ANNEX C-1
Civil Plates

- Existing Condition Drainage Map
- Proposed Condition Drainage Map
- Overall Site Plan for Recommended Plan
- Overall Site Plan for Recommended Plan with FEMA FIRM Floodplains
- Section Location Plan for Recommended Plan
- Reservoir West Inflow-Outflow Canal (CNL-3) Site Plan for Recommended Plan
- Earthwork Typical Sections for Recommended Plan
- PS-1 Pump Station and S-84+ Spillway Site Plan for Recommended Plan
- PS-1 Pump Station Section for Recommended Plan
- S-84+ Spillway Section for Recommended Plan
- PS-2 Pump Station and Adjacent Structures Site Plan for Recommended Plan
- Sections for Reservoir Dam Structures for Recommended Plan

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
EXISTING CONDITION DRAINAGE MAP

DRAWING PREPARED BY J-TECH
11/24/2023

NORTH
0 3,000' 6,000'
LAKE ISTOKPOGA
ISTOKPOGA CANAL
GR 621
US HWY 98
CSX RAILROAD
KISSIMMEE RIVER
UNDERHILL RD
BUTLERS BLUFF RD
LARSON DAIRY RD
CR 721
SR 70
SW RUCKS DAIRY RD
C-41A
C-41
C-38
WOERNER SOUTH WETLAND RESTORATION PROJECT
BRIGHTON VALLEY IMPOUNDMENT
EXIST. S-67
EXIST. S-68 & S-68X
EXIST. AGI R1 CONTROL EL. = 33.8
EXIST. AGI R6 CONTROL EL. = 35.3
EXIST. AGI R5 CONTROL EL. = 27.8
EXIST. AGI R7 CONTROL EL. = 37.8
EXIST. AGI R7 INFLOW PUMP STA. & OUTFALL
EXIST. AGI R4 CONTROL EL. = 43.3
EXIST. AGI R4 INFLOW PUMP STA. & OUTFALL
EXIST. AGI R3A CONTROL EL. = 43.8
EXIST. AGI R3A OUTFALL
EXIST. AGI R3B CONTROL EL. = 41.8
EXIST. BASINGER TRACT PROPERTY BOUNDARY
EXIST. AGI R11 CONTROL EL. = 39.8
EXIST. AGI R11 OUTFALL
EXIST. AGI R12 INFLOW PUMP STA.
EXIST. AGI R12 CONTROL EL. = 36.8
EXIST. AGI R12 OUTFALL
POTENTIAL SITE FOR AGI-1
RESERVOIR SITE LIMITS OF CONSTRUCTION
EXIST. PC27N (OUTFLOW TO C-41A)
EXIST. BASINGER TRACT STRUCTURE 33 (OUTFLOW TO C-41A)
EXIST. PC25N (OUTFLOW TO C-41A)
EXIST. PC23N (OUTFLOW TO C-41A)
EXIST. S-82
EXIST. PC21N (OUTFLOW TO C-41A)
LOCATION OF PC22N BEFORE IT WAS REMOVED UNDER WOERNER SOUTH WETLAND RESTORATION PROJECT (SFWMD ERP NO. 28-102464-P)
EXIST. S-83 & S-83X Normal HW Operating Range: 30.6 - 31.0
EXIST. PC20N (OUTFLOW TO C-41A)
EXIST. PC18N (OUTFLOW TO C-41A)
EXIST. PC19S (OUTFLOW TO C-41A)
EXIST. PC17N (OUTFLOW TO C-41A)
EXIST. PC16S (OUTFLOW TO C-41A)
EXIST. PC15N (OUTFLOW TO C-41A)
EXIST. PC14S (OUTFLOW TO C-41A)
EXIST. PC13N (OUTFLOW TO C-41A)
EXIST. PC12S (OUTFLOW TO C-41A)
EXIST. PC11N (OUTFLOW TO C-41A)
EXIST. PC10N (OUTFLOW TO C-41A)
EXIST. S-65D & S-65DX2 (TO REMAIN)
EXIST. S-65DX1 (TO REMAIN)
EXIST. S-65E & S-65EX1 Normal HW Operating Range: 19.6 - 20.0
EXIST. S-65EW
EXIST. S-84 & S-84X Normal HW Operating Range: 23.1 - 24.0
LEGEND
EXISTING WATER MANAGEMENT FEATURES
EXISTING BASIN/SUBBASIN BOUNDARY
BASINGER TRACT BASIN 1 (DRAINS TO ISTOKPOGA CANAL)
BASINGER TRACT BASIN 2 (DRAINS TO C-41A)
BASINGER TRACT BASIN 3 (DRAINS TO KISSIMMEE RIVER / C-38)
BASINGER TRACT BASIN 4 (DRAINS TO C-41A THROUGH RESERVOIR SITE)
OFFISTE DRAINAGE AREA (DRAINS TO C-41A THROUGH RESERVOIR SITE)
RESERVOIR SITE LIMITS OF CONSTRUCTION (DRAINS TO C-41A)
EXISTING DRAINAGE FLOW DIRECTION ARROW
EXISTING PUMP STATION WITH FLOW DIRECTION ARROW
EXISTING CONTROL STRUCTURE WITH FLOW DIRECTION ARROW
EXISTING UNGATED CULVERT
EXISTING C-41A CANAL PROJECT CULVERT

NOTES:

1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). FEET NGVD29 = FEET NAVD88 + 1.2 FEET.

2. CONTROL ELEVATION SHOWN FOR EACH ABOVE GROUND IMPOUNDMENT (AGI) WITHIN THE BASINGER TRACT IS BASED ON THE REPORT TITLED "ENGINEERING REPORT OF PROPOSED WATER MANAGEMENT BASINS III & IV LYKES BROS. - BASINGER TRACT", BY HUTCHEON ENGINEERS, DATED 10/12/1984.

3. BASINGER TRACT BASIN BOUNDARIES BASED ON REVIEW OF TOPOGRAPHY AND EXISTING STORMWATER MANAGEMENT FEATURES WITHIN THE BASINGER TRACT AS WELL AS BASINGER TRACT BASIN BOUNDARIES SHOWN ON SHEETS C1 AND C2 IN SECTION V ENCLOSURES IN THE REPORT TITLED "ENGINEERING REPORT OF PROPOSED WATER MANAGEMENT BASINS III & IV LYKES BROS. - BASINGER TRACT", BY HUTCHEON ENGINEERS, DATED 10/12/1984.

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LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
PROPOSED CONDITION DRAINAGE MAP

