

APPENDIX F
DALLAS FLOODWAY MAINTENANCE PROGRAM SUMMARY

**Dallas Floodway Periodic Inspection No. 9
December 2007
Response - Dallas Flood District**

(1) The following information is to be provided by the levee district sponsor prior to an inspection. This information is used to help evaluate the organizational capability of the levee district to manage the levee system maintenance program.

1. Summary of maintenance performed this reporting period (i.e., prior to 2007 PI #9).

The Flood Control District has performed the following maintenance activities within the Floodway and appurtenances. The Management Information System Reports and Unit Description Summary are included in the appendix.

LEVEE MAINTENANCE:

1.1.1. Cleaning Grates	25,217.0 hrs	\$599,546.00
1.1.2. Levee Scar Repairs	2,554.8 hrs	\$84,889.00
1.1.3. Levee Debris Removal	904.9 hrs	\$20,778.63
1.1.4. Levee Blading	5,362.6 hrs	\$181,324.89
1.1.5. Levee Clearing	1,847.5 hrs	\$46,465.84
1.1.6. Levee Slide Repairs	9,143.4 hrs	\$347,770.02
1.1.7. Levee Restoration	204.3 hrs	\$5,923.88
1.1.8. Floodway Outfall Dredging	931.5 hrs	\$29,997.69
1.1.9. Floodway Earthwork	1,675.7 hrs	\$52,577.09
1.1.10. Floodway Clearing	2,298.0 hrs	\$55,634.31
1.1.11. Floodway Illegal Dumping Removal	685.0 hrs	\$16,145.76
1.1.12. Floodway Outfall Slide Repair	685.0 hrs	\$57,807.28
1.1.13. Blading Floodway Low Road	1,665.5 hrs	\$53,699.87
1.1.14. Sump Cleaning	5,580.5 hrs	\$140,508.58
1.1.15. Desilting Sump Pilot Channels	12,045.9 hrs	\$368,753.36
1.1.16. Sump Rehabilitation	4,037.7 hrs	\$125,417.53
1.1.17. Illegal Dumping/Drift Removal Sump	14,522.7 hrs	\$374,027.03
1.1.18. Sump Slide Repair	7,337.5 hrs	\$237,218.73
1.1.19. Drift Removal (River)	1,569.2 hrs	\$39,273.55
1.1.20. Cleaning Appurtenance	13,195.5 hrs	\$311,686.74

CONCRETE MAINTENANCE:

1.1.21. Concrete Retaining Wall Repairs	16,357.0 hrs	\$383,050.79
1.1.22. Street Station Concrete Repairs	1,261.2 hrs	\$28,656.65
1.1.23. Levee Station Concrete		

Repairs	555.6 hrs	\$12,722.68
1.1.24. Concrete Flume/Headwall Repairs	5,432.8 hrs	\$148,849.88
1.1.25. Concrete Channel Repairs	8,985.9 hrs	\$248,344.16
1.1.26. Concrete Repairs for SCADA, ALERT, FRWS	332.5 hrs	\$7,476.19

CHANNEL MAINTENANCE:

1.1.27. Desilting Lined Detention Basins	445.9 hrs	\$10,476.29
1.1.28. Detention Basin Debris Removal	984.4 hrs	\$22,512.42
1.1.29. Earth Channel Repair	1,200.4 hrs	\$30,343.41
1.1.30. Earth Channel Clearing Response	32,793.2 hrs	\$827,501.98
1.1.31. Earth Channel Scheduled	8,489.3 hrs	\$229,892.01
1.1.32. Lined Channel Clearing Response	4,824.6 hrs	\$120,410.53
1.1.33. Lined Channel Clearing Scheduled	19,636.1 hrs	\$484,921.73
1.1.34. Retention/Detention Basin Maintenance	5,655.1 hrs	\$135,008.94
1.1.35. Culvert/Bridge Cleaning	19,361.3 hrs	\$458,198.52

MOWING MAINTENANCE:

1.1.36. Levee Mowing	15,291.0 hrs	\$432,100.02
1.1.37. Station Mowing	1,805.4 hrs	\$46,015.32
1.1.38. CRMS Mowing	69.4 hrs	\$1,799.30
1.1.39. Floodway Mowing	13,555.0 hrs	\$403,136.32
1.1.40. Creek Mowing	553.0 hrs	\$16,169.02
1.1.41. Sump Mowing	7,884.0 hrs	\$372,083.83
1.1.42. Detention Basin Mowing	7,013.4 hrs	\$267,466.42

