for the WOPC year 2010 of 13.7 hours per tow to only 2.1 hours per tow for the 110’x600’ lock. While the WOPC grows to 53.5 hours per tow by 2060, the 110’x600’ lock only grows to 2.4 hours per tow. The 75’x400’ lock has processing times that range form 8.2 hours per tow in 2010 to 13.9 hours in 2050. A reduction to 6.0 hours per tow is realized for the 75’x400’ lock in 2060 by the addition of helper boats. This reduced processing time for the 110’x600’ lock is partially responsible for the overall reduction in transportation costs of commodities to and from the Upper Tennessee. The 110’x600’ lock provides $961,000 more per year in transportation cost savings over the 75’x400’ lock.

The last study objective is conserving fish and wildlife, recreation, and cultural and natural resources. As discussed in Section VIII, the 110’x600’ lock provides better environmental benefits than does the 75’x400’ lock. In the long term the 110’x600’ lock will provide the greatest benefits to water and air quality, noise, and aquatic resources, as well as to socioeconomic factors. Taking into account all the factors, the 110’x600’ is selected as the environmentally preferred plan.

Other evaluation criteria stipulated in the Principles and Guidelines are completeness, effectiveness, efficiency, and acceptability. Both lock alternatives are considered “complete” in that no further action is necessary to ensure the realization of the planned effects.

“Effectiveness” as discussed in Section VIII, refers to the extent to which an alternative alleviates specified problems and achieves desired outputs. The 110’x600’ lock is considered more effective since it would provide greater

lock capacity and a greater reduction in transportation costs.

"Efficiency" refers to the extent to which an alternative is the most cost-effective means of alleviating the specified problems and achieving the desired output. While the 75'x400' lock is the most cost-effective of the alternatives considered, the difference in net benefits between the 75'x400' and 110'x600' lock is only $697,000. The difference in initial construction costs between the two lock sizes is less than $26 million or only 10.7 percent.

The fourth criteria of "acceptability" refers to the viability of an alternative plan as viewed by federal, state and local entities and the general public, and its compatibility with existing laws, regulations and public policy. Several letters supporting construction of a new 110'x600' lock at Chickamauga have been received in response to the Corps' public announcement of intention to prepare a supplement to TVA's 1996 FEIS. These letters strongly supported the larger lock over the smaller 75'x400' lock alternative.

A fact not included by either the study objectives or evaluation criteria but considered important to the navigation industry, is compatibility with existing projects and industry equipment. The 110'x600' lock is compatible with all the downstream Tennessee River main chamber locks which (with the exception of the 1,000 foot chamber at Pickwick Landing). The 110'x600' lock size is also compatible with lock chambers on the Ohio River to Pittsburgh, PA and on the Upper Mississippi River. The 110'x600' lock is also compatible with the towing industry's standard 15-jumbo barge tow. The 110'x600' lock will pass this tow in a straight double lockage while the 75'x400' lock will require six lockages.

While the tanker barge (52'x290') accounts for only a small percentage of barges at Chickamauga Lock, the 75'x400 lock limits them to on barge per lockage. Four super tanker barges can be processed through the 110'x600' lock in a single lockage. This could become important if barge sizes continue to get larger. The 110'x600' lock matches the standard lock normally found in the inland waterway system and lends itself to handling changes in barge sizes better than the non-standard 75'x400' lock. In fact, the

existing 60’x360’ lock at Chickamauga was designed to process four standard barges (26’x175’) which were the barge size predominantly used when Chickamauga Lock was constructed in the late 1930’s. Over the years, this size barge has disappeared from the Tennessee River. The same thing could happen to the jumbo barge over the next 30 to 50 years.

3. Plan Description

The recommended plan provides a replacement lock, 75 feet wide by 400 feet long, at the Chickamauga Project. The lock would be located on the riverside of the existing lock and downstream of the existing dam (see Figure IX-1). The downstream location would allow use of the dam as an upstream water barrier during construction of the new lock. The riverside location for the new lock would cause the permanent loss of three spillway bays, requiring the removal of three gates and a portion of two concrete piers. Part of downstream approach wall to the existing lock would also be removed.

To provide a downstream water barrier during construction, a sheet pile cofferdam connecting the dam and existing lock would be constructed (See Figure IX-2). A temporary bascule-type drawbridge would be constructed across the lower approach to the existing lock to provide access to the new lock construction site within the cofferdam. After the cofferdam is removed, the bascule bridge would be relocated to provide a permanent access bridge to the new lock. Vertical and horizontal clearances and operational procedures for the bridges would require approval by the U.S. Coast Guard.

Upstream and downstream lock approach walls would be built on the spillway side, with the downstream approach wall extending under and through the Norfolk Southern Railway Bridge. Approximately 1,000 feet of the navigation channel would be widened immediately downstream of the Norfolk Southern Railway bridge. Two new 30 foot diameter mooring cells would be built downstream of the new lock.

The State Road (SR) 153 bridge across the lock would remain open during construction, and Lake Resort Drive would be relocated (See Figure IX-3). As part of the relocation of Lake Resort Drive, two new bridges would be built, one

over North Chickamauga Creek and one for grade separation between Lake Resort Drive and the permanent access road to the North Chickamauga Creek Greenway. Improvements would be made to the intersection of Access Road and Lake Resort Drive.

The existing lock operation building would be demolished. The new lock operations building would be a three-level structure with the top level serving as the operations center, the middle level as a visitor area and assembly room, and the lowest level as an electrical equipment and transformer room.

Figure IX-4 shows the construction site modifications; spoil disposal and "laydown" (temporary storage) areas, road relocations, and access that would be used if a new lock were constructed at Chickamauga Dam. Primary vehicle access to the facility will be across the existing bridge over North Chickamauga Creek. The existing visitor's parking lot adjacent to the earthen dam will be used as part of the construction laydown area. The existing visitor overlook will be removed and replaced by a new overlook adjacent to the existing lock's lower miter gates.

A new 80-car parking area will be constructed on earth fill adjacent to the overlook. The fill will bring the parking facility up in elevation to allow better access for the physically handicapped and will facilitate better access to the area. The parking lot will be curbed and sidewalks will be provided. A new lock operations building will be located on the land wall of the new lock (see Figure IX-2, site plan).

A two-lane road will connect the Hixson Greenway area to the lock access road. It will pass under relocated Lake Resort Drive using the same bridge provided for construction access to the spoil disposal area. Figure IX-3 shows the proposed new location of Lake Resort Drive. Traffic counts show that most of the flow from Lake Resort Drive continues onto Access Road during the morning peak. Similarly, during the afternoon peak the majority of commuters on Access Road continue eastbound onto Lake Resort Drive. Hence, the new road network would be dominated by an east-west arterial that would cross North Chickamauga Creek over a new bridge. This arrangement would separate the through traffic from the site. This plan was recommended by the City of Chattanooga Highway Engineering Department. It would allow for

temporary closure during construction of the existing bridge over North Chickamauga Creek to the public.

This bridge would become the point of construction access. The limited space available for a batch concrete plant would be maximized by this layout. Access to the spoil site north of relocated Lake Resort Drive would be under a second small bridge.

Regardless of the lock's size, Lake Resort Drive must be relocated. Construction of the concrete batch plant and support facilities dictates the road relocation.

The Corps and TVA would continue to monitor the structural integrity of the existing lock until the new lock is operational and the current lock is decommissioned. This action would make the structure a safe water barrier. Once the lock was closed, a portion of the lock chamber and the associated wall culverts would be plugged with concrete. The upper and lower miter gates would be removed. Walls would be strengthened by post-tensioning, and wider slots would be cut in the approach walls to prevent problems from continued concrete growth. Miscellaneous equipment and buildings would be removed. No cofferdams would be required; however, installation of needle dams (similar to a cofferdam but more temporary) and dewatering of the chamber would be required.

4. Environmental Considerations

As discussed in prior sections, several environmental design features have been included in the design of this project. The disposal area will avoid an area where the endangered plant, mountain skullcap, is located. In fact, a tree canopy buffer will be maintained between the disposal area and the endangered plant's habitat.

Other terrestrial areas disturbed by construction activities will be replanted or reforested to minimize long-term losses.

Before any activities are taken below the dam, all mussels will be collected and relocated to unaffected areas. This will minimize the impact of widening the lower approach channel to the existing lock as well as construction of the cofferdam and lock.

The new filling and emptying system will be designed to facilitate the migration of certain fish species through the lock.

Through these environmental design features all foreseeable negative impacts will be either avoided or minimized. In some cases, the environment may be improved over the long term. No compensatory mitigation will be necessary.

