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MAINTENANCE MANUAL
BRAINERD AREA FLOOD RELIEF PLAN ALONG
SOUTH CHICKAMAUGA CREEK
CHATTANOOGA, TENNESSEE.

TENNESSEE VALLEY AUTHORITY

KNOXVILLE, TENNESSEE

PURPOSE OF MANUAL

This manual is a guide for maintaining the project which consists of a detention basin, earth levee, enlarged and relocated creek channel, three pumping stations, and appurtenant structures. The limits of the project are shown on exhibit 1. The city of Chattanooga will follow the procedures set forth herein to assure full realization of the flood protection benefits which the project was designed to provide. Inadequate maintenance will result in serious impairment of the effectiveness of the project.

MAINTENANCE - GENERAL REQUIREMENTS

The general requirements for the city's maintenance of the project are:

1. The detention basin, earth levee, enlarged and relocated creek channel and rights-of-way shall be maintained so that they substantially conform to the cross section and other design requirements shown on the construction plans and so that the planned floodway capacity is not restricted.
2. The three pumping stations and appurtenant structures shall be maintained so that they are operational at all times.
3. Encroachments and trespasses upon the detention basin, earth levee, and enlarged and relocated creek channel rights-of-way which will adversely affect the efficient operation or maintenance of the project shall not be permitted.
4. Adequate and systematic inspections shall be carried out to determine maintenance needs and adequacy of corrective measures and to forestall potential encroachments.
5. An official, hereinafter called "Superintendent," appointed by the City Council, shall develop and implement detailed plans for proper maintenance of the detention basin, earth levee, enlarged and relocated creek channel, pumping stations, and appurtenant structures.

MAINTENANCE

1. To minimize erosion, it is necessary that a growth of vegetation conforming to TVA drawings and specifications be maintained on the earth slopes and within the rights-of-way of the detention basin, earth levee, and enlarged

and relocated creek channel. Appropriate fertilization, replanting, and mowing shall be done in conformance with TVA drawings and specifications.

2. The detention basin and enlarged and relocated creek channel shall be kept reasonably clear of drifts, boulders, shoals, and other obstructions except for those specifically placed as fish attractors. The obstructions shall be removed before each flood season and as soon as practical after each flood.

3. Eroded places which may develop in the slopes or berms of the earth levee and enlarged and relocated creek channel shall be repaired, using specifications shown on TVA drawings.

4. Riprap or other slope revetment shall be maintained in a stable condition and replaced if necessary using specifications shown on TVA drawings.

5. ~~Damage to concrete structures shall be repaired using specifications shown on TVA drawings.~~

6. Electrical and mechanical components of the pumping stations and appurtenant structures shall be maintained so that they are operational at all times. Maintenance shall be carried out according to manufacturers publications and specifications and TVA drawings.

7. Repairs shall be made as soon as practicable after damage occurs.

8. TVA, when called upon, will furnish the city, without charge, technical advice regarding maintenance and whether proposed encroachments are objectionable. When such advice is desired, the city should contact the Director of Water Resources, Tennessee Valley Authority, Knoxville, Tennessee 37902.

APPOINTMENT OF SUPERINTENDENT

An official, hereinafter called "Superintendent," appointed by the City Council, shall develop and implement detailed plans for proper inspection and maintenance of the project features.

DUTIES OF SUPERINTENDENT

1. Inspections

a. He shall inspect the detention basin, earth levee, enlarged and relocated creek channel, the three pumping stations, and appurtenant structures. Inspections shall be made at the intervals shown on the inspection frequency table, appendix A. TVA will provide initial direction including participation in checklist inspections.

b. He shall use inspection checklists similar in form to appendix B when making his inspections. All blank spaces on such forms shall be filled in by indicating that the condition of the item is satisfactory or unsatisfactory and noting the nature of the maintenance required for that item.

2. Maintenance--He shall use qualified city employees and city equipment and other qualified personnel and equipment provided by the city for inspection and maintenance of the project. He shall advise the City Council of his requirements for men and/or equipment and shall recommend means of filling those needs in excess of the capabilities of city employees and city equipment.

3. Reports--He shall submit annual reports to TVA, through the City Council. These reports, which shall be submitted by November 1, shall be similar in form to appendix C and shall include as attachments, dated copies of all inspection checklists made during the period covered by the report.

4. Encroachments--In inspecting the project, he shall look for any construction, trash or waste disposal, or other activity which encroaches upon the right-of-way. He shall report any such encroachments to the City Council, and shall request the council to instruct the City Attorney to effect removal of any unauthorized encroachment or cessation of the activity causing the encroachment.