ELECTRICAL MAINTENANCE:

1.1.43. Levee Station Motor	2,010.9 hrs	\$184,790.83
1.1.44. Levee Station Switchgear	29,928.5 hrs	\$975,275.71
1.1.45. Street Station Motor	1,435.0 hrs	\$43,636.12
1.1.46. Street Station Switchgear	10,712.8 hrs	\$337,571.92
1.1.47. Electrical Appurtenance	4,336.9 hrs	\$126,661.51

MECHANICAL MAINTENANCE:

1.1.48. Levee Pump	31,797.9 hrs	\$1,998,796.90
1.1.49. Street Station Pump	5,665.4 hrs	\$346,529.28
1.1.50. Mechanical Appurtenance	6,018.6 hrs	\$162,815.34
1.1.51. Floodway Closure Gates	3,033.1 hrs	\$89,544.19
1.1.52. Building Maintenance	3,148.6 hrs	\$82,942.25

TECHNICAL/COMPUTER MAINTENANCE:

1.1.53. SCADA	21,424.6 hrs	\$804,969.16
1.1.54. ALERT	14,642.6 hrs	\$452,817.22
1.1.55. Network	12,815.9 hrs	\$608,253.07
1.1.56. FRWS	20,943.8 hrs	\$651,003.20

2. Summary of maintenance planned next reporting period (2007 to 2012)

The Flood Control District will continue to perform the following maintenance activities within the Floodway and appurtenances during the next inspection period, 2007 to 2012:

- 2.1.1 LEVEE MAINTENANCE
- 2.1.2 CONCRETE MAINTENANCE
- 2.1.3 CHANNEL MAINTENANCE
- 2.1.4 MOWING MAINTENANCE
- 2.1.5 ELECTRICAL MAINTENANCE
- 2.1.6 MECHANICAL MAINTENANCE
- 2.1.7 TECHNICAL/COMPUTER MAINTENANCE

3. Summary of changes to system since last inspection

The Flood Control District has made the following significant changes to the system since 2007:

- 3.1.1. Installed touch screen White Board in the Control/Operations Room
- 3.1.2. Replace 2 Workstations, Weather and Operations #1
- 3.1.3. Replace two servers; Database (SQFC01) and Backup (APFC02)
- 3.1.4. Improved server Intercommunication
- 3.1.5. Upgraded RTU at the Delta Pump Station, 2005
- 3.1.6. Installed Touch Screen at the Delta Pump Station
- 3.1.7. Replaced ALERT Servers, 2003
- 3.1.8. Upgraded network backbone from 10MB to 100MB, 2004
- 3.1.9. Installed Flex Rake and Conveyor at Delta Pump Station in 2005 for trash collection.
- 3.1.10. Installed 2 Trash Racks and Conveyor at the New Hampton Pump Station, 2005
- 3.1.11. Installed cell communication to FRWS locations, 2005
- 3.1.12. Installed domain controller for CITY network, 2005
- 3.1.13. Installed SQL Server database for SCADA and ALERT SQFC00, 2006
- 3.1.14. Installed ALERT Beta server AFPC00, started ALERT Beta, 2006
- 3.1.15. Replaced SCADA Servers, 2007
- 3.1.16. Concrete Repair Section added, 2005
- 3.1.17. CCTV Section added, 2005
- 3.1.18. Combined Earth Channel Maintenance and Lined Channel Maintenance for improve efficiency
- 3.1.19. Customer Response Management System, CRMS, added in 2004 for improved customer service
- 3.1.20. Updated mowing equipment, 2004
- 3.1.21. ISO9001, 2007 and ISO14001, 2008 Certified

4. Problems/ issues requiring the assistance of the US Army Corps of Engineers

The Flood Control District requests the following assistance on these issues:

- 4.1.1. Stop log closure structure located at the railroad track at the DART light rail bridge adjacent to Corinth St Bridge. The railroad track elevation was changed and the stop log structure does not close and seal the opening. This structure needs to be evaluated and changed as necessary.
- 4.1.2. The TRE Railroad crossing located on the upper east levee adjacent to Regal Row there is an elevation difference between the existing levee and where the railroad bridge crosses the levee.
- 4.1.3. DART Light Rail Bridge adjacent to Corinth St, the Stormwater runoff is causing erosion in the levee and is preventing the establishment of vegetation. In addition, the existing erosion protection is inadequate.
- 4.1.4. The Houston Street Viaduct located on the lower west levee there is an elevation difference between the existing levee and where the street bridge crosses the levee.
- 4.1.5. There are currently numerous Geo-Tech investigations ongoing within the floodway and levee template. The laboratory analysis for the Baker Pump Station and the East/West levee adjacent to the Commerce Street Bridge indicate significant sand seems.
- 4.1.6. Assistance/verification to determine the closing elevation for the flood gates and stop log structures are valid. The future flood improvements may alter the current elevations.