5. US Fish and Wildlife Recommendations

In the Draft Fish and Wildlife Coordination Act Report for the Chickamauga Dam Navigation Lock Project Hamilton County, Tennessee Dated November 2001, the US Fish and Wildlife Service presented the following conclusions and recommendations.

"The preferred alternative, with protective measures incorporated, should avoid or minimize significant adverse impacts to fish and wildlife resources in the Chickamauga Dam tailwater and downstream areas. Additionally, protective measures will avoid adverse impacts to terrestrial resources in areas adjacent to the construction site that will be used as disposal and equipment staging areas. We would support implementation of the preferred alternative provided that the protective measures are implemented and strictly enforced."

6. Cultural Resources Considerations

Construction of the proposed lock will have an adverse effect on the Chickamauga Lock and Dam complex and may adversely effect as yet unidentified or unevaluated historic structures (the Norfolk and Southern Railroad bridge) and archeological sites. Adverse effects to historic properties will be addressed and taken into account by stipulations within a Memorandum of Agreement prepared pursuant to requirements at 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act.

7. Coordination

a. Environmental. Environmental evaluations of potential impacts from the various alternatives being considered have been and continue to be coordinated with appropriate federal and state agencies. The primary agencies involved in natural resource issues are the U.S. Fish and Wildlife Service (USFWS) and the Tennessee Wildlife Resources Agency (TWRA). Project review is being conducted primarily under the auspices of the Fish and Wildlife Coordination Act. Endangered species issues were addressed according to provisions of the 1973 Endangered Species Act, as amended. In addition, TVA, the U.S. Coast Guard (USCG), and USFWS are cooperating agencies for the Environmental Impact Statement and Supplement. All significant environmental review events are being closely coordinated by official points of contact established by the Nashville District, TVA, USCG, and USFWS.

b. Cultural Resources. Based on record/archival checks and field reconnaissance, no historic properties (archeological sites) were found in the existing lock parking area and the proposed disposal site on TVA property adjacent to the North Chickamauga Creek Greenway that would be affected by construction of any of the alternatives being considered. Shoreline disposal of dredge material at Nickajack Reservoir (TRM 468.8R) would also not affect historic properties.

The upper portion of the Dupont construction laydown area contains undisturbed soil strata and may contain archeological deposits in buried contexts. Archeological survey of this area will be required prior to use.

All proposed alternatives would have an adverse effect on the Chickamauga Lock and Dam complex, a property that has been determined eligible for listing in the National Register of Historic Places.

All of the construct new lock alternatives include a downstream approach wall that would extend beyond the Norfolk and Southern Railroad Bridge. In addition, at least one of the support piers of the bridge would be surrounded or wrapped by metal sheet pilings to protect it from inadvertent collisions by barges. The National Register eligibility of the bridge has not been evaluated. Although the actual structure of the bridge will not be

directly affected by the approach wall construction, the visual context of the bridge will be affected. An evaluation of the National Register eligibility of the bridge and an assessment of adverse effect will be required before a Record of Decision can be signed.

Resulting work will adversely affect properties that are eligible for listing in the National Register of Historic Places. The Advisory Council on Historic Preservation has been notified and the Tennessee State Historic Preservation Officer (SHPO) is being consulted to determine how such adverse effects can be taken into account by avoidance, minimization, or mitigation. Due to the presence of prehistoric archaeological remains, consultation with Native American Tribes has been initiated. In accordance with requirements at 36CRF § 800.6, the Corps of Engineers proposes to address the adverse effects of lock replacement within the context of a Memorandum of Agreement (MOA) amongst the Corps of Engineers, the Tennessee Valley Authority, and the Tennessee State Historic Preservation Officer. The MOA will stipulate 1) measures that will be implemented to avoid, minimize, or mitigate potential adverse effects on historic properties including the Chickamauga Lock and Dam complex and other potential historic properties, including archeological sites, 2) requirements for additional archeological survey and testing, and 3) requirements for archeological monitoring during certain aspects of construction.

8. Optimum Project Timing

As discussed in Section V, a timing analysis for the replacement–in-kind as a component of the without-project condition was conducted. The economic analysis was adjusted to reflect completion of the replacement-in-kind (RIK) for 2015, 2020, and 2025. The results showed that the net annual incremental benefits decreased as the online date for the lock moved further into the future. Thus, the optimum timing for the RIK was 2010. The same would hold true for any replacement lock. Therefore, no additional timing analysis was conducted for the 75’x400’ lock. The optimum timing for the 75’x400’ lock is 2010.

9. Project Financing

In accordance with Section 102 of the Water Resources Development Act of 1986 (Public Law 99-662), as amended, one-half the costs of constructing the recommended plan will be paid from amounts appropriated from the general fund of the Treasury and one-half from the Inland Waterways Trust Fund. The term construction in this specific case is defined to include post-feasibility level planning; engineering and design; surveying; acquiring all lands, easements, and rights-of-way; and accomplishing all relocations, disposal of materials, and fish and wildlife mitigation. Proposals to modify or rehabilitate elements of the inland and coastal waterways system of the United States, defined by Section 206 of the Inland Waterways Revenue Act of 1978, as amended, will recommend financing on this basis. Operation and maintenance costs on all inland and coastal waterways are 100 percent Federal, pursuant to Section 102(b) of the Water Resources Development Act of 1986.

10. Economic Considerations

The construction cost of the selected plan is $239.4 million ($241.4 million less feasibility study costs of $2 million). The total investment cost, including $39.9 million in interest during construction, is $281.3. Annual economic costs are $22.5 million and include $2.6 million for operation and maintenance of the new lock. The existing lock will be permanently closed. All costs were prepared in FY 2001 dollars. Annual investment costs were computed using an interest rate of 6.375 percent and an economic life of 50 years. The annual investment cost over and above the without-project condition is $1.1 million.

Contingencies were assigned by the cost engineer based on the risk and/or uncertainty of each individual bid item estimated. Higher contingencies were assigned to the items that had the least design development or a higher anticipated risk factor associated with construction. Contingency is applied at the bid item level of the cost estimate. The resulting contingencies for the recommended plan averaged 15.4 percent.

The incremental annual benefits for the selected plan total $3.0 million. This includes $1.4 million in transportation savings and $1.6 million for elimination of

helper boats at Chickamauga. Utilizing the traditional framework methodology (See Table VII-5), the incremental benefit to cost ratio is 2.8 to 1.0.