USE OF RIGHTS-OF-WAY

1. Use of rights-of-way for crossings by gaslines, petroleum lines, waterlines, sewerlines, streets, railroads, etc., may be permitted provided the proposed encroachment does not restrict the floodway capacity or interfere with maintenance of the detention basin and enlarged and relocated creek channel. Also, the crossings shall not endanger the structural integrity of nor interfere with the operation or maintenance of the earth levee, pumping stations, and appurtenant structures. However, only those structures or improvements or excavations shall be permitted within, over, under, or across the detention basin, earth levee, enlarged and relocated creek channel, pumping stations, and appurtenant structures that are permitted

and approved under the flood plain regulations sections of the City of Chattanooga Zoning Ordinance, Subdivision Regulations, and Building Code adopted as part of this flood damage prevention project. Advice regarding the effect of proposed improvements or alterations on the functioning of the project and information concerning methods of construction acceptable under standard engineering practice will be available, upon request, from TVA, Director of Water Resources. TVA will review and approve the plans for all proposed encroachments upon the project right-of-way including the plans for abandoning existing encroachments through the Director of Water Resources.

2. In any case where a construction permit is requested for a purpose where erection, use, or removal might cause disfigurement or damage to the flood protection rights-of-way, the city shall require the applicant to post a bond of sufficient amount to protect the city from any cost of repair or removal, and to guarantee faithful performance of the permit conditions. In such cases the permit should state the amount and conditions of the bond.

TVA INSPECTIONS

TVA will make detailed inspections of the project at such times it deems necessary or desirable. All inspections will be made jointly with representatives of the city of Chattanooga. Maintenance measures or repairs which TVA considers necessary shall be performed by the city as soon as practicable upon receipt of notice from TVA that such repair or maintenance work is required.

MAPS AND DRAWINGS

TVA will furnish the city with a reproducible and three full-size prints of each of its drawings of the project. Also, TVA will furnish the city with three copies of all manufacturer's instructions and pamphlets.

A list of all drawings, instructions, and pamphlets appear in appendix D. The drawings, instructions, and pamphlets are furnished separately owing to their number and size but are to be considered an integral part of this manual.

All elevations shown on the construction drawings for the project refer to elevations in feet above mean sea level (USC and GS, 1936 Supplemental Adjustment).

Adopted _____ (Date)

CITY OF CHATTANOOGA, TENNESSEE

Mayor (Signature)

TENNESSEE VALLEY AUTHORITY

General Manager (Signature)

SOUTH CHICKAMAUGA CREEK PROJECT
MAINTENANCE/INSPECTION CHECKLIST

PUMPS AND MOTORS

GENERAL

The installation, operation, and maintenance instructions for the pumps and motors are included in the manufacturer's literature and should be closely followed during maintenance/inspection checks. The manufacturer's bulletins for the pumps and motors are as follows:

Pumps: M-50 - Installation and Operation Instructions - Low Lift-
Type Propeller and Mixed Flow Pumps - Aurora Pumps

Motors: GEH-3292C and GEH-3294D - Vertical Induction Motors Instructions -
General Electric

It is preferable to test the units under loaded conditions. However, it is difficult to entrap the water necessary for such operations unless more than normal rainfall has occurred.

Water may be collected at pumping station 1 (PS1) by closing the gravity sluice gates and containing the runoff from a heavy rain in the protect area. Sufficient water may also be collected by leaving the gravity sluice gates open during a flood on South Chickamauga Creek until the detention basin is flooded to elevation 654.0 and then closing the gravity sluice gates.

Water may be collected at pumping stations 2 and 3 (PS2 and PS3) by covering the discharge culverts with temporary bulkheads. The sluice gates should be open, and the temporary bulkheads must be easily removable in case of heavy rains during the test period. The water may be circulated during tests as long as the temporary bulkheads are in place. The water level required for testing is elevation 668.0.

Storage of water above elevation 654.0 at PS1 and elevation 668.0 at PS2 and PS3 will aid in the performance of the tests; however, should the water level rise to elevation 656.0 at PS1 or elevation 669.0 at PS2 and PS3, then testing should stop and the sluice gates be opened or the temporary bulkheads pulled.

Pump operation must be stopped at levels required for pump suction. These levels are elevation 651.0 for PS1 and elevation 665.5 for PS2 and PS3.