DRAWING PREPARED BY J-TECH 12/20/2023

LEGEND
EXISTING WATER MANAGEMENT FEATURES
OFFSITE DRAINAGE AREA (ODA) BOUNDARY
ABOVE GROUND IMPOUNDMENT (AGI) AND/OR ODA BOUNDARY
BASINGER TRACT BASIN 4 ODA TO DRAIN DIRECTLY/INDIRECTLY TO REACH 1 OF CNL-1
BASINGER TRACT BASIN 4 ODA TO DRAIN DIRECTLY/INDIRECTLY TO REACH 2 OF CNL-1
OTHER ODA TO DRAIN DIRECTLY TO CNL-1 OR ODCD-1
EXISTING PUMP STATION WITH FLOW DIRECTION ARROW
EXISTING CONTROL STRUCTURE WITH FLOW DIRECTION ARROW
EXISTING C-41A CANAL PROJECT CULVERT
LOCAR PROPOSED WATER MANAGEMENT FEATURES
ABOVE GROUND IMPOUNDMENT AGI-1 (ODA 9) PROPOSED LIMITS OF CONSTRUCTION
FIXED WEIR OUTFALL/OVERFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
PERIMETER CANAL ADJUSTABLE WEIR STRUCTURE WITH FLOW DIRECTION ARROW
UNGATED OVERFLOW SPILLWAY WITH FLOW DIRECTION ARROW
UNGATED CULVERT WITH FLOW DIRECTION ARROWS
GATED BI-DIRECTIONAL FLOW CONTROL STRUCTURE WITH FLOW DIRECTION ARROWS
GATED OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
PUMP STATION WITH FLOW DIRECTION ARROW
DRAINAGE/CANAL FLOW DIRECTION ARROW
NORTH
0 3,000' 6,000'
LAKE ISTOKPOGA
ISTOKPOGA CANAL
EXIST. S-67 (TO REMAIN)
CR 621
US HWY 98
CSX RAILROAD
KISSIMMEE RIVER
EXIST. AGI R1 (TO REMAIN)
EXIST. S-68 & S-68X (TO REMAIN)
EXIST. AGI R6 (TO REMAIN)
EXIST. AGI R5 (TO REMAIN)
EXIST. AGI R3A (TO REMAIN)
EXIST. AGI R3B (TO REMAIN)
ODA 11A
ODA 14A
ODA 10
ODA 12
ODA 8
ODA 3
ODA 11B
ODA 13
ODA 9
ODA 1
ODA 2
ODA 4
ODA 5
ODA 6
ODA 7A
ODA 7B
EXIST. AGI R7 (TO REMAIN)
EXIST. AGI R4 (TO REMAIN)
EXIST. AGI R4 INFLOW PUMP STA. & OUTFALL (TO REMAIN)
EXIST. AGI R7 PUMP STA. & OUTFALL (TO REMAIN) (SEE NOTE 2D)
AGI-1 INFLOW PUMP STA. (AGI-PS-1) (SEE NOTE 2C)
EXIST. AGI R11 (TO REMAIN)
EXIST. BASINGER TRACT PROPERTY BOUNDARY (TO REMAIN)
UNDERHILL RD
EXIST. S-65D & S-65DX2 (TO REMAIN)
EXIST. S-65DX1 (TO REMAIN)
POTENTIAL SITE FOR AGI-1
AGI-PS-2 (SEE NOTE 2F)
EXIST. AGI R11 OUTFALL TO REMAIN (SEE NOTE 2E)
AGI-1 OUTFALL (AGI-OS-1) (SEE NOTE 2B)
EXIST. ODA NO. 3 OUTFALL STRUCT. (TO REMAIN)
OOS-1
OOS-2
OOS-3
BUTLERS BLUFF RD
EXIST. AGI R12 WEST INFLOW PUMP STA. TO BE REMOVED
ODCD-3 C/L
OOS-8
PCW-6
CNL-1 REACH 2B TYP. D.S.C.E. 37.8 TYP. W.S.C.E. 38.5
CNL-1 REACH 3A TYP. D.S.C.E. 38.3 TYP. W.S.C.E. 39.1
PCW-4
PCW-5
CNL-1 REACH 1B TYP. D.S.C.E. 33.3 TYP. W.S.C.E. 34.0
CNL-1 REACH 2A TYP. D.S.C.E. 35.2 TYP. W.S.C.E. 35.5
PCW-3
RESERVOIR SITE LIMITS OF CONSTRUCTION
PERIMETER CANAL (CNL-1) C/L
PERIMETER DAM C/L
EXIST. AGI R12 EAST INFLOW PUMP STA. TO BE REPLACED BY AGI-PS-2 (SEE NOTE 2F)
EXIST. AGI R12 TO BE DECOMISSIONED (SEE NOTE 2A)
PERIMETER CNL. UNGATED CULVERT (PCCU-1)
EXIST. AGI R12 OUTFALL (TO REMAIN OR BE REMOVED)
PCW-7
LOCAR WEST CELL NFSL = 51.7
LOCAR EAST CELL NFSL = 51.7
LARSON DAIRY RD
OOS-4
EXIST. S-82 (TO REMAIN)
EXIST. PC21N (TO REMAIN)
PCW-2
ODCD-2 C/L
DIVIDER DAM C/L
EXIST. S-83 & S-83X (TO REMAIN) Normal HW Operating Range: 30.6 - 31.0
OOS-7
PERIM. CNL. WEIR (PCW-1)
UNGATED OVERFLOW SPILLWAY (OS-2) (OUTFLOW TO CNL-1)
BORROW AREA (TYP)
PCW-8
CR 721
PCOS-4 (OUTFLOW TO PC20N)
CNL-1 REACH 7
CNL-1 REACH 7 TYP. D.S.C.E. 24.0 TYP. W.S.C.E. 24.0
PCCU-4
PCCU-3
PCOS-3 (OUTFLOW TO PC18N)
EXIST. PC18N (TO REMAIN)
EXIST. PC20N (TO REMAIN)
PCW-9
OOS-5
OOS-6
WOERNER SOUTH WETLAND RESTORATION PROJECT
PCOS-2 (OUTFLOW TO C-41A, TO REPLACE PC17N)
EXIST. PC17N TO BE REPLACED
OFFSITE DRAINAGE COLLECTION DITCH (ODCD-1) C/L (SEE NOTE 4)
ODCD-OS-1 (OUTFLOW TO PC15N)
PCCU-2
EXIST. PC15N (TO REMAIN)
PCW-10
TEMP. CONSTRUCTION OFFICE & STAGING AREA
C-38
EXIST. S-65E & S-65EX1 (TO REMAIN) Normal HW Operating Range: 19.6 - 20.0
SR 70
EXIST. FBR STRUCTURES & CULVERTS TO BE REMOVED
EXIST. PC13N (TO REMAIN)
1,500 CFS ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE (CU-1B) (OUTFLOW TO CNL-2)
RES. EAST INFLOW-OUTFLOW CANAL (CNL-2) C/L
UNGATED OVERFLOW SPILLWAY (OS-1) (OUTFLOW TO CNL-1)
PERIMETER CNL. OVERFLOW STRUCT. (PCOS-1) (OUTFLOW TO CNL-2)
C-41
C-41A
BRIGHTON VALLEY IMPOUNDMENT
SW RUCKS DAIRY RD
EXIST. S-65EW (TO REMAIN)

NOTES:

1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). FEET NGVD29 = FEET NAVD88 + 1.2 FEET.

2. AS SHOWN ON THIS OVERALL SITE PLAN, THE CONSTRUCTION OF THE RESERVOIR INCLUDES PROPOSED MODIFICATIONS TO THE EXISTING BASINGER TRACT STORMWATER MANAGEMENT SYSTEM SO THAT STORMWATER DISCHARGED FROM ODAs 1 THROUGH 3, AND 8 THROUGH 14B WILL BE CONVEYED TO CNL-1, FOR ULTIMATE DISCHARGE TO C-41A. THE FOLLOWING TASKS WILL BE COMPLETED DURING THE PED PHASE, CONCERNING THESE PROPOSED MODIFICATIONS:
- DESIGN OF PROPOSED MODIFICATIONS (INCLUDING THE LOCATION, LAYOUT, NUMBER AND TYPE OF IMPROVEMENTS) WILL BE FINALIZED BASED ON ADDITIONAL REVIEW AND COORDINATION WITH THE BASINGER TRACT PROPERTY OWNER.
- FINAL DESIGN OF PROPOSED MODIFICATIONS, INCLUDING LIMITS OF CONSTRUCTION AND ANY REQUIRED TEMPORARY CONSTRUCTION EASEMENTS, WLL BE APPROVED IN WRITING BY THE BASINGER TRACT PROPERTY OWNER.
- THE REQUIRED SFWMD ERP MODIFICATION TO PERMIT NO. 28-00146-S/W WILL OBTAINED FOR THE PROPOSED MODIFICATIONS.