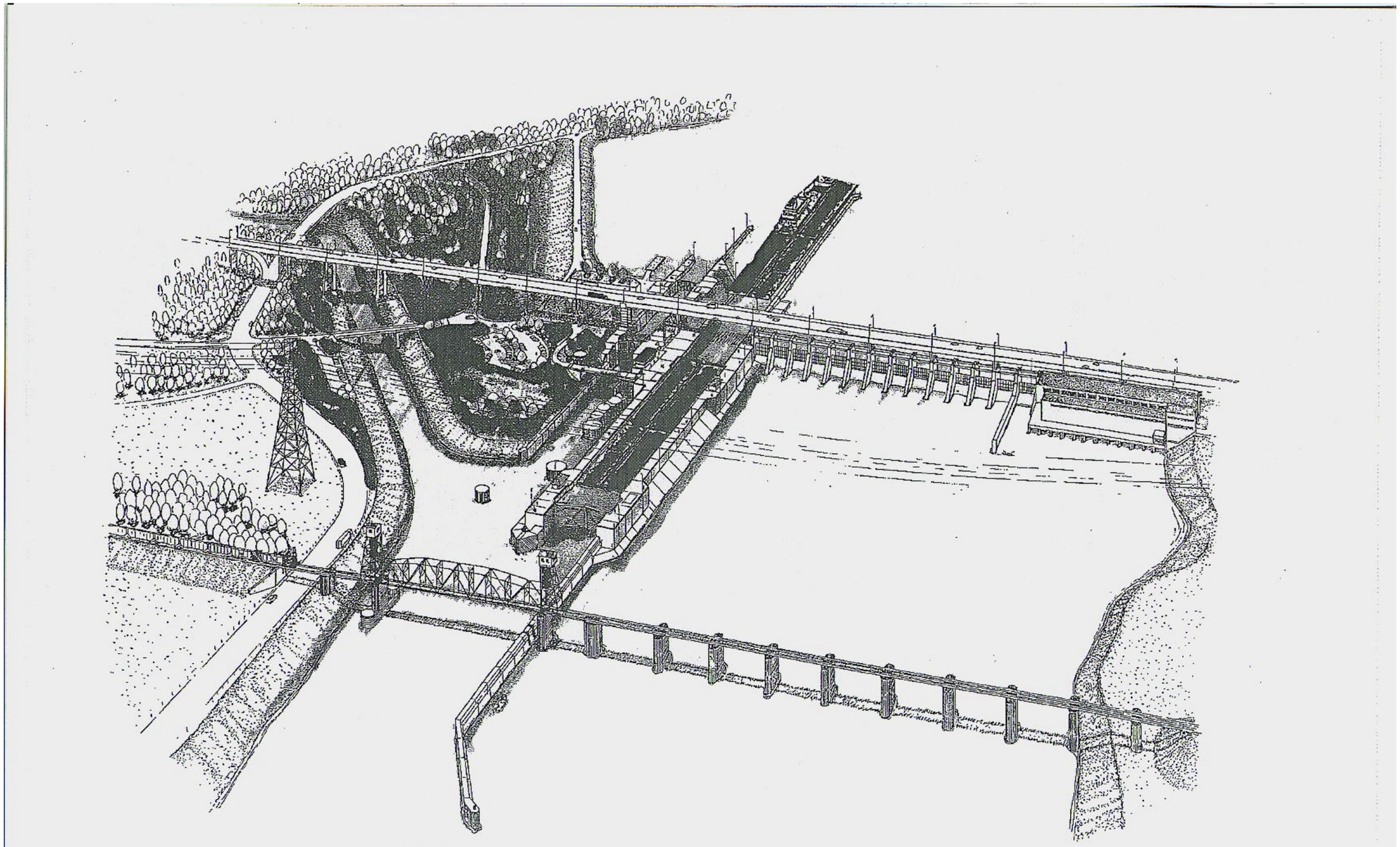
11. PED and Construction Schedule

a. General – The project management team has reviewed input to this study and provided the necessary Independent Technical Review (ITR). Schedules and cost estimates are based on MCACES estimates and network analysis with input from each element involved. This analysis covers all aspects of the project from the feasibility report, through pre-construction, engineering, and design (PED) and project construction.

The PED estimate includes all costs necessary to prepare for project construction of the first construction contract, including plans and specifications. The cost estimate is based on a feasibility level of design to provide a high degree of confidence. Confidence in both the estimate and the recommended plan presented allows PED to proceed directly from the feasibility report to detailed design reports (DDR's). In addition, innovative design analyses to further reduce costs will be undertaken early in the process. It is very unlikely that any additional information would affect plan evaluation or site selection. As shown in Figure IX-5, the PED schedule runs two years and assumes funds are available in FY 2002. The construction schedule runs seven years and assumes construction funds are available in FY 2004.

b. Design Memoranda and First Plans and Specifications – Detailed design reports (DDR's) will be initiated in FY 2002 for cofferdam construction and for lock construction. This work will focus heavily on geotechnical design and to a lesser extent on analysis of the hydraulic modeling. Additional borings and channel mapping will be completed. Borings will cover the proposed highway alignments, bank excavation, lock features and cofferdams. Analysis of the existing TVA models at their Norris, Tennessee laboratory and evaluation of data collected to date will be conducted to study and refine the design of the lock. Separate DDR's will be prepared for the utilities relocations, highway relocations, structural properties and design considerations, cofferdams, and lock structure. Planning will also be initiated for utility relocations, road

relocations and downstream excavation in FY 2002. The first DDR completed will be for utility relocation and this contract will be awarded in FY 2004. Project completion is schedule for April 2010. The construction schedule is presented in Figure IX-6.