To check pump rotation below elevation 652.5 at PS1 and elevation 667.0 at PS2 and PS3; jumper wires must be placed across studs 13-14 on Rly 63-1E, 63-2E, 63-3E, 63-4E, and 63-5E at PS1; across 63-1E, 63-2E, and 63-3E at PS2; and across 63-1E and 63-2E at PS3.

Due to the difficulty in retaining water for loaded conditions the pumps may be checked in the "dry" when water is not available. It is not recommended that the pumps be run in the "dry" condition, but they may be bumped or started for a short period, less than 30 seconds, for the required testing.

**SOUTH CHICKAMAUGA CREEK PROJECT
MAINTENANCE/INSPECTION CHECKLIST**

Inspected by: _____
*Date: _____

Feature	Pump No. 1 ***	Condition		Remarks**
		Satisfactory	Unsatisfactory	
Pumping Station No. 1	2			
	3			
	4			
	5			
	6			
Pumping Station No. 2	7			
	8			
	9			
Pumping Station No. 3	10			

*Inspection frequency: Annually prior to the flood season. Use additional sheets, drawings, or photographs if necessary. City to designate each pump with a number as shown in table. Each pump to have its designated number painted on it.

***All pumps to be subjected to the following tests.

PRESTART CHECKS

1. Check pump lubricating oil reservoir level and verify that oil reservoir is full.
2. Check motor upper and lower bearing levels through sight glasses provided and fill if needed.
3. Check for and remove debris from sump and level switch well.
4. Check grease in suction case bearing.
5. Remove pipe plug at top of tubing connector and fill upper cavity with oil if needed.
6. Check oil flow from oil reservoir for free flow. The solenoid must be operated to observe flow at the lubricator adjust valve. Flow should be adjusted to approximately one drop per second for these pumps since use is so infrequent. For manufacturer's adjustments, see pump literature.

ROTATING CHECKS

The motor heater and electrical power supply to the motors must be energized. With the motor in manual control, momentarily start the motor (bump) to start rotation and check the following:

1. Check rotation. The rotation should be counter-clockwise looking down on the pump.
2. Check for any unusual noise or vibrations while unis coasting.

SOUTH CHICKAMAUGA CREEK PROJECT
MAINTENANCE/INSPECTION CHECKLIST

Inspected by: _____

*Date: _____

Feature	Pump No. ***	Condition		Remarks**
		Satisfactory	Unsatisfactory	
Pumping Station No. 1	Pump No. ***			
Pumping Station No. 2	Pump No. ***			
Pumping Station No. 3	Pump No. ***			

*Inspection frequency: Every 5 years pull one pump from each pumping station and inspect for the following:

**Note any change from previous inspections or conditions that need attention. Use additional sheets, drawings, or photographs if necessary.

***City to determine which pump to pull at each pumping station. If any adverse conditions are encountered on the pump that is pulled, then all pumps at that pumping station shall be pulled and inspected.

1. Check the impeller for damage.
2. Check bearings for unusual wear and replace if necessary.
3. Inspect shaft lip seal.
4. Check oil in motor reservoirs and replace if dirty.
5. Check bypass port on the enclosed shaft. The port must be open to provide adequate drainage.
6. Inspect flanged joints and shaft couplings for tightness.
7. Check suction case bearing Grease level.

SOUTH CHICKAMAUGA CREEK PROJECT
MAINTENANCE/INSPECTION CHECKLIST

Inspected by: _____
*Date: _____

Feature	Condition		Remarks**
	Satisfactory	Unsatisfactory	
Pumping Station No. 1 Level switch in gage well***			
Pumping Station No. 2 Level switch in gage well***			
Pumping Station No. 3 Level switch in gage well***			

*Inspection frequency: Annually prior to the flood season. Use additional sheets, drawings, or photographs if necessary. Use TVA drawings 107-19E200-2, 107-19E205-1, and 107-19E210-1.

***Level switches shall be checked for the following.

1. The physical location of the probe shall be verified to be at the level for desired operation.
2. A check for circuit operation shall be made to assure circuit continuity from level switch probe to relays.

Annual Maintenance Report
Brainerd Area Flood Relief Plan Along
South Chickamauga Creek
Chattanooga, Tennessee

Summary

- 1. Date of this report _____
- 2. Date of last report _____
- 3. Project feature _____
 - a. Unusual repairs or remarks concerning major maintenance _____

 - b. The following major repairs, revealed by the inspections, were made.
(Enclose rough plan of repairs made or explain.)