2A. AGI R12 TO BE DECOMMISSIONED BY REMOVING ITS TWO INFLOW PUMP STATIONS AND EXCAVATING DRAINAGE OPENINGS IN ITS PERIMETER LEVEE (SPACING & SIZE OF OPENINGS TBD DURING PED PHASE), EXCLUDING THE PERIMTER LEVEE SEGEMENTS BORDERING ODAs 11B & 13. PERIMETER LEVEE SEGMENTS BORDERING ODAs 11B & 13, WILL NOT BE DEGRADED, BUT REMAIN IN THEIR EXISTING CONDITION. THE BOTTOM OF THE PERIMETER LEVEE DRAINAGE OPENINGS WILL MATCH THE ADJACENT GROUND SURFACE.

2B. AGI-OS-1 WILL DISCHARGE TO CNL-1 REACH 1B.

2C. AGI-PS-1 WILL PUMP WATER FROM THE EXISTING ODA 11B PERIMETER DITCH TO AGI-1 (ODA 9).

2D. EXISTING AGI R7 OUTFALL CONTROL STRUCTURE WILL DISCHARGE TO AGI-1.

2E. EXISTING AGI R11 OUTFALL CONTROL STRUCTURE WILL DISCHARGE TO CNL-1 REACH 2A. PROJECT INCLUDES CONSTRUCTION OF A DITCH THAT WILL EXTEND FROM EXISTING AGI R11 OUTFALL TO THE RESERVOIR PERIMETER MAINTENENCE ROAD, AND THE INSTALLATION OF A CROSS-DRAIN CULVERT UNDER THE ROAD, TO CONNECT THE DITCH TO CNL-1 REACH 2A. SINCE AGI-PS-2 WILL DISCHARGE TO AGI R11 (SEE NOTE 2F), THE EXISTING AGI R11 OUTFALL CONTROL STRUCTURE WILL BE MODIFIED AS NEEDED TO ACCOMODATE THE ADDITIONAL INFLOW FROM AG1-PS-2.

2F. EXISTING AGI R12 EAST INFLOW PUMP STATION TO BE REPLACED BY AGI-PS-2, WHICH WILL PUMP WATER FROM THE EXISTING ODA 14B PERIMETER DITCH TO AGI R11 (ODA 13).

2G. OFFSITE OUTFALL STRUCTURES OOS-1 THROUGH OOS-3, AND OOS-8 WILL EACH DISCHARGE TO CNL-1.

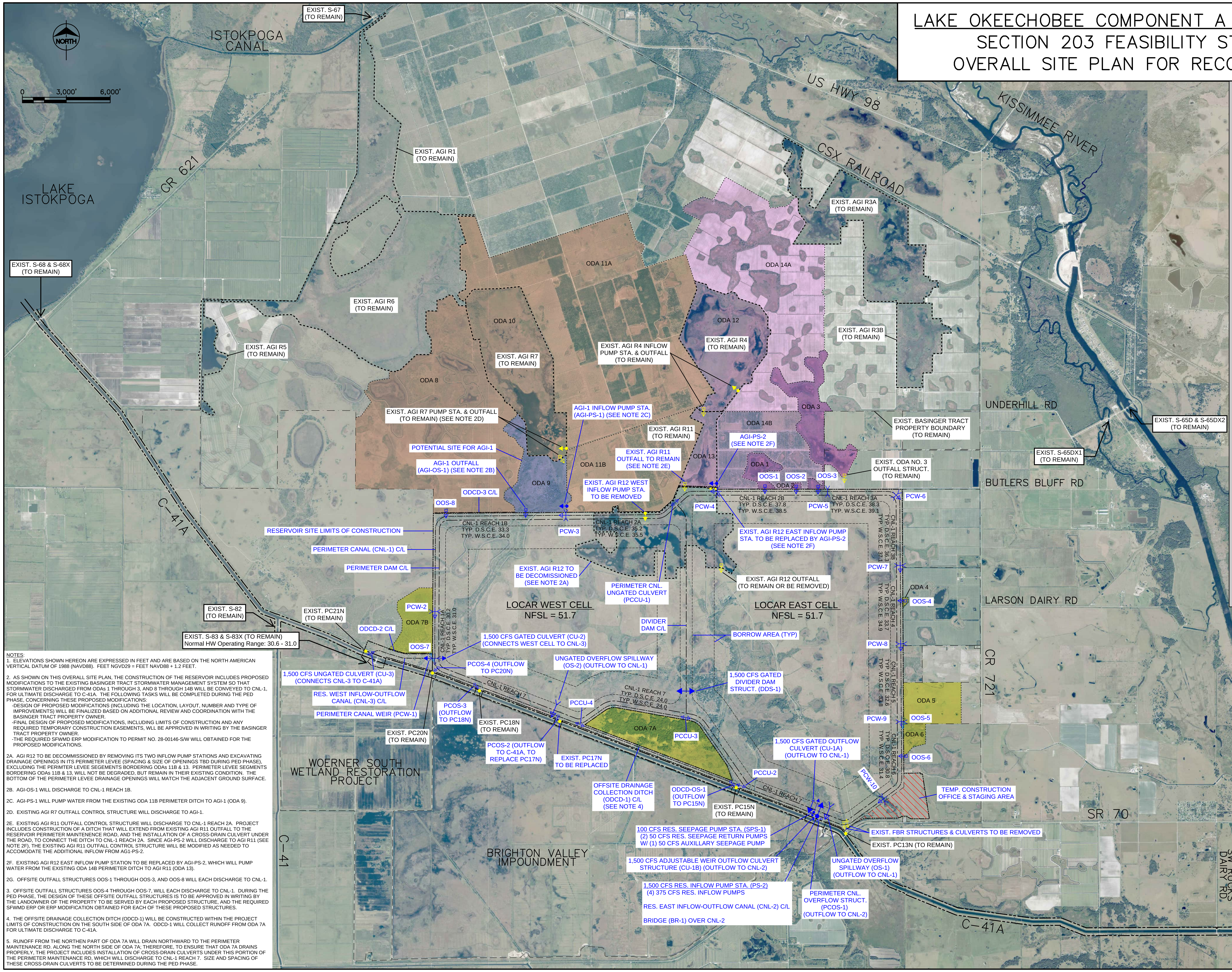
3. OFFSITE OUTFALL STRUCTURES OOS-4 THROUGH OOS-7, WILL EACH DISCHARGE TO CNL-1. DURING THE PED PHASE, THE DESIGN OF THESE OFFSITE OUTFALL STRUCTURES IS TO BE APPROVED IN WRITING BY THE LANDOWNER OF THE PROPERTY TO BE SERVED BY EACH PROPOSED STRUCTURE, AND THE REQUIRED SFWMD ERP OR ERP MODIFICATION OBTAINED FOR EACH OF THESE PROPOSED STRUCTURES.

4. THE OFFSITE DRAINAGE COLLECTION DITCH (ODCD-1) WILL BE CONSTRUCTED WITHIN THE PROJECT LIMITS OF CONSTRUCTION ON THE SOUTH SIDE OF ODA 7A. ODCD-1 WILL COLLECT RUNOFF FROM ODA 7A FOR ULTIMATE DISCHARGE TO C-41A.