LOCK ADDITION • CHICKAMAUGA RESERVATION

FIGURE IX-1

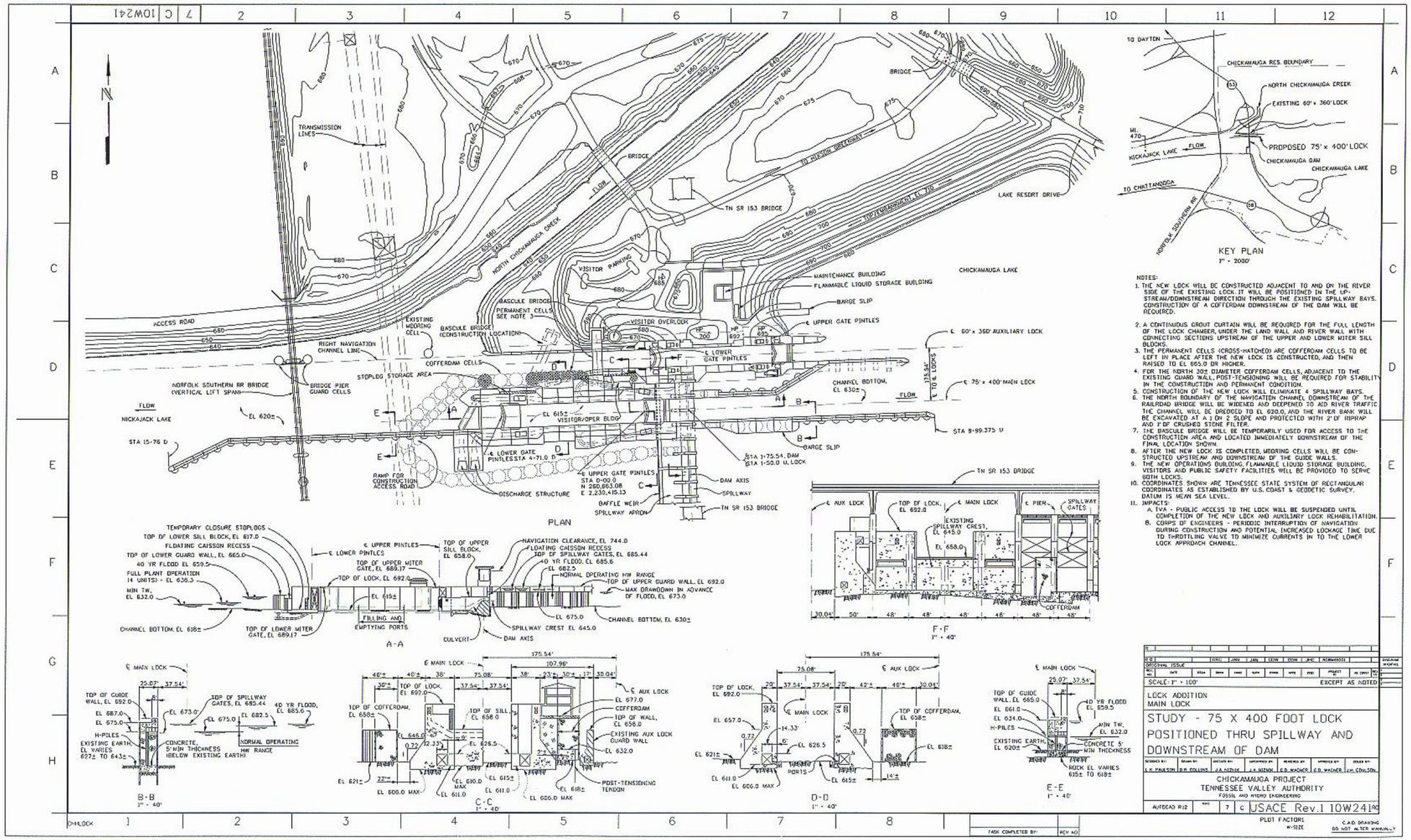

PLAN
A-A
B-B
C-C
D-D
E-E
F-F
KEY PLAN
1" = 2000'
NOTES:
1. THE NEW LOCK WILL BE CONSTRUCTED ADJACENT TO AND ON THE RIVER SIDE OF THE EXISTING LOCK. IT WILL BE POSITIONED IN THE UP-STREAM/DOWNSTREAM DIRECTION THROUGH THE EXISTING SPILLWAY BAYS. CONSTRUCTION OF A COFFERDAM DOWNSTREAM OF THE DAM WILL BE REQUIRED.
2. A CONTINUOUS GROUT CURTAIN WILL BE REQUIRED FOR THE FULL LENGTH OF THE LOCK CHAMBER, UNDER THE LAND WALL AND RIVER WALL WITH CONNECTING SECTIONS UPSTREAM OF THE UPPER AND LOWER MITER SILL BLOCKS.
3. THE PERMANENT CELLS (CROSS-HATCHED) ARE COFFERDAM CELLS TO BE LEFT IN PLACE AFTER THE NEW LOCK IS CONSTRUCTED, AND THEN RAISED TO EL 665.0 OR HIGHER.
4. FOR THE NORTH 30± DIAMETER COFFERDAM CELLS, ADJACENT TO THE EXISTING GUARD WALL, POST-TENSIONING WILL BE REQUIRED FOR STABILITY IN THE CONSTRUCTION AND PERMANENT CONDITION.
5. CONSTRUCTION OF THE NEW LOCK WILL ELIMINATE 4 SPILLWAY BAYS.
6. THE NORTH BOUNDARY OF THE NAVIGATION CHANNEL DOWNSTREAM OF THE RAILROAD BRIDGE WILL BE WIDENED AND DEEPENED TO AID RIVER TRAFFIC. THE CHANNEL WILL BE DREDGED TO EL 620.0, AND THE RIVER BANK WILL BE EXCAVATED AT A 1 ON 2 SLOPE AND PROTECTED WITH 2' OF RIPRAP AND 1' OF CRUSHED STONE FILTER.
7. THE BASCULE BRIDGE WILL BE TEMPORARILY USED FOR ACCESS TO THE CONSTRUCTION AREA AND LOCATED IMMEDIATELY DOWNSTREAM OF THE FINAL LOCATION SHOWN.
8. AFTER THE NEW LOCK IS COMPLETED, MOORING CELLS WILL BE CONSTRUCTED UPSTREAM AND DOWNSTREAM OF THE GUIDE WALLS.
9. THE NEW OPERATIONS BUILDING, FLAMMABLE LIQUID STORAGE BUILDING, VISITORS AND PUBLIC SAFETY FACILITIES WILL BE PROVIDED TO SERVE BOTH LOCKS.
10. COORDINATES SHOWN ARE TENNESSEE STATE SYSTEM OF RECTANGULAR COORDINATES AS ESTABLISHED BY U.S. COAST & GEODETIC SURVEY. DATUM IS MEAN SEA LEVEL.
11. IMPACTS:
A. TVA - PUBLIC ACCESS TO THE LOCK WILL BE SUSPENDED UNTIL COMPLETION OF THE NEW LOCK AND AUXILIARY LOCK REHABILITATION.
B. CORPS OF ENGINEERS - PERIODIC INTERRUPTION OF NAVIGATION DURING CONSTRUCTION AND POTENTIAL INCREASED LOCKAGE TIME DUE TO THROTTLING VALVE TO MINIMIZE CURRENTS IN TO THE LOWER LOCK APPROACH CHANNEL.
LOCK ADDITION
MAIN LOCK
STUDY - 75 X 400 FOOT LOCK POSITIONED THRU SPILLWAY AND DOWNSTREAM OF DAM
CHICKAMAUGA PROJECT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING
SCALE: 1" = 100'
EXCEPT AS NOTED
USACE Rev.1 10W241

FIGURE IX-2

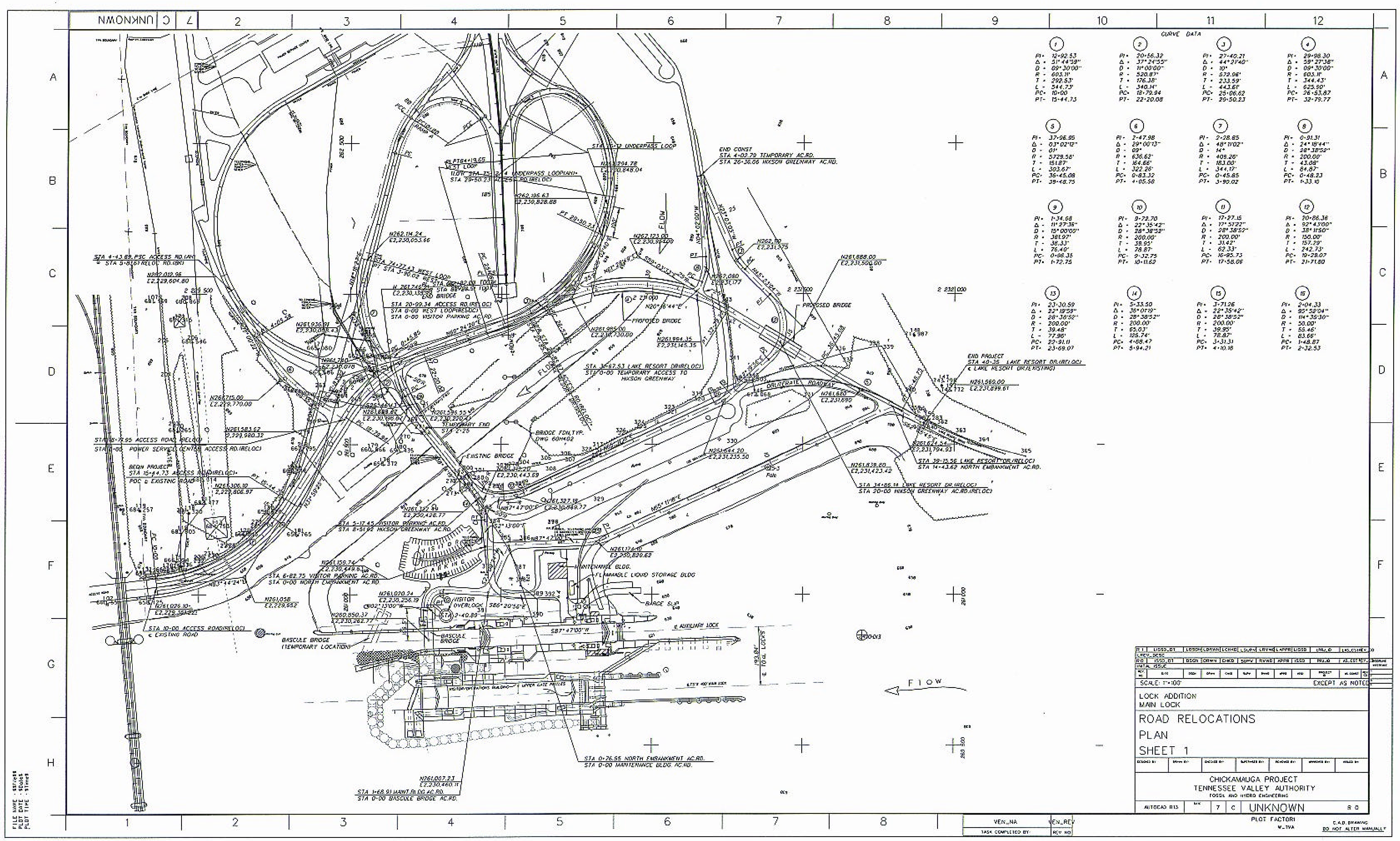
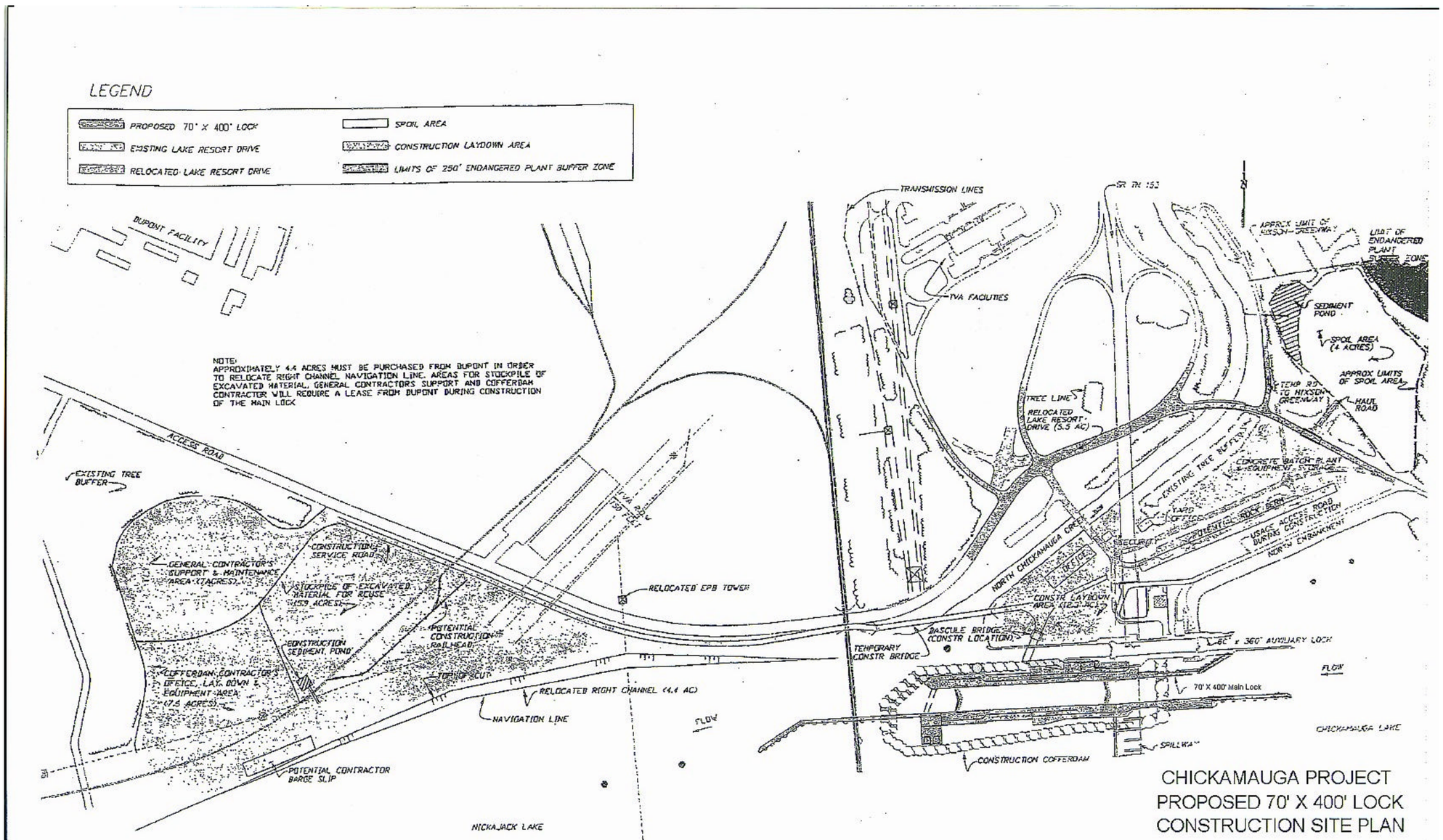