- 4. Date the above repairs were made _____
- 5. Remarks and explanations _____

SIGNED: _____
Superintendent

NOTE: Where additional space is required for any item listed above, use the reverse side of this sheet.

APPENDIX D

LIST OF TVA DRAWINGS

<u>DRAWING NO.</u>	<u>TITLE</u>
<u>CIVIL</u>	
81-C-101-19E200	General - Plans and Sections
81-C-101-19E205-1	Levee, Channel, and Detention Basin Station 7+54.72 to 45+00
81-C-101-19E205-2	" " " "
81-C-101-19E207-1	Levee, Channel, and Detention Basin Station 45+00 to 114+00
81-C-101-19E207-2	" " " "
81-C-101-19E209-1	Levee, Channel, and Detention Basin Station 114+00 to 157+00
81-C-101-19E209-2	" " " "
81-C-101-19E209-3	" " " "
81-C-101-19E211	Levee, Channel, and Detention Basin Station 157+00 to 180+83.73
81-C-101-19E212-1	Levee, Channel, and Detention Basin Station 300+00 to 305+78.94 Miscellaneous Structures - Outline
81-C-101-19E212-2	" " " "
81-C-101-19E213-1	Levee, Channel, and Detention Basin Station 300+00 to 305+78.94 Miscellaneous Structures - Reinforcement
81-C-101-19E213-2	" " " "
81-C-101-19E220	Levee, Channel, and Detention Basin Monitoring Station No. 1 and 2 Outline and Reinforcement
81-C-101-19E225-1	Pumping Station No. 1 - Outline
81-C-101-19E225-2	" " " "
81-C-101-19E225-3	" " " "
81-C-101-19E225-4	" " " "
81-C-101-19E226-1	Pumping Station No. 1 - Reinforcement
81-C-101-19E226-2	" " " "
81-C-101-19E226-3	" " " "
81-C-101-19E226-4	" " " "
81-C-101-19E226-5	" " " "

<u>DRAWING NO.</u>	<u>TITLE</u>
<u>CIVIL, Continued</u>	
81-C-101-19E230-1	Pumping Station No. 1 - Final Grading and Drainage Structures
81-C-101-19E230-2	" " " "
81-C-101-19E235-1	Pumping Station No. 2 - Outline and Reinforcement
81-C-101-19E235-2	" " " "
81-C-101-19E235-3	" " " "
81-C-101-19E235-4	" " " "
81-C-101-19E235-5	" " " "
81-C-101-19E240-1	Pumping Station No. 3 - Outline and Reinforcement
81-C-101-19E240-2	" " " "
81-C-101-19E240-3	" " " "
81-C-101-19E240-4	" " " "
81-C-101-19E245-1	Pumping Station No. 2 - Final Grading and Drainage Structures
81-C-101-19E245-2	" " " "
81-C-101-19E246	Pumping Station No. 3 - Final Grading
81-C-108-19E225	Pumping Station No. 1 - Trash Racks and Guides
81-C-108-19E226	Pumping Station No. 1 - Platform, Frames, and Grating
81-C-108-19E235	Pumping Station No. 2 - Trash Racks and Frames
81-C-108-19E236	Pumping Station No. 2 and 3 - Ladders, Grating, and Frames
81-C-108-19E240	Pumping Station No. 3 - Trash Racks and Frames
<u>MECHANICAL</u>	
81-H-104-19E200-1	Pumping Station No. 1 - 7' x 7' Slide Gate Arrangement
81-H-104-19E205-1	Pumping Station No. 1 - 4' x 4' Slide Gate Arrangement

DRAWING NO.TITLEMECHANICAL, Continued

81-H-104-19E225-1	Pumping Stations Nos. 2 and 3 3' x 3' Slide Gate Arrangement
81-H-104-19E265-1	Levee Installations 3' x 3' and 4' x 4' Slide Gate
81-H-104-19E265-2	" " " "
81-M-107-19E200-1	" " " "
81-M-107-19E200-2	Pumps and Piping Arrangement - Pumping Station 1
81-M-107-19E205-1	" " " " - Pumping
81-M-107-19E210-1	Station 2 " " " - Pumping Station 3