5. RUNOFF FROM THE NORTHEN PART OF ODA 7A WILL DRAIN NORTHWARD TO THE PERIMETER MAINTENANCE RD. ALONG THE NORTH SIDE OF ODA 7A; THEREFORE, TO ENSURE THAT ODA 7A DRAINS PROPERLY, THE PROJECT INCLUDES INSTALLATION OF CROSS-DRAIN CULVERTS UNDER THIS PORTION OF THE PERIMETER MAINTENANCE RD, WHICH WILL DISCHARGE TO CNL-1 REACH 7. SIZE AND SPACING OF THESE CROSS-DRAIN CULVERTS TO BE DETERMINED DURING THE PED PHASE.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
OVERALL SITE PLAN FOR RECOMMENDED PLAN

DRAWING PREPARED BY J-TECH 12/20/2023



NORTH
0 3,000' 6,000'
EXIST. S-67 (TO REMAIN)
ISTOKPOGA CANAL
LAKE ISTOKPOGA
CR 621
US HWY 98
CSX RAILROAD
KISSIMMEE RIVER
EXIST. AGI R1 (TO REMAIN)
EXIST. S-68 & S-68X (TO REMAIN)
EXIST. AGI R6 (TO REMAIN)
EXIST. AGI R5 (TO REMAIN)
EXIST. AGI R3A (TO REMAIN)
EXIST. AGI R3B (TO REMAIN)
ODA 11A
ODA 14A
ODA 10
ODA 12
EXIST. AGI R7 (TO REMAIN)
EXIST. AGI R4 (TO REMAIN)
EXIST. AGI R4 INFLOW PUMP STA. & OUTFALL (TO REMAIN)
ODA 8
ODA 3
ODA 14B
UNDERHILL RD
EXIST. AGI R7 PUMP STA. & OUTFALL (TO REMAIN) (SEE NOTE 2D)
AGI-1 INFLOW PUMP STA. (AGI-PS-1) (SEE NOTE 2C)
EXIST. AGI R11 (TO REMAIN)
AGI-PS-2 (SEE NOTE 2F)
EXIST. BASINGER TRACT PROPERTY BOUNDARY (TO REMAIN)
EXIST. S-65D & S-65DX2 (TO REMAIN)
EXIST. S-65DX1 (TO REMAIN)
POTENTIAL SITE FOR AGI-1
AGI-1 OUTFALL (AGI-OS-1) (SEE NOTE 2B)
ODA 11B
ODA 13
EXIST. AGI R11 OUTFALL TO REMAIN (SEE NOTE 2E)
ODA 1
ODA 2
OOS-1
OOS-2
OOS-3
EXIST. ODA NO. 3 OUTFALL STRUCT. (TO REMAIN)
BUTLERS BLUFF RD
ODA 9
OCDC-3 C/L
OOS-8
EXIST. AGI R12 WEST INFLOW PUMP STA. TO BE REMOVED
CNL-1 REACH 2B TYP. D.S.C.E. 37.8 TYP. W.S.C.E. 38.5
CNL-1 REACH 3A TYP. D.S.C.E. 38.3 TYP. W.S.C.E. 39.1
PCW-4
PCW-5
PCW-6
CNL-1 REACH 1B TYP. D.S.C.E. 33.3 TYP. W.S.C.E. 34.0
CNL-1 REACH 2A TYP. D.S.C.E. 35.2 TYP. W.S.C.E. 35.5
RESERVOIR SITE LIMITS OF CONSTRUCTION
PCW-3
EXIST. AGI R12 EAST INFLOW PUMP STA. TO BE REPLACED BY AGI-PS-2 (SEE NOTE 2F)
PERIMETER CANAL (CNL-1) C/L
PERIMETER DAM C/L
EXIST. AGI R12 TO BE DECOMMISSIONED (SEE NOTE 2A)
PCW-7
EXIST. AGI R12 OUTFALL (TO REMAIN OR BE REMOVED)
PERIMETER CNL. UNGATED CULVERT (PCCU-1)
ODA 4
OOS-4
LARSON DAIRY RD
LOCAR WEST CELL NFSL = 51.7
LOCAR EAST CELL NFSL = 51.7
PCW-2
ODA 7B
EXIST. S-82 (TO REMAIN)
EXIST. PC21N (TO REMAIN)
ODCD-2 C/L
DIVIDER DAM C/L
EXIST. S-83 & S-83X (TO REMAIN) Normal HW Operating Range: 30.6 - 31.0
1,500 CFS GATED CULVERT (CU-2) (CONNECTS WEST CELL TO CNL-3)
BORROW AREA (TYP)
OOS-7
PCW-8
CR 721
1,500 CFS UNGATED CULVERT (CU-3) (CONNECTS CNL-3 TO C-41A)
PCOS-4 (OUTFLOW TO PC20N)
UNGATED OVERFLOW SPILLWAY (OS-2) (OUTFLOW TO CNL-1)
1,500 CFS GATED DIVIDER DAM STRUCT. (DDS-1)
RES. WEST INFLOW-OUTFLOW CANAL (CNL-3) C/L
CNL-1 REACH 7
PCOS-3 (OUTFLOW TO PC18N)
PCCU-4
CNL-1 REACH 7 TYP. D.S.C.E. 24.0 TYP. W.S.C.E. 24.0
ODA 5
PERIMETER CANAL WEIR (PCW-1)
EXIST. PC18N (TO REMAIN)
ODA 7A
PCW-9
OOS-5
EXIST. PC20N (TO REMAIN)
PCCU-3
ODA 6
PCOS-2 (OUTFLOW TO C-41A, TO REPLACE PC17N)
EXIST. PC17N TO BE REPLACED
1,500 CFS GATED OUTFLOW CULVERT (CU-1A) (OUTFLOW TO CNL-1)
OOS-6
WOERNER SOUTH WETLAND RESTORATION PROJECT
PCCU-2
PCW-10
OFFSITE DRAINAGE COLLECTION DITCH (ODCD-1) C/L (SEE NOTE 4)
ODCD-OS-1 (OUTFLOW TO PC15N)
EXIST. PC15N (TO REMAIN)
TEMP. CONSTRUCTION OFFICE & STAGING AREA
SR 70
C-38
EXIST. S-65E & S-65EX1 (TO REMAIN) Normal HW Operating Range: 19.6 - 20.0
100 CFS RES. SEEPAGE PUMP STA. (SPS-1) (2) 50 CFS RES. SEEPAGE RETURN PUMPS W/ (1) 50 CFS AUXILLARY SEEPAGE PUMP
EXIST. FBR STRUCTURES & CULVERTS TO BE REMOVED
EXIST. PC13N (TO REMAIN)
C-41
BRIGHTON VALLEY IMPOUNDMENT
1,500 CFS ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE (CU-1B) (OUTFLOW TO CNL-2)
UNGATED OVERFLOW SPILLWAY (OS-1) (OUTFLOW TO CNL-1)
EXIST. S-65EW (TO REMAIN)
SW RUCKS DAIRY RD.
1,500 CFS RES. INFLOW PUMP STA. (PS-2) (4) 375 CFS RES. INFLOW PUMPS
RES. EAST INFLOW-OUTFLOW CANAL (CNL-2) C/L
BRIDGE (BR-1) OVER CNL-2
PERIMETER CNL. OVERFLOW STRUCT. (PCOS-1) (OUTFLOW TO CNL-2)
C-41A
GATED SPILLWAY (S-84+) (TO REPLACE S-84 & S-84X)
EXIST. S-84 & S-84X TO BE REPLACED Normal HW Operating Range: 23.1 - 24.0
1,500 CFS PUMP STA. (PS-1) (4) 375 CFS PUMPS