(2) Verification that the levee district sponsor has the following general items for all flood damage reduction systems.

- 2.1 Operations and Maintenance Manuals: Levee Owner's Manual, O&M Manuals, and/or manufacturer's operating instructions.
 - 2.1.1 O&M manuals for the floodway are located in the Control Room. In addition, equipment specific O&M manuals are kept within the appropriate section, such as Mechanical, Electrical, and Instrumentation.
- 2.2 Emergency Supplies and Equipment: The sponsor maintains a stockpile of sandbags, shovels, and other flood fight supplies which will adequately supply all needs for the initial days of a flood fight. Sponsor determines required quantity of supplies after consulting with inspector.

2.2.1 SUPPLIES AND RESOURCES

In the event of an emergency, supplies such as sand bags, riprap, fill material, and heavy equipment are available through various out side agencies. City Departments, such as Public Works & Transportation, Dallas Water Utilities, and Park & Recreation will be able to assist during emergency operations. Outside vendor contacts for immediate purchase are provided below and updated as needed:

- 2.2.2 Earthmoving Equipment
Various Master Agreements (0164), expires 4/1/09

- 2.2.3 Riprap
 - Texas Industries
 - 1314 W. Mockingbird
 - Dallas, Texas
 - 972 647 3770
 - Dean Sanders
 - 2.2.4 Sand and Gravel
 - Various Master Agreements (BA0903), expires 02/23/11
 - 2.2.5 Sandbags
 - Concrete Accessories
 - 3130 Commonwealth
 - Dallas, Texas
 - 214 630 4277
 - Nick Ramirez
 - 2.2.6 Portable/Emergency Pumps
 - Barco
 - 2205 S. Industrial
 - Dallas, Texas
 - 214 428 5691
 - 2.2.7 Pipe
 - Advance Drainage Systems (ADS)
 - Ennis, Texas
 - 800 733 9987
 - Jimmy
 - 2.2.8 Laborers
 - Various Master Agreements (BA0816), expires 6/25/11
 - 2.2.9 Lighting Equipment
 - United Rental
 - 1350 South Loop 12
 - Dallas, Texas
 - 972 579 1506
- 2.3 Flood Preparedness and Training: Sponsor has a written system-specific flood response plan and a solid understanding of how to operate, maintain, and staff the FDR system during a flood. Sponsor maintains a list of emergency contact information for appropriate personnel and other emergency response agencies.
- The Flood Control District sponsors site specific training as follows:
- 2.3.1 Pump Station Class – training for all Flood Control District Staff to manually operate each pump station in the event of SCADA Communication loss.
 - 2.3.2 SCADA/ALERT Class – training for selected Flood Control Staff to operate the SCADA/ALERT system during emergency operations. The class is targeted to Base Operators.

- 2.3.3 Shift Supervisor – On-the Job Training as a Base Operator, minimum of 6 months or 3 storm events qualifies them for consideration as a Shift Supervisor.
- 2.3.4 The Flood Control District maintains the “Red Book”, which is a detailed description for flood response, emergency response, franchise utilities and contact information for city, engineering consultants. The Operations Manual provides guidance to the Shift Supervisor and Base Operator on the required actions during any and all storm events.
- 2.3.5 Emergency contact information is kept in the Control Room as follows:
 - Flood Control Staff
 - City of Dallas Staff
 - Engineering Consultants
 - Franchise Utilities
 - Vendors for emergency purchases

(3) Floodwalls

- 3.1 Closure Structures (Stop Log Closures and Gates): Closure structures are in good repair. Placing equipment, stop logs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.

The Flood Control District currently operations and maintains six closure structures. All of the necessary components to closure these structures are located at the Rochester Pump Station, approximately ½ mile away, except for the closure adjacent to the DART Bridge. The closure pieces are housed in a concrete building adjacent to the closure structure. The railroad company can be reached at Dispatch 281 350 7291 or 281 350 7336. The gates on the public right of way have been tested; however, the stop log structures on the Railroad right-of-way have not been tested. The installation instructions are available in the O&M Manual. The closure structures are located at:

3.1.1.1 Budd St/Municipal

- Gate Structure, closed/tested

3.1.1.2 Railroad Track/DART Bridge

- Stop Log Structure, closure logs located in a concrete building adjacent to railroad track. The stop logs have not been tested or installed due to the changes at the railroad track. A repair is currently under consideration by the USACE.