CURVE DATA
1 PI= 12+92.53 Δ= 51°44'59" D= 09°30'00" R= 603.11' T= 292.53' L= 544.73' PC= 10+00 PT= 15+44.73
2 PI= 20+56.32 Δ= 37°24'55" D= 11°00'00" R= 520.87' T= 176.38' L= 340.14' PC= 18+79.94 PT= 22+20.08
3 PI= 27+40.21 Δ= 44°21'40" D= 10° R= 572.96' T= 233.59' L= 443.61' PC= 25+06.62 PT= 29+50.23
4 PI= 29+98.30 Δ= 59°27'38" D= 09°30'00" R= 603.11' T= 344.43' L= 625.50' PC= 26+53.87 PT= 32+79.77
5 PI= 37+96.95 Δ= 03°02'12" D= 01° R= 5729.58' T= 151.87' L= 303.67' PC= 36+45.08 PT= 39+48.75
6 PI= 2+47.98 Δ= 29°00'13" D= 09° R= 636.62' T= 164.66' L= 322.28' PC= 0+83.32 PT= 4+05.58
7 PI= 2+28.85 Δ= 48°11'02" D= 14° R= 409.26' T= 183.00' L= 344.17' PC= 0+45.85 PT= 3+90.02
8 PI= 0+91.31 Δ= 24°18'44" D= 28°38'52" R= 200.00' T= 43.08' L= 84.87' PC= 0+48.23 PT= 1+33.10
9 PI= 1+34.68 Δ= 11°27'36" D= 15°00'00" R= 381.97' T= 38.33' L= 76.40' PC= 0+96.35 PT= 1+72.75
10 PI= 9+72.70 Δ= 22°35'42" D= 28°38'52" R= 200.00' T= 39.95' L= 78.87' PC= 9+32.75 PT= 10+11.62
11 PI= 17+27.15 Δ= 17°51'22" D= 28°38'52" R= 200.00' T= 31.42' L= 62.33' PC= 16+95.73 PT= 17+58.06
12 PI= 20+86.36 Δ= 92°43'00" D= 38°11'50" R= 150.00' T= 157.29' L= 242.73' PC= 19+29.07 PT= 21+71.80
13 PI= 23+30.59 Δ= 22°19'59" D= 28°38'52" R= 200.00' T= 39.48' L= 77.96' PC= 22+91.11 PT= 23+69.07
14 PI= 5+33.50 Δ= 36°01'19" D= 28°38'52" R= 200.00' T= 65.03' L= 125.74' PC= 4+68.47 PT= 5+94.21
15 PI= 3+71.26 Δ= 22°35'42" D= 28°38'52" R= 200.00' T= 39.95' L= 78.87' PC= 3+31.31 PT= 4+10.18
16 PI= 2+04.33 Δ= 95°58'04" D= 114°35'30" R= 50.00' T= 55.46' L= 83.66' PC= 1+48.87 PT= 2+32.53
STA 25+12 UNDERPASS LOOP
END CONST
STA 4+02.79 TEMPORARY AC.RD.
STA 26+36.06 HIXSON GREENWAY AC.RD.
STA 4+43.89 PSC ACCESS RD.(AH)
STA 5+82.61 RELOC RD.(BK)
STA 20+99.34 ACCESS RD.(RELOC)
STA 0+00 WEST LOOP(RELOC)
STA 0+00 VISITOR PARKING AC.RD.
PROPOSED BRIDGE
END BRIDGE
FLOW
STA 37+67.53 LAKE RESORT DR.(RELOC)
STA 0+00 TEMPORARY ACCESS TO HIXSON GREENWAY
OBLITERATE ROADWAY
END PROJECT
STA 40+35 LAKE RESORT DR.(RELOC)
℄ LAKE RESORT DR.(EXISTING)
BRIDGE FDN,TYP. DWG 60H402
EXISTING BRIDGE
TEMPORARY END STA 2+25
BEGIN PROJECT
STA 15+44.73 ACCESS ROAD(RELOC)
POC ℄ EXISTING ROAD
STA 39+15.56 LAKE RESORT DR.(RELOC)
STA 14+43.62 NORTH EMBANKMENT AC.RD.
STA 34+86.14 LAKE RESORT DR.(RELOC)
STA 20+00 HIXSON GREENWAY AC.RD.(RELOC)
STA 5+17.45 VISITOR PARKING AC.RD.
STA 8+51.92 HIXSON GREENWAY AC.RD.
STA 6+82.75 VISITOR PARKING AC.RD.
STA 0+00 NORTH EMBANKMENT AC.RD.
VISITOR PARKING
MAINTENANCE BLDG.
FLAMMABLE LIQUID STORAGE BLDG
BARGE SLIP
VISITOR OVERLOOK
BASCULE BRIDGE
BASCULE BRIDGE (TEMPORARY LOCATION)
STA 10+00 ACCESS ROAD(RELOC)
℄ EXISTING ROAD
℄ AUXILIARY LOCK
℄ TO ℄ LOCKS
STA 0+76.55 NORTH EMBANKMENT AC.RD.
STA 0+00 MAINTENANCE BLDG. AC.RD.
STA 1+68.91 MAINT.BLDG AC.RD.
STA 0+00 BASCULE BRIDGE AC.RD.
SCALE: 1"=100' EXCEPT AS NOTED
LOCK ADDITION
MAIN LOCK
ROAD RELOCATIONS
PLAN
SHEET 1
CHICKAMAUGA PROJECT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING
AUTOCAD R13
UNKNOWN
PLOT FACTOR
C.A.D. DRAWING
DO NOT ALTER MANUALLY