LEGEND

EXISTING WATER MANAGEMENT FEATURES

- OFFSITE DRAINAGE AREA (ODA) BOUNDARY
- ABOVE GROUND IMPOUNDMENT (AGI) AND/OR ODA BOUNDARY
- BASINGER TRACT BASIN 4 ODA TO DRAIN DIRECTLY/INDIRECTLY TO REACH 1 OF CNL-1
- BASINGER TRACT BASIN 4 ODA TO DRAIN DIRECTLY/INDIRECTLY TO REACH 2 OF CNL-1
- OTHER ODA TO DRAIN DIRECTLY TO CNL-1 OR ODCD-1
- EXISTING PUMP STATION WITH FLOW DIRECTION ARROW
- EXISTING CONTROL STRUCTURE WITH FLOW DIRECTION ARROW
- EXISTING C-41A CANAL PROJECT CULVERT

LOCAR PROPOSED WATER MANAGEMENT FEATURES

- ABOVE GROUND IMPOUNDMENT AGI-1 (ODA 9) PROPOSED LIMITS OF CONSTRUCTION
- FIXED WEIR OUTFALL/OVERFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PERIMETER CANAL ADJUSTABLE WEIR STRUCTURE WITH FLOW DIRECTION ARROW
- UNGATED OVERFLOW SPILLWAY WITH FLOW DIRECTION ARROW
- UNGATED CULVERT WITH FLOW DIRECTION ARROWS
- GATED BI-DIRECTIONAL FLOW CONTROL STRUCTURE WITH FLOW DIRECTION ARROWS
- GATED OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PUMP STATION WITH FLOW DIRECTION ARROW

NOTES:

1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). FEET NGVD29 = FEET NAVD88 + 1.2 FEET.

2. AS SHOWN ON THIS OVERALL SITE PLAN, THE CONSTRUCTION OF THE RESERVOIR INCLUDES PROPOSED MODIFICATIONS TO THE EXISTING BASINGER TRACT STORMWATER MANAGEMENT SYSTEM SO THAT STORMWATER DISCHARGED FROM ODAs 1 THROUGH 3, AND 8 THROUGH 14B WILL BE CONVEYED TO CNL-1, FOR ULTIMATE DISCHARGE TO C-41A. THE FOLLOWING TASKS WILL BE COMPLETED DURING THE PED PHASE, CONCERNING THESE PROPOSED MODIFICATIONS:
   - -DESIGN OF PROPOSED MODIFICATIONS (INCLUDING THE LOCATION, LAYOUT, NUMBER AND TYPE OF IMPROVEMENTS) WILL BE FINALIZED BASED ON ADDITIONAL REVIEW AND COORDINATION WITH THE BASINGER TRACT PROPERTY OWNER.
   - -FINAL DESIGN OF PROPOSED MODIFICATIONS, INCLUDING LIMITS OF CONSTRUCTION AND ANY REQUIRED TEMPORARY CONSTRUCTION EASEMENTS, WLL BE APPROVED IN WRITING BY THE BASINGER TRACT PROPERTY OWNER.
   - -THE REQUIRED SFWMD ERP MODIFICATION TO PERMIT NO. 28-00146-S/W WILL OBTAINED FOR THE PROPOSED MODIFICATIONS.

2A. AGI R12 TO BE DECOMMISSIONED BY REMOVING ITS TWO INFLOW PUMP STATIONS AND EXCAVATING DRAINAGE OPENINGS IN ITS PERIMETER LEVEE (SPACING & SIZE OF OPENINGS TBD DURING PED PHASE), EXCLUDING THE PERIMTER LEVEE SEGEMENTS BORDERING ODAs 11B & 13. PERIMETER LEVEE SEGMENTS BORDERING ODAs 11B & 13, WILL NOT BE DEGRADED, BUT REMAIN IN THEIR EXISTING CONDITION. THE BOTTOM OF THE PERIMETER LEVEE DRAINAGE OPENINGS WILL MATCH THE ADJACENT GROUND SURFACE.

2B. AGI-OS-1 WILL DISCHARGE TO CNL-1 REACH 1B.

2C. AGI-PS-1 WILL PUMP WATER FROM THE EXISTING ODA 11B PERIMETER DITCH TO AGI-1 (ODA 9).

2D. EXISTING AGI R7 OUTFALL CONTROL STRUCTURE WILL DISCHARGE TO AGI-1.

2E. EXISTING AGI R11 OUTFALL CONTROL STRUCTURE WILL DISCHARGE TO CNL-1 REACH 2A. PROJECT INCLUDES CONSTRUCTION OF A DITCH THAT WILL EXTEND FROM EXISTING AGI R11 OUTFALL TO THE RESERVOIR PERIMETER MAINTENENCE ROAD, AND THE INSTALLATION OF A CROSS-DRAIN CULVERT UNDER THE ROAD, TO CONNECT THE DITCH TO CNL-1 REACH 2A. SINCE AGI-PS-2 WILL DISCHARGE TO AGI R11 (SEE NOTE 2F), THE EXISTING AGI R11 OUTFALL CONTROL STRUCTURE WILL BE MODIFIED AS NEEDED TO ACCOMODATE THE ADDITIONAL INFLOW FROM AG1-PS-2.

2F. EXISTING AGI R12 EAST INFLOW PUMP STATION TO BE REPLACED BY AGI-PS-2, WHICH WILL PUMP WATER FROM THE EXISTING ODA 14B PERIMETER DITCH TO AGI R11 (ODA 13).

2G. OFFSITE OUTFALL STRUCTURES OOS-1 THROUGH OOS-3, AND OOS-8 WILL EACH DISCHARGE TO CNL-1.

3. OFFSITE OUTFALL STRUCTURES OOS-4 THROUGH OOS-7, WILL EACH DISCHARGE TO CNL-1. DURING THE PED PHASE, THE DESIGN OF THESE OFFSITE OUTFALL STRUCTURES IS TO BE APPROVED IN WRITING BY THE LANDOWNER OF THE PROPERTY TO BE SERVED BY EACH PROPOSED STRUCTURE, AND THE REQUIRED SFWMD ERP OR ERP MODIFICATION OBTAINED FOR EACH OF THESE PROPOSED STRUCTURES.

4. THE OFFSITE DRAINAGE COLLECTION DITCH (ODCD-1) WILL BE CONSTRUCTED WITHIN THE PROJECT LIMITS OF CONSTRUCTION ON THE SOUTH SIDE OF ODA 7A. ODCD-1 WILL COLLECT RUNOFF FROM ODA 7A FOR ULTIMATE DISCHARGE TO C-41A.

5. RUNOFF FROM THE NORTHEN PART OF ODA 7A WILL DRAIN NORTHWARD TO THE PERIMETER MAINTENANCE RD. ALONG THE NORTH SIDE OF ODA 7A; THEREFORE, TO ENSURE THAT ODA 7A DRAINS PROPERLY, THE PROJECT INCLUDES INSTALLATION OF CROSS-DRAIN CULVERTS UNDER THIS PORTION OF THE PERIMETER MAINTENANCE RD, WHICH WILL DISCHARGE TO CNL-1 REACH 7. SIZE AND SPACING OF THESE CROSS-DRAIN CULVERTS TO BE DETERMINED DURING THE PED PHASE.