3.1.1.3 Railroad Track/Budd St

- Stop log structure, closure pieces located adjacent to structure

3.1.1.4 Railroad Track @ Bexar/Hwy 175

- Stop log structure, closure pieces located adjacent to railroad track

3.1.1.5 Bexar/Hwy 175

- Gate Structure, closed/tested

3.1.1.6 Railroad Adjacent to Railroad Avenue

- Stop log structure, closure pieces located adjacent to structure

(4) Pump Stations

- 4.1 Pump Stations Operating, Maintenance, Training, & Inspection Records: Operation, maintenance and inspection records are present at the pump station and are being used and updated, and personnel have been trained in pump station operations. Names and last training date are shown in the record book.
 - 4.1.1 Preventative Maintenance is performed at each pump station on a routine basis. Records of work performed are kept in the Mechanical Supervisor's Office and in an electronic format on the Flood Control Document Web-Site. Personnel are trained as necessary and training records are kept the Flood Control District Office.
- 4.2 Pump Station Operations and Maintenance Equipment Manuals: Operation and Maintenance Equipment Manuals and/or posted operating instructions are present and updated as required, and adequately cover all pertinent pump station features. O&M manuals include points of contact for manufacturers and suppliers of major equipment used in the facility.
 - 4.2.1 O&M manuals and equipment manuals are kept in the Mechanical Supervisor's office and in an electronic format on the Flood Control District web-site. A list of equipment vendors and manufacturer's are kept on file and updated as necessary.
- 4.3 Safety Compliance: Safety compliance inspection reports by applicable local, state, or federal agencies available for review.
 - 4.3.1 The USACE inspects the Flood Control District on an annual basis. However, to the best of Flood Control Staff knowledge, there has not been an independent safety inspection in recent years.
- 4.4 Communications: A telephone, cellular phone, two-way radio, or similar device is available to pump station operator and maintenance personnel.
 - 4.4.1 During the time the Control Room is activated, the Shift Supervisor has access to a hard line telephone, cellular phone and two-way radio for communication with the Base Operator. The Shift Supervisor is provided a stipend to carry a cellular phone or a city issued cellular phone is available.

- 4.5 Fencing and Gates: Fencing is in good condition and provides protection against falling or unauthorized access. Gates open and close freely, locks are in place, and there is little corrosion on metal parts.
 - 4.5.1 All of the Pump Stations are protected from public access through a series of locked gates. Approximately 3 Pump Stations are enclosed by an 8-foot cyclone fence. These fences are in good condition and have additional security measures, a second lock, before access is granted. The levees and Pump Stations are patrolled to control unauthorized access. Locks are tested and replaced as necessary.
- 4.6 Pumps: All pumps are properly maintained and lubricated. Systems are periodically tested and documented for review. No vibration, cavitation noises or unusual sounds are noted when the pump is operated. Bearing temperature sensor records don't indicate any problems.
 - 4.6.1 Preventative maintenance is performed on a routine basis on all the levee pumps and associated appurtenances'. The pump stations are equipped with an automatic lubrication system; and each pump is lubricated when in operation. During the time the Control Room is activated, the pump stations in operation are inspected and any unusual noise is addressed and noted in the Base Operators Log. The stations are not manned continuously during operation. Bearing temperatures are not monitored at the Pump Stations.
- 4.7 Motors, Engines, Fans, Gear Reducers, Back Stop Devices, etc.: All items are operational. Preventative maintenance and lubrication is being performed and the system is periodically subjected to performance testing. Instrumentation, alarms, bearing sensors and auto shutdowns are operational.
 - 4.7.1 The pumps are electrical motor driven. Preventative maintenance is performed on a routine basis on all the levee electrical motors and associated appurtenances'. The electrical motors are monitored on a continuous basis during all storm/rain events and any performance issues notated and addressed after the event is over. Back Stop Device, or anti-rotation equipment are in good operational condition. The instrumentation for the electric motors are maintained by the Technician group on a regular basis and problems addressed as necessary. The Flood Control district does not use Engines or Gear Reducers at the pump stations.
- 4.8 Sumps/Wetwell: Clear of debris, sediment, or other obstructions. Procedures are in place to remove debris accumulation during operation.
 - 4.8.1 The sumps and wet wells are cleaned during and after each storm/rain event. Sediment removal is scheduled on as needed basis, approximately 3-5 year interval. Trash removal crews are

scheduled on a rotating basis to insure availability during storm/rain events.