FIGURE IX-3

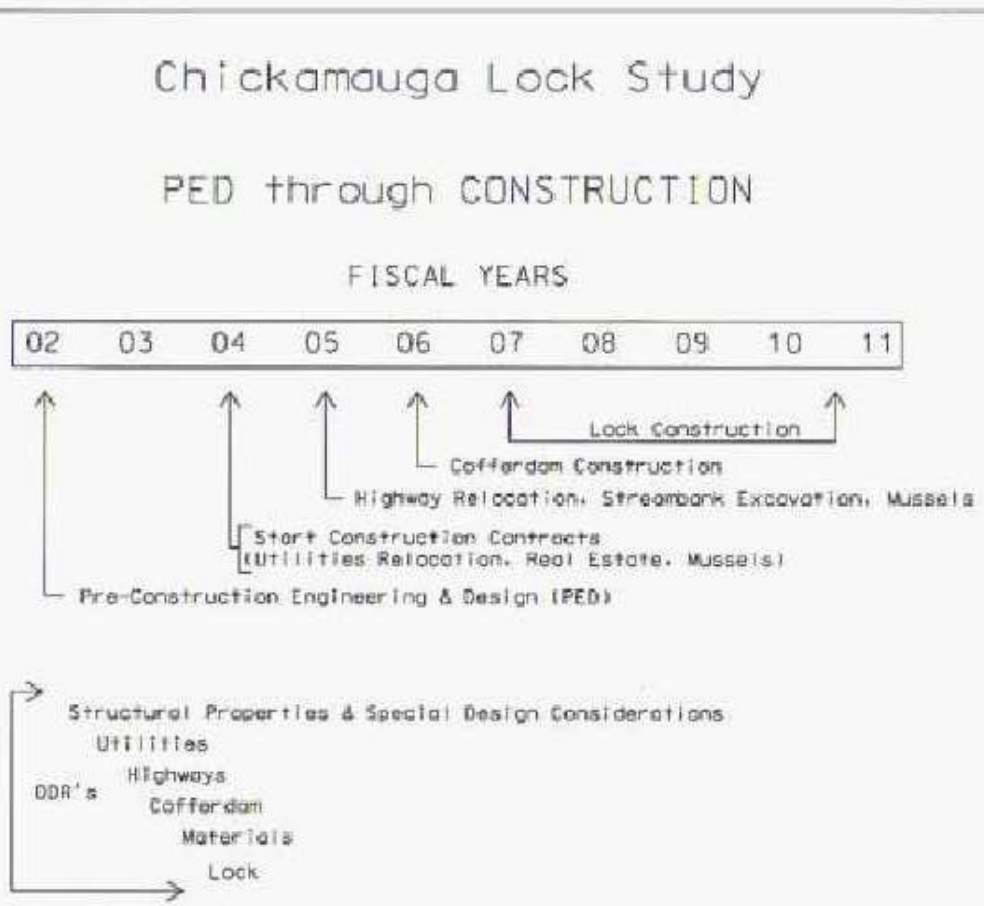


CHICKAMAUGA PROJECT
PROPOSED 70' X 400' LOCK
CONSTRUCTION SITE PLAN

FIGURE IX-4

Chickamauga Lock Study

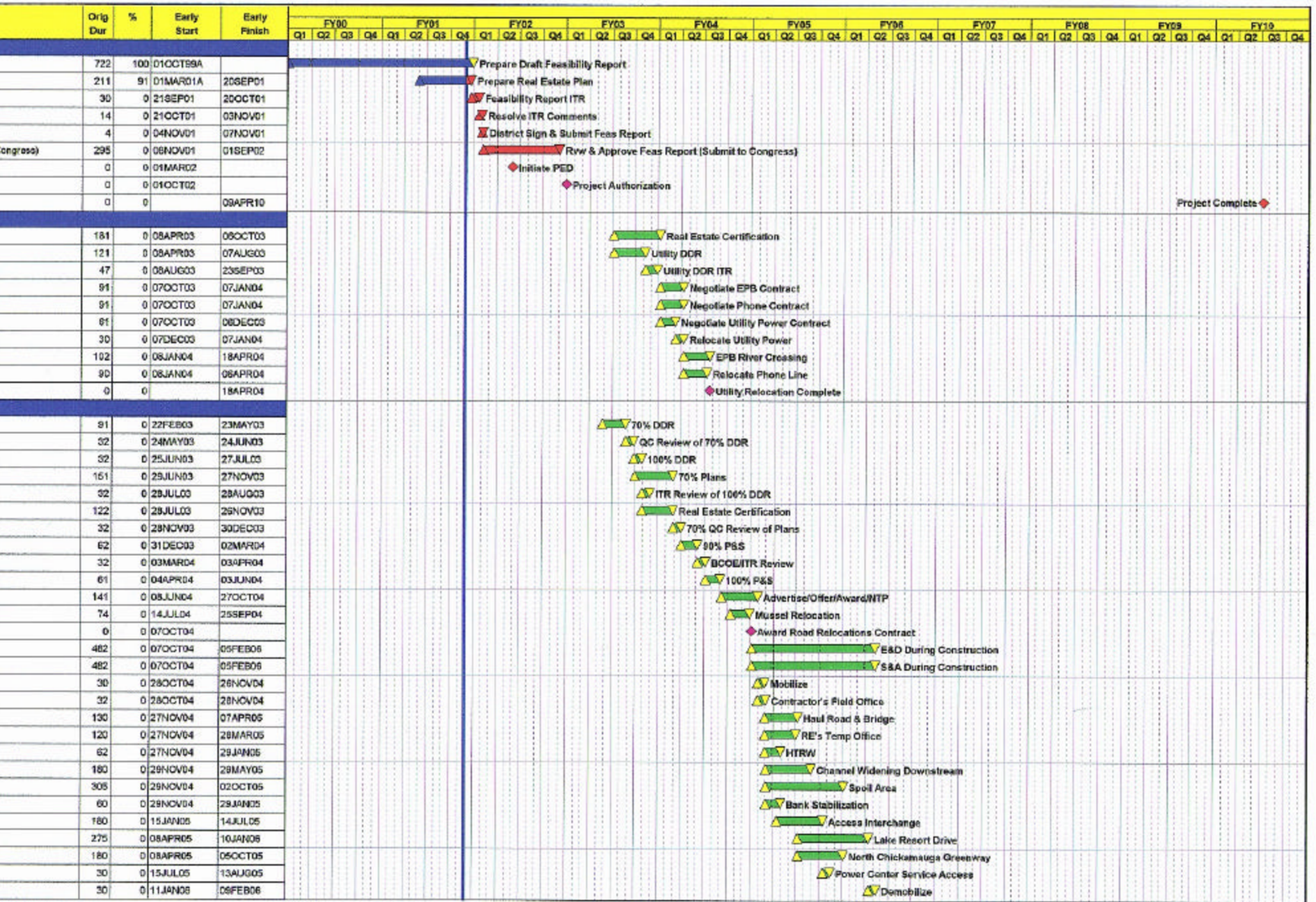
PED through CONSTRUCTION



Notes: Construction Start and Major Contracts only.
Schedule Assumes Optimum Funding.

FIGURE IX-5

	Activity Description	Orig Dur	%	Early Start	Early Finish
Owner					
	Prepare Draft Feasibility Report	722	100	01OCT99A	
	Prepare Real Estate Plan	211	91	01MAR01A	20SEP01
	Feasibility Report ITR	30	0	21SEP01	20OCT01
	Resolve ITR Comments	14	0	21OCT01	03NOV01
	District Sign & Submit Feas Report	4	0	04NOV01	07NOV01
	Rvw & Approve Feas Report (Submit to Congress)	295	0	08NOV01	01SEP02
	Initiate PED	0	0	01MAR02	
	Project Authorization	0	0	01OCT02	
	Project Complete	0	0		09APR10
Utility Relocations					
	Real Estate Certification	181	0	08APR03	06OCT03
	Utility DDR	121	0	08APR03	07AUG03
	Utility DDR ITR	47	0	08AUG03	23SEP03
	Negotiate EPB Contract	91	0	07OCT03	07JAN04
	Negotiate Phone Contract	91	0	07OCT03	07JAN04
	Negotiate Utility Power Contract	61	0	07OCT03	08DEC03
	Relocate Utility Power	30	0	07DEC03	07JAN04
	EPB River Crossing	102	0	08JAN04	18APR04
	Relocate Phone Line	90	0	08JAN04	08APR04
	Utility Relocation Complete	0	0		18APR04
Road Relocations: Downstream Excavation					
	70% DDR	91	0	22FEB03	23MAY03
	QC Review of 70% DDR	32	0	24MAY03	24JUN03
	100% DDR	32	0	25JUN03	27JUL03
	70% Plans	151	0	29JUN03	27NOV03
	ITR Review of 100% DDR	32	0	28JUL03	28AUG03
	Real Estate Certification	122	0	28JUL03	29NOV03
	70% QC Review of Plans	32	0	28NOV03	30DEC03
	90% P&S	62	0	31DEC03	02MAR04
	BCOE/ITR Review	32	0	03MAR04	03APR04
	100% P&S	61	0	04APR04	03JUN04
	Advertise/Offer/Award/NTP	141	0	08JUN04	27OCT04
	Mussel Relocation	74	0	14JUL04	25SEP04
	Award Road Relocations Contract	0	0	07OCT04	
	E&D During Construction	482	0	07OCT04	09FEB06
	S&A During Construction	482	0	07OCT04	09FEB06
	Mobilize	30	0	28OCT04	26NOV04
	Contractor's Field Office	32	0	28OCT04	28NOV04
	Haul Road & Bridge	130	0	27NOV04	07APR05
	RE's Temp Office	120	0	27NOV04	28MAR05
	HTRW	62	0	27NOV04	28JAN05
	Channel Widening Downstream	180	0	29NOV04	29MAY05
	Spoil Area	305	0	29NOV04	02OCT05
	Bank Stabilization	60	0	29NOV04	28JAN05
	Access Interchange	180	0	15JAN05	14JUL05
	Lake Resort Drive	275	0	08APR05	10JAN06
	North Chickamauga Greenway	180	0	08APR05	05OCT05
	Power Center Service Access	30	0	15JUL05	13AUG05
	Demobilize	30	0	11JAN06	09FEB06



Start Date 01OCT99
Finish Date 09APR10
Data Date 01SEP01
Run Date 03DEC01 11:02

Early Bar
Progress Bar
Critical Activity

© Primavera Systems, Inc.