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LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
OVERALL SITE PLAN FOR RECOMMENDED PLAN WITH FEMA FIRM FLOODPLAINS

DRAWING PREPARED BY J-TECH 12/19/2023

NORTH
0
3,000'
6,000'
EXIST. S-67 (TO REMAIN)
ISTOKPOGA CANAL
LAKE ISTOKPOGA
CR 621
EXIST. S-68 & S-68X (TO REMAIN)
EXIST. AGI R1 (TO REMAIN)
EXIST. AGI R6 (TO REMAIN)
EXIST. AGI R5 (TO REMAIN)
EXIST. AGI R7 (TO REMAIN)
EXIST. AGI R4 (TO REMAIN)
EXIST. AGI R3A (TO REMAIN)
EXIST. AGI R3B (TO REMAIN)
EXIST. AGI R11 (TO REMAIN)
US HWY 98
CSX RAILROAD
KISSIMMEE RIVER
ODA 11A
ODA 14A
ODA 12
ODA 10
ODA 8
ODA 3
ODA 14B
ODA 13
ODA 1
ODA 2
ODA 9
ODA 11B
ODA 7B
ODA 7A
ODA 4
ODA 5
ODA 6
POTENTIAL SITE FOR AGI-1
EXIST. BASINGER TRACT PROPERTY BOUNDARY (TO REMAIN)
UNDERHILL RD
BUTLERS BLUFF RD
LARSON DAIRY RD
EXIST. S-65D & S-65DX2 (TO REMAIN)
EXIST. S-65DX1 (TO REMAIN)
C-41A
RESERVOIR SITE LIMITS OF CONSTRUCTION
PERIMETER CANAL (CNL-1) C/L
PERIMETER DAM C/L
CNL-1 REACH 1B TYP. D.S.C.E. 33.3 TYP. W.S.C.E. 34.0
CNL-1 REACH 2A TYP. D.S.C.E. 35.2 TYP. W.S.C.E. 35.5
CNL-1 REACH 2B TYP. D.S.C.E. 37.6 TYP. W.S.C.E. 38.5
CNL-1 REACH 3A TYP. D.S.C.E. 38.7 TYP. W.S.C.E. 39.1
CNL-1 REACH 3B TYP. D.S.C.E. 36.3 TYP. W.S.C.E. 37.1
CNL-1 REACH 4 TYP. D.S.C.E. 33.7 TYP. W.S.C.E. 34.9
CNL-1 REACH 5 TYP. D.S.C.E. 32.6 TYP. W.S.C.E. 33.8
CNL-1 REACH 6 TYP. D.S.C.E. 30.8 TYP. W.S.C.E. 31.4
CNL-1 REACH 1A TYP. D.S.C.E. 30.2 TYP. W.S.C.E. 31.0
CNL-1 REACH 7 TYP. D.S.C.E. 24.0 TYP. W.S.C.E. 24.0
CNL-1 REACH 7
LOCAR WEST CELL NFSL = 51.7
LOCAR EAST CELL NFSL = 51.7
BORROW AREA (TYP)
EXIST. S-82 (TO REMAIN)
EXIST. S-83 & S-83X (TO REMAIN) Normal HW Operating Range: 30.6 - 31.0
CR 721
C-38
WOERNER SOUTH WETLAND RESTORATION PROJECT
TEMP. CONSTRUCTION OFFICE & STAGING AREA
SR 70
EXIST. S-65E & S-65EX1 (TO REMAIN) Normal HW Operating Range: 19.6 - 20.0
EXIST. S-65EW (TO REMAIN)
C-41
BRIGHTON VALLEY IMPOUNDMENT
SW RUCKS DAIRY RD

LEGEND

EXISTING WATER MANAGEMENT FEATURES

- OFFSITE DRAINAGE AREA (ODA) BOUNDARY
- ABOVE GROUND IMPOUNDMENT (AGI) AND/OR ODA BOUNDARY
- ODA TO DRAIN DIRECTLY/INDIRECTLY TO CNL-1 OR ODCD-1
- EXISTING PUMP STATION WITH FLOW DIRECTION ARROW
- EXISTING CONTROL STRUCTURE WITH FLOW DIRECTION ARROW
- EXISTING C-41A CANAL PROJECT CULVERT

LOCAR PROPOSED WATER MANAGEMENT FEATURES

- ABOVE GROUND IMPOUNDMENT AGI-1 (ODA 9) PROPOSED LIMITS OF CONSTRUCTION
- FIXED WEIR OUTFALL/OVERFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PERIMETER CANAL ADJUSTABLE WEIR STRUCTURE WITH FLOW DIRECTION ARROW
- UNGATED OVERFLOW SPILLWAY WITH FLOW DIRECTION ARROW
- UNGATED CULVERT WITH FLOW DIRECTION ARROWS
- GATED BI-DIRECTIONAL FLOW CONTROL STRUCTURE WITH FLOW DIRECTION ARROWS
- GATED OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PUMP STATION WITH FLOW DIRECTION ARROW

NOTES:

1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). FEET NGVD29 = FEET NAVD88 + 1.2 FEET.

2. FEMA FLOOD INSURANCE RATE MAP (FIRM) IMAGERY SHOWN HEREON IS FROM A COLLECTION OF FEMA FIRMs FOR HIGHLANDS COUNTY, FLORIDA AND INCORPORATED AREAS, EACH WITH AN EFFECTIVE DATE OF 11/18/2015, OBTAINED FROM FEMA'S FLOOD MAP SERVICE CENTER WEBSITE (https://msc.fema.gov/portal/home).

3. ALL FEMA SPECIAL FLOOD HAZARD AREAS SHOWN HEREON ARE ZONE A (SHOWN AS DOT PATTERN HATCHED AREAS). BASE FLOOD ELEVATIONS ARE UNDETERMINED BY FEMA FOR ZONE A.

4. AS SHOWN HEREON, THE LOCAR PROJECT FEATURES ARE LOCATED EITHER ENTIRELY ARE PARTIALLY WITHIN FEMA SPECIAL SPECIAL FLOOD HAZARD AREAS, WHICH REPRESENT THE 100-YEAR FLOODPLAIN (A.K.A. 1-PERCENT CHANCE-FLOODPLAIN OR BASE FLOODPLAIN) DETERMINED BY FEMA.

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LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
SECTION LOCATION PLAN FOR RECOMMENDED PLAN

DRAWING PREPARED BY J-TECH 12/19/2023

NOTES:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). FEET NGVD29 = FEET NAVD88 + 1.2 FEET.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)
SECTION 203 FEASIBILITY STUDY REPORT
RESERVOIR WEST INFLOW–OUTFLOW CANAL (CNL–3)
SITE PLAN FOR RECOMMENDED PLAN