- 4.9 Mechanical Operating Trash Rakes: Drive chain, bearing, gear reducers, and other components are in good operating condition and are being properly maintained.
 - 4.9.1 Preventative maintenance is performed on a routine on all the mechanical trash racks. The mechanical trash racks are monitored on a continuous basis during all storm/rain events and any performance issues notated and addressed after the event is over.
- 4.10 Non-Mechanical Trash Racks: Trash racks are fastened in place and properly maintained.
 - 4.10.1 Preventative maintenance is performed on the non-mechanical trash racks. The non-mechanical trash racks are monitored during all storm/rain events and any performance issues notated and addressed after the event is over. Trash removal equipment is kept at each Pump Stations to insure availability during a storm/rain event.
- 4.11 Fuel System for Pump Engines: Fuel system is operational, day tank present and operational, fuel fresh and rotated regularly.
 - 4.11.1 The Flood Control District does not utilize fuel operated pumps or engines at the Pump Stations.
- 4.12 Power Source: The normal power source and backup generators, if installed, are operational, properly exercised and well maintained. Surge protection, grounding, lightning protection, transformers, and automatic/manual transfer of main power to backup system is working.
 - 4.12.1 The electrical service provider inspects their equipment and appurtenance and reports are available on request. Backup generators are not utilized at the Pump Stations.
- 4.13 Electrical Systems: Operational and maintained free of damage, corrosion, and debris. Preventative maintenance and system testing is being performed periodically.
 - 4.13.1 Electrical Systems, such as MCC, switchgear, and transformers are maintained on a routine basis. Records are kept in the Electrical Supervisors Office and in an electronic format.
- 4.14 Megger Testing on Pump Motors and Critical Power Cables: Results of Megger tests on pump motors or critical power cables show that the insulation meets manufacturer's or industry standards. Tested within the last year.
 - 4.14.1 Megger Testing is conducted every 6-month on all electric motors. However, the critical power cables have not been Megger Tested

in recent years. Records are kept in the Electrical Supervisors Office and in an electronic format.

- 4.15 Enclosures, Panels, Conduit and Ducts: All enclosures, panels, conduits, and ducts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.
 - 4.15.1 Preventative Maintenance and inspections are conducted on a routine basis on Panels, Conduits and Ducts. Appropriate corrective measures are scheduled and completed in a timely manner. Records are kept in the Electrical Supervisors Office and in an electronic format.
- 4.16 Intake and Discharge Pipelines: Intake and discharge pipelines have no corrosion and paint is intact, except for minor touch up required. Pipe couplings and anchors have no leakage or corrosion.
 - 4.16.1 Intake and Discharge piping are inspected on a routine basis. However, interior inspection of the discharge piping is not routinely scheduled and has not been completed. Appropriate corrective measures are scheduled and completed in a timely manner. Couplings and anchors are checked during storm/rain events to insure there is no leakage.
- 4.17 Sluice/Slide Gates: Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.
 - 4.17.1 Preventative maintenance is conducted on a routine basis to insure sluice/slide gates operate as intended. Records are kept in the Mechanical Supervisors Office and in an electronic format.
- 4.18 Flap Gates/Flap Valves/Pinch Valves: Gates/valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.
 - 4.18.1 Preventative maintenance and inspections are conducted to insure the flap gates/valves operate as intended. Pinch Valves are not utilized by the Flood Control District. Records are kept in the Mechanical Supervisors Office and in an electronic format.
- 4.19 Cranes: Cranes operational and have been inspected and load tested in accordance with applicable standards within the last year. Documentation is on hand.
 - 4.19.1 Preventative Maintenance is conducted on a routine basis to insure the cranes are fully operational. Load testing has not been complete recently. This testing will be included as per industry standards. Records are kept in the Mechanical Supervisors Office and in an electronic format.

- 4.20 Other Metallic Items (Equipment, Ladders, Platform Anchors, etc): All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.
 - 4.20.1 Preventative Maintenance and inspections are conducted on Pump Station metallic parts not previously inspected or mentioned above. Appropriate corrective measures are scheduled and completed in a timely manner.