CHVB

Chickamauga Additional Lock Feasibility Study

75' x 400'

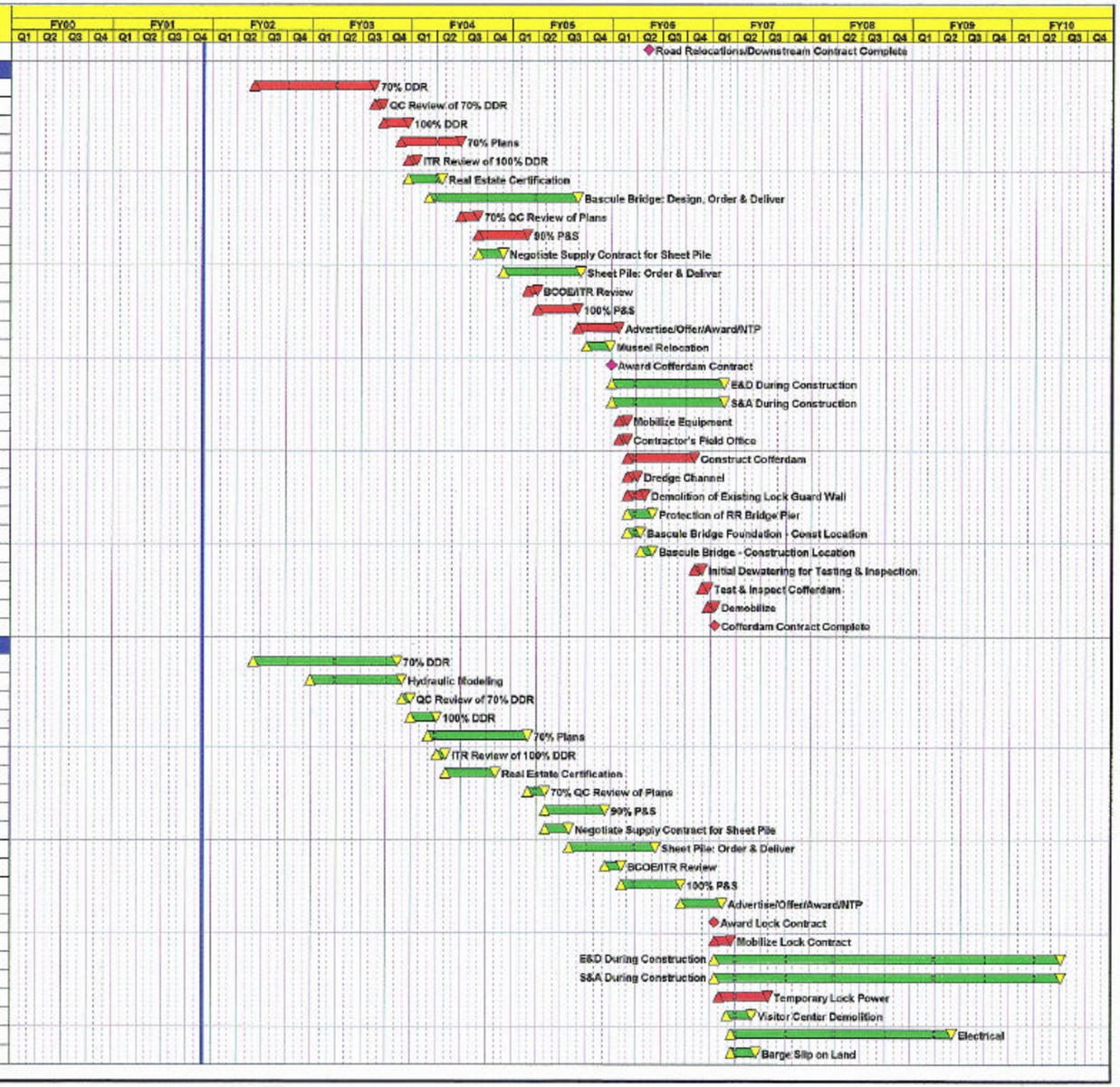
US ARMY CORPS OF ENGINEERS
Nashville District