ELECTRICAL

81-E-105-19E500	Pumping Stations Nos. 1, 2, 3 - Wiring Diagrams
81-E-105-19E511-1	Pumping Station No. 1 - Wiring Diagrams
81-E-105-19E511-2	" " " "
81-E-105-19E512	Pumping Station No. 2 - Wiring Diagrams
81-E-105-19E513	Pumping Station No. 3 - Wiring Diagrams
81-E-105-19E520-1	Pumping Stations 1, 2, 3, and Sewage Treatment Plant - Wiring Diagrams
81-E-105-19E520-2	" " " "
81-E-105-19E800-1	" " " "
81-E-105-19E800-2	Pumping Station No. 1 - Conduit and Grounding and Lighting
81-E-105-19E806-1	" " " "
81-E-105-19E806-2	Pumping Station No. 2 - Conduit and Grounding and Lighting
81-E-105-19E812-1	" " " "
81-E-105-19E812-2	Pumping Station No. 3 - Conduit and Grounding and Lighting
81-E-105-19E814	" " " "
81-E-105-19C400	Conduit and Grounding - General Arrangement. Conduit and Cable Schedules

<u>DRAWING NO.</u>	<u>TITLE</u>
<u>ARCHITECTURAL</u>	
81-A-106-19E200-1	Pumping Station Nos. 1, 2, and 3 - Door and Frame Hardware and Details
81-A-106-19E200-2	Pumping Station Nos. 1, 2, and 3 - Roof and Louver Details
81-A-106-19E205	Pumping Station No. 2 and Levee at Brainerd Road - Chain Link Fence Details
81-A-106-19E206	Pumping Station No. 3 - Chain Link Fence Details

LAND AND FORESTRY RESOURCES

107-15-1	Recreation-Wildlife Planting Plan
107-15-2	" " " "

LIST OF MANUFACTURER'S DRAWINGS AND PAMPHLETSMECHANICAL

B-1119, B-1120, B-1121, B-1122, B-3600-1, B-3600-2, B-3602, C-7012, C-7013, C-2106-1, B-4527, A-4545, A-4599, A-4026, A-5602, A-5522-2, A-5522-3, A-5522-4, A-5603, B-3600-3, A-2001, B-5574, C-13829, C-12624-4, D-26175, E-17023, E-6400, F-9587, 68007-2, 05-408-0126-4, 15-477-6542-3, E-6565-E, E-16021, E-16026, Rodney Hunt Slide Gate Instruction Manual, Limitorque Operator Instruction Manual, Power Drill Actuator Catalog Data, Helland Torque-Tender Catalog Data, Westran Bevel Geared Actuator Catalog Data, Record Corporation Slide Gate and Operator Instruction Manual

In the following list, item 1 is the 50,000 gpm pumping units with induction motors for pumping station No. 1. Item 2 is the 12,000 gpm pumping units with induction motors for pumping stations Nos. 2 and 3.

<u>Drawing No.</u>	<u>Title</u>	<u>Subcontractor Name If Applicable</u>
476-72207-113	42P48 B.B. Discharge Pump Assembly	Aurora Pump
476-72207-111	Aurora 1160 Series Pumps	"
476-72207-112	Speed Torque Curve	"
476-72207-114	NPSH Curve	"
476-72208-113	20P24 with 45-Degree Discharge Elbow	"
476-72208-111	Aurora 1160 Series Pumps	"
476-72208-112	Speed Torque Curves	"
476-72208-114	NPSH Curve	"
320-2195-000	Lubricator Assembly with Solenoid Valve	"

<u>Drawing No.</u>	<u>Title</u>	<u>Subcontractor Name If Applicable</u>
476-72207-116	Parts List for 320-2195-000	"
476-72207-117	Two-Way NC Solenoid Valve (5 pages)	ALCO Controls
M-50	Installation and Operating IB	Aurora Pump
992C741AB	Outline Induction Motor - Item 1	General Electric
GEH-3292C	Instructions - Vertical Induction Motors - Open Enclosure - Item 1	"
NP 166711	Connection Nameplate - Item 1	"
456HA146	Time Current Heating Curves and ACC Time versus Current Curves - Item 1	"
456HA147	Speed Torque Current Curves - Item 1	"
992C742AB	Outline Induction Motor - Item 2	"
GEG-20219	Renewal Parts - Vertical TE Induction Motors - Item 2	"
GEH-3294D	Instructions - Vertical Induction Motors - Total Enclosed - Item 2	"
GEM-2034E	Figure 1 Connection Diagram - Item 2	"
456HA145	Speed Torque Current Curves - Item 2	"
456HA144	Time Current Heating Curves and ACC Time versus Current Curves - Item 2	"
<u>FOR PUMP S/N 476-72207, PROTOTYPE 42P</u>		
77-295	Cavitation Test Data Record	Aurora Pump
77-294	Lab Test Data Record	"
77-295	Performance Curves	"
<u>FOR PUMP S/N 476-72208</u>		
77-277	Lab Test Data Record	Aurora Pump
77-	Cavitation Test Data Record (Two sheets)	"
77-277	Performance Curve 476-72208A	"
<u>FOR PUMP S/N 476-72207 MODEL TEST</u>		
77-294	Lab Test Data Record	Aurora Pump
77-295	Cavitation Test Data Record	"
77-294	Performance Curve	"
RT MSJ 4512	Routine Test for Induction Motor S/N FNJ 622017, -18, 629019, and -20, Item 1	General Electric
RT MSJ 4513	Test for Induction Motor S/N FNJ 622016 (2 Pages), Item 1	"
GEG-20220	Renewal Parts - Vertical Induction Motors - NEMA WP 1, Item 1	"
MSJ 4438	Sound Level Test for Induction Motor S/N FNJ 601130, Item 2	"