Sheet 1 of 4

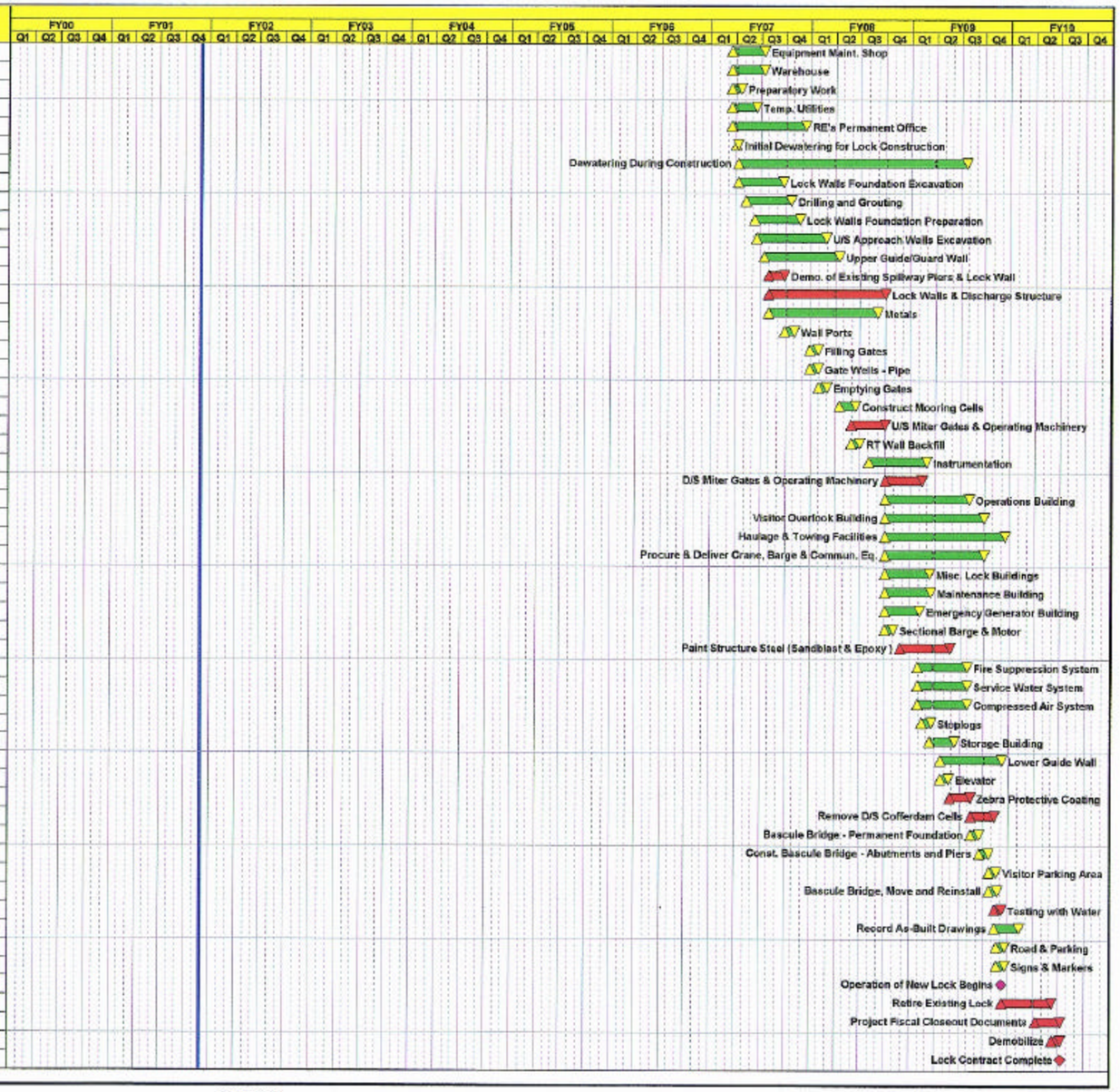
Date	Revision	Checked	Approved

FIGURE IX-6

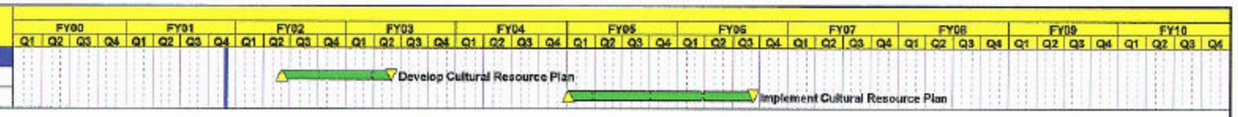
	Activity Description	Orig Dur	%	Early Start	Early Finish
	Road Relocations/Downstream Contract Complete	0	0		09FEB06
Cofferdam Construction					
	70% DDR	440	0	01MAR02	17MAY03
	QC Review of 70% DDR	32	0	18MAY03	18JUN03
	100% DDR	91	0	19JUN03	18SEP03
	70% Plans	217	0	22AUG03	27MAR04
	ITR Review of 100% DDR	32	0	19SEP03	20OCT03
	Real Estate Certification	122	0	19SEP03	20JAN04
	Bascule Bridge: Design, Order & Deliver	540	0	03DEC03	30MAY05
	70% QC Review of Plans	63	0	28MAR04	29MAY04
	90% P&S	181	0	30MAY04	27NOV04
	Negotiate Supply Contract for Sheet Pile	91	0	30MAY04	29AUG04
	Sheet Pile: Order & Deliver	281	0	30AUG04	08JUN05
	BCOE/ITR Review	32	0	29NOV04	30DEC04
	100% P&S	160	0	31DEC04	30MAY05
	Advertise/Offer/Award/NTP	151	0	31MAY05	29OCT05
	Mussel Relocation	88	0	30JUN05	26SEP05
	Award Cofferdam Contract	0	0	29SEP05	
	E&D During Construction	409	0	29SEP05	14NOV08
	S&A During Construction	409	0	29SEP05	14NOV08
	Mobilize Equipment	32	0	30OCT05	30NOV05
	Contractor's Field Office	32	0	30OCT05	30NOV05
	Construct Cofferdam	241	0	01DEC05	01AUG06
	Dredge Channel	33	0	01DEC05	04JAN06
	Demolition of Existing Lock Guard Wall	60	0	01DEC05	31JAN06
	Protection of RR Bridge Pier	90	0	01DEC05	02MAR06
	Bascule Bridge Foundation - Const Location	45	0	01DEC05	16JAN06
	Bascule Bridge - Construction Location	45	0	17JAN06	02MAR06
	Initial Dewatering for Testing & Inspection	26	0	02AUG06	29AUG06
	Test & Inspect Cofferdam	19	0	30AUG06	17SEP06
	Demobilize	26	0	18SEP06	15OCT06
	Cofferdam Contract Complete	0	0		15OCT06
Lock, Perm, Equip, Supply, & Cofferdam Removal					
	70% DDR	524	0	01MAR02	10AUG03
	Hydraulic Modeling	332	0	28SEP02	28AUG03
	QC Review of 70% DDR	32	0	29AUG03	29SEP03
	100% DDR	93	0	30SEP03	02JAN04
	70% Plans	359	0	04DEC03	28NOV04
	ITR Review of 100% DDR	32	0	03JAN04	03FEB04
	Real Estate Certification	182	0	04FEB04	04AUG04
	70% QC Review of Plans	62	0	29NOV04	31JAN05
	90% P&S	219	0	01FEB05	08SEP05
	Negotiate Supply Contract for Sheet Pile	91	0	01FEB05	02MAY05
	Sheet Pile: Order & Deliver	310	0	03MAY05	11MAR06
	BCOE/ITR Review	63	0	09SEP05	10NOV05
	100% P&S	213	0	11NOV05	13JUN06
	Advertise/Offer/Award/NTP	151	0	14JUN06	12NOV06
	Award Lock Contract	0	0	16OCT06	
	Mobilize Lock Contract	59	0	16OCT06	13DEC06
	E&D During Construction	1,255	0	16OCT06	09APR10
	S&A During Construction	1,255	0	16OCT06	09APR10
	Temporary Lock Power	160	0	30OCT06	29APR07
	Visitor Center Demolition	90	0	29NOV06	28FEB07
	Electrical	800	0	14DEC06	26FEB09
	Barge Slip on Land	90	0	14DEC06	16MAR07



	Activity Description	Orig Dur	%	Early Start	Early Finish
	Equipment Maint. Shop	120	0	14DEC06	14APR07
	Warehouse	120	0	14DEC06	14APR07
	Preparatory Work	33	0	14DEC06	17JAN07
	Temp. Utilities	90	0	14DEC06	15MAR07
	RE's Permanent Office	270	0	14DEC06	12SEP07
	Initial Dewatering for Lock Construction	7	0	29DEC06	05JAN07
	Dewatering During Construction	833	0	06JAN07	23APR09
	Lock Walls Foundation Excavation	169	0	06JAN07	23JUN07
	Drilling and Grouting	167	0	05FEB07	22JUL07
	Lock Walls Foundation Preparation	168	0	07MAR07	22AUG07
	U/S Approach Walls Excavation	257	0	16MAR07	28NOV07
	Upper Guide/Guard Wall	270	0	15APR07	12JAN08
	Demo. of Existing Spillway Piers & Lock Wall	60	0	30APR07	23JUN07
	Lock Walls & Discharge Structure	424	0	30APR07	29JUN08
	Metals	396	0	30APR07	01JUN08
	Wall Ports	33	0	29JUN07	01AUG07
	Filling Gates	33	0	28SEP07	30OCT07
	Gate Wells - Pipe	33	0	28SEP07	30OCT07
	Emptying Gates	33	0	31OCT07	02DEC07
	Construct Mooring Cells	62	0	13JAN08	14MAR08
	U/S Miter Gates & Operating Machinery	124	0	27FEB08	29JUN08
	RT Wall Backfill	33	0	27FEB08	30MAR08
	Instrumentation	213	0	01MAY08	30NOV08
	D/S Miter Gates & Operating Machinery	137	0	30JUN08	14NOV08
	Operations Building	305	0	30JUN08	03MAY09
	Visitor Overlook Building	360	0	30JUN08	27JUN09
	Haulage & Towing Facilities	437	0	30JUN08	13SEP09
	Procure & Deliver Crane, Barge & Commun. Eq.	360	0	30JUN08	27JUN09
	Misc. Lock Buildings	163	0	30JUN08	10DEC08
	Maintenance Building	166	0	30JUN08	15DEC08
	Emergency Generator Building	126	0	30JUN08	05NOV08
	Sectional Barge & Motor	32	0	30JUN08	01AUG08
	Paint Structure Steel (Sandblast & Epoxy)	181	0	27AUG08	25FEB09
	Fire Suppression System	180	0	29OCT08	28APR09
	Service Water System	180	0	29OCT08	28APR09
	Compressed Air System	180	0	29OCT08	28APR09
	Stoplogs	33	0	15NOV08	17DEC08
	Storage Building	91	0	11DEC08	13MAR09
	Lower Guide Wall	230	0	19JAN09	06SEP09
	Elevator	33	0	19JAN09	20FEB09
	Zebra Protective Coating	75	0	26FEB09	11MAY09
	Remove D/S Cofferdam Cells	86	0	12MAY09	06AUG09
	Bascule Bridge - Permanent Foundation	33	0	12MAY09	13JUN09
	Const. Bascule Bridge - Abutments and Piers	33	0	14JUN09	17JUL09
	Visitor Parking Area	30	0	18JUL09	16AUG09
	Bascule Bridge, Move and Reinstall	33	0	18JUL09	19AUG09
	Testing with Water	30	0	07AUG09	05SEP09
	Record As-Built Drawings	91	0	08AUG09	06NOV09
	Road & Parking	33	0	17AUG09	18SEP09
	Signs & Markers	33	0	17AUG09	18SEP09
	Operation of New Lock Begins	0	0		05SEP09
	Retire Existing Lock	183	0	06SEP09	09MAR10
	Project Fiscal Closeout Documents	91	0	05JAN10	09APR10
	Demobilize	30	0	10MAR10	08APR10
	Lock Contract Complete	0	0		08APR10



	Activity Description	Orig Dur	%	Early Start	Early Finish
Cultural Resources					
	Develop Cultural Resource Plan	363	0	01MAR02	01MAR03
	Implement Cultural Resource Plan	607	0	07OCT04	10JUN06



Sheet 4 of 4