ELECTRICAL

1. TVA contract 77K15-822428-1, Manual of Instructions, Series 2056, Voice Frequency, Carrier Equipment, RFL Industries, Incorporated.
2. TVA contract 77K15-822428-2, Instruction Manual, All Solid State Annunciator Model No. 1211A, Sequence-AFM Reflash, Serial No. S79489, Beta Products, Incorporated.
3. TVA contract 77K3-821901, Instruction Book, Motor Control Centers, Transformer, Bus Duct; South Chickamauga Creek Project, Westinghouse Electric Corporation.
4. The following RFL, Incorporated, drawings pertaining to TVA contract 77K15-822428-1:
 - HB-14525-B-1, Revision C, Chassis Assembly
 - CB-21423-1, Tone Transmitter Chassis Wiring Diagram, Model HB-14525
 - CB-21424-1, Tone Transmitter Chassis Wiring Diagram, Model HB-14525
 - CB-21425-1, Tone Receiver Chassis Wiring Diagram, Model HB-13517
5. The following Westinghouse Electric Corporation drawings pertaining to TVA contract 77K3-821901:
 - 273C853 Wall Mounted Type "RJ" Bushing Outline
 - 4604C91 Transformer Wiring Diagram
 - 5057A86 Type IVL Lighting Arrester Outline
 - 7230D40 SL Substation, Standard Outline Details
 - 9332D13 SL Substation Transformer, Outline and Dimensions
 - 48-061-44B, Bushing Terminal Connectors
 - 48-061-55, "ASA" Standard Condenser Bushing, Type 05, 400 Amperes
46-kV Insulation Class
6. The following Control Power Systems, Incorporated, drawings pertaining to TVA contract 77K3-821901:
 - R-41599, Pumping Station No. 1, Schematic Diagram
 - R-41600, Pumping Station No. 1, Schematic Diagram
 - R-41604, Pumping Station No. 2, Schematic Diagram
 - R-41605, Pumping Station No. 3, Schematic Diagram
 - R-41612, MCC No. 1, Elevations and Sill Plan
 - R-41613, MCC No. 2, and MCC No. 3, Elevations and Sill Plans

ELECTRICAL, Continued

R-41614, Bus and Duct Arrangement Elevations
R-41654, Pumping Station No. 1, Wiring Diagrams, Panels 1A and 2A
R-41655, Pumping Station No. 1, Wiring Diagrams, Panels 3A and 4A
R-41656, Pumping Station No. 1, Wiring Diagrams, Panels 5A and 6A
R-41657, Pumping Station No. 1, Wiring Diagrams, Panels 7A, 8A, 8B, and 8C
R-41658, Pumping Station No. 1, Wiring Diagram, Panels 9A, 9B, and 9C
R-41659, Pumping Station No. 2, Wiring Diagram, Compartments 1A and 1C
R-41665, Pumping Station No. 2, Wiring Diagram, Compartments 2A, 2C, and 2E
R-41666, Pumping Station No. 2, Wiring Diagram, Compartments 3A, 3B, and 3C
R-41676, Pumping Station No. 3, Wiring Diagram, Compartments 1A and 1C
R-41677, Pumping Station No. 3, Wiring Diagram, Compartments 2A, 2C, and 2E
R-41678, Pumping Station No. 3, Wiring Diagram, Compartments 3A, 3B, and 3C
R-41710, Bus Duct Assembly

7. The following Biksun Manufacturing Company, Incorporated, drawings pertaining to TVA contract 77K11-821910:

SO 21851, Sheets 1, 2, 3, 4, 480/120V ac, Panelboards and Transformers