DRAWING PREPARED BY J–TECH 2/8/2024

NORTH
150 0 150 300 600
(IN FEET)
1 inch = 150 ft.
INSTALL FENCE POST AND CONNECT 5-STRAND BARBED WIRE FENCE TO EXISTING BARBED WIRE FENCE
EXISTING BARBED WIRE FENCE (TO REMAIN)
LIMITS OF CONSTRUCTION
LIMITS OF RIPRAP CHANNEL LINING (TYP)
EXIST. DITCH
LEVEE
245'
345'
100'
610'
265'
R500'
R1000'
OFFSITE DRAINAGE COLLECTION DITCH (ODCD-2)
PROPOSED R-O-W LINE FOR CNL-3
5-STRAND BARBED WIRE FENCE
RESERVOIR WEST INFLOW-OUTFLOW CANAL (CNL-3)
1,500 CFS UNGATED CULVERT (2) 10'Wx12'T BOX CULVERTS (CU-3)
EXISTING GATED SPILLWAY S-83 (TO REMAIN)
EXISTING PROJECT CULVERT 21N (TO REMAIN)
LIMITS OF CONSTRUCTION
EXISTING GATED SPILLWAY S-83X (TO REMAIN)
PROPERTY LINE / LIMITS OF CONSTRUCTION
RESERVOIR PERIMETER FENCE ALONG PROPERTY LINE (5-STRAND BARBED WIRE)
RESERVOIR PERIMETER MAINTENANCE ROAD
OFFSITE OVERFLOW STRUCT. (OOS-7)
ACCESS GATE WITH LOCK (LIVESTOCK STEEL SWING GATE)
RESERVOIR PERIMETER CANAL (CU-1) REACH 1A
RESERVOIR TOE ROAD
CU-1 REACH 7
RETAINING WALL (TYP)
1,500 CFS GATED INFLOW/OUTFLOW CULVERT (2) 14'Wx10'T BOX CULVERTS W/ SLIDE GATES (CU-2)
RESERVOIR PERIMETER CANAL WEIR (PCW-1)
RESERVOIR PERIMETER CANAL OVERFLOW STRUCT. (PCOS-4)
INSTALL FENCE POST AND CONNECT 5-STRAND BARBED WIRE FENCE TO EXISTING BARBED WIRE FENCE
EXISTING PROJECT CULVERT 20N (TO REMAIN)
EXISTING BARBED WIRE FENCE (TO REMAIN)
SPOIL AREA NORTH EASEMENT LINE
C-41A R-O-W LINE
C-41A CANAL ℄
C-41A LEVEE
90'
185'
SPOIL AREA SOUTH EASEMENT LINE

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 1

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 2

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

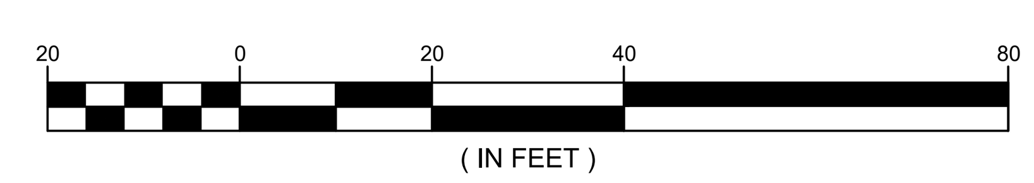
NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

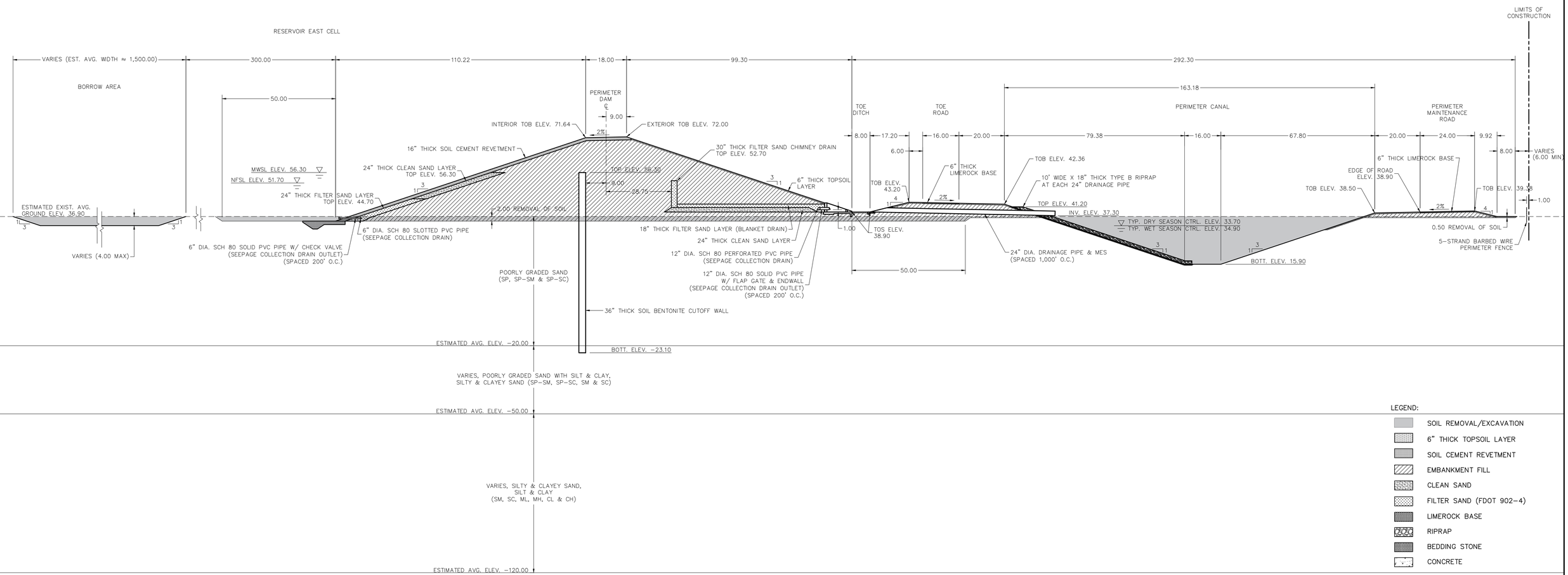
TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 3



LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.



LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 4

20 0 20 40 80

(IN FEET)

1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 5

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 6

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LEGEND:

- SOIL REMOVAL/EXCAVATION
- 6" THICK TOPSOIL LAYER
- SOIL CEMENT REVETMENT
- EMBANKMENT FILL
- CLEAN SAND
- FILTER SAND (FDOT 902-4)
- LIMEROCK BASE
- RIPRAP
- BEDDING STONE
- CONCRETE

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR PERIMETER DAM - REACH 7

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
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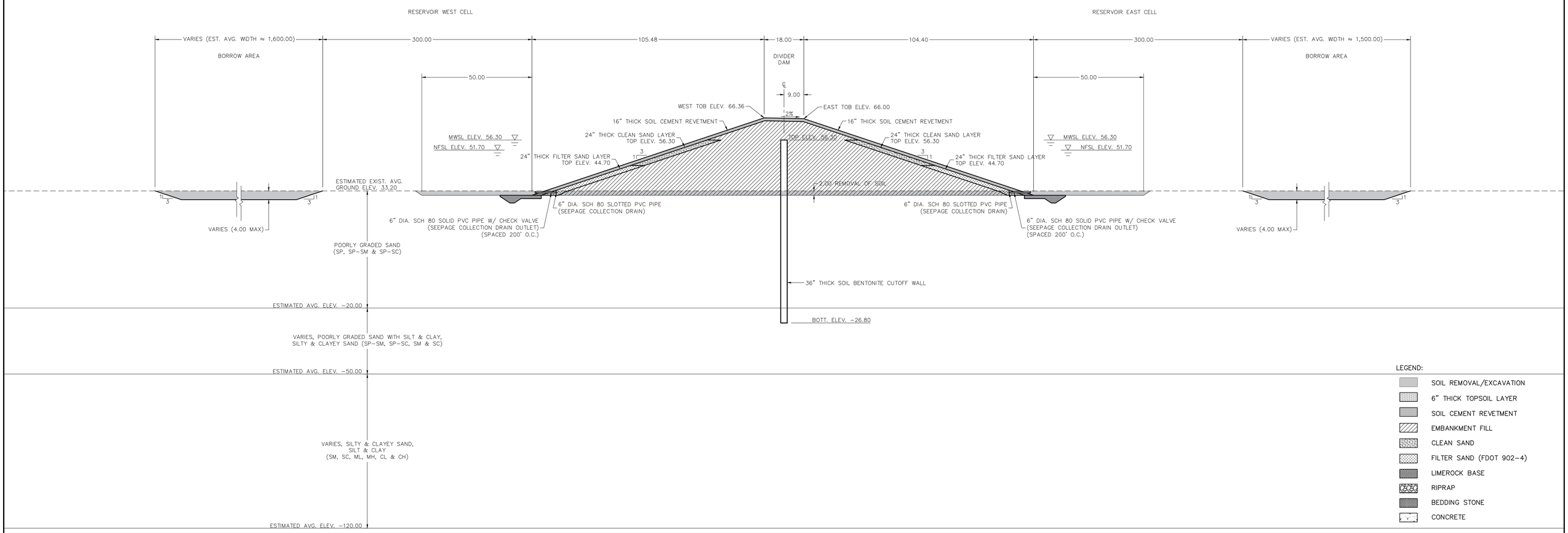
LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023



LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR DIVIDER DAM

20 0 20 40 80

(IN FEET)

1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR EAST INFLOW-OUTFLOW CANAL (CNL-2)

(IN FEET)
1 inch = 20 ft.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
11/15/2023

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - RESERVOIR WEST INFLOW-OUTFLOW CANAL (CNL-3)

LEGEND:

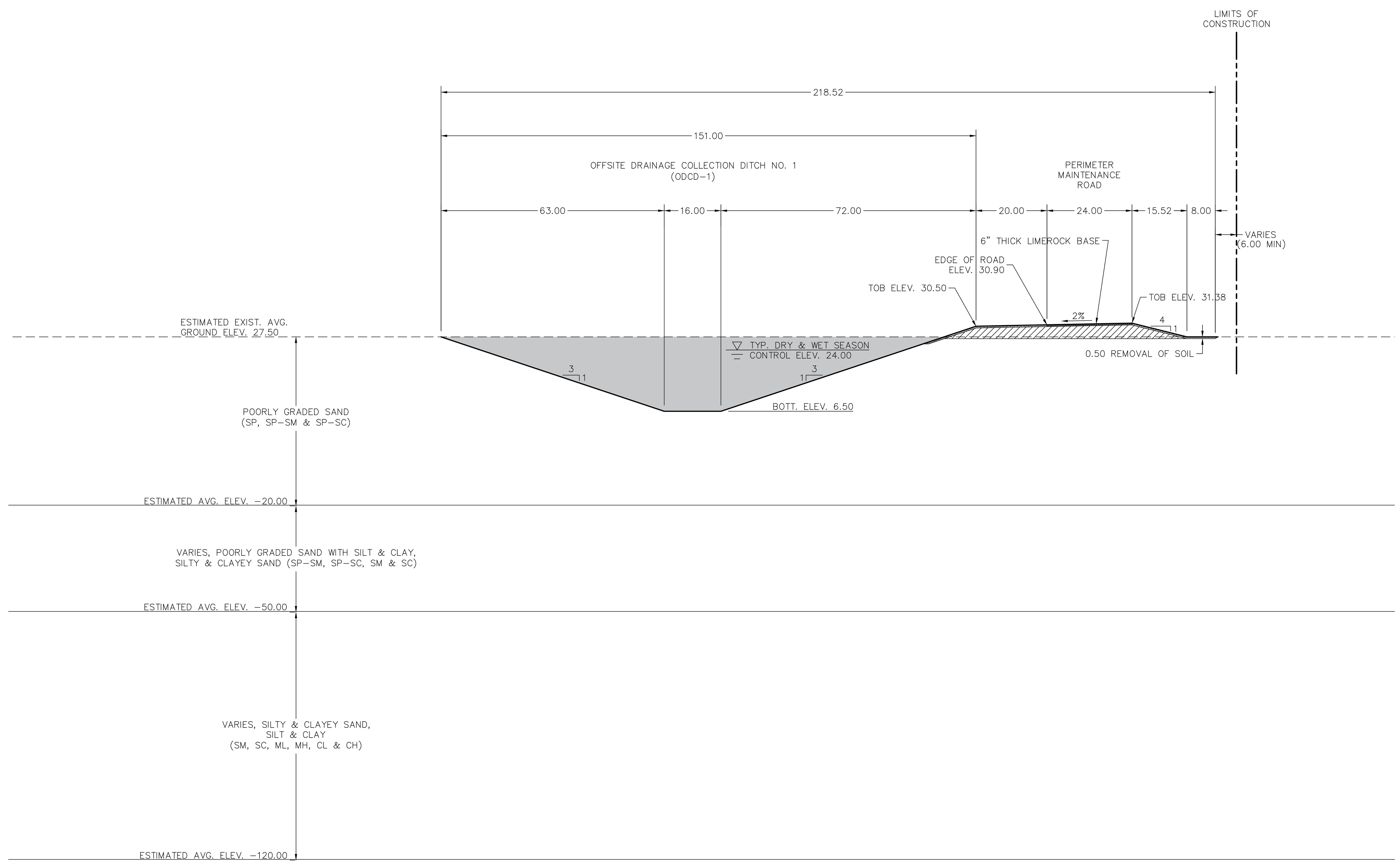
- SOIL REMOVAL/EXCAVATION
- 6" THICK TOPSOIL LAYER
- SOIL CEMENT REVETMENT
- EMBANKMENT FILL
- CLEAN SAND
- FILTER SAND (FDOT 902-4)
- LIMEROCK BASE
- RIPRAP
- BEDDING STONE
- CONCRETE

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
11/15/2023

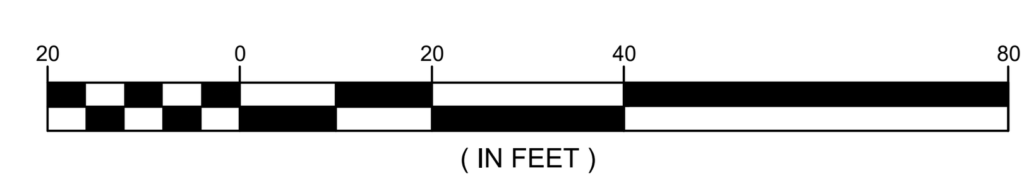


LEGEND:

- SOIL REMOVAL/EXCAVATION
- 6" THICK TOPSOIL LAYER
- SOIL CEMENT REVETMENT
- EMBANKMENT FILL
- CLEAN SAND
- FILTER SAND (FDOT 902-4)
- LIMEROCK BASE
- RIPRAP
- BEDDING STONE
- CONCRETE

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - OFFSITE DRAINAGE COLLECTION DITCH NO. 1 (ODCD-1)



NOTE:
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LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

TYPICAL SECTION - AGI LEVEE

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
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LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
11/15/2023

NORTH

LOCAR
EAST CELL

50 0 50 100 200

(IN FEET)
1 inch = 50 ft.

C-41A R/W

C-41A LEVEE

C-41A R/W

C-41A LEVEE

SECTION - S-84+

S-84+ GATED SPILLWAY
STRUCTURE 3-GATES

C-41A CANAL

SECTION - PS-1

PS-1 PUMP STATION
STRUCTURE 1,500 CFS

375 CFS ELECTRIC PUMP
WITH FSI (TYP OF 4)

C-41A CANAL

C-41A LEVEE

C-41A LEVEE

C-41A R/W

C-41A R/W

LOCAR RECOMMENDED PLAN

SITE PLAN - PS-1 PUMP STATION AND S-84+ GATED SPILLWAY STRUCTURE

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
LOCAR PUMP STA PS-2.DWG
9/24/2023

LOCAR RECOMMENDED PLAN

SECTION - PS-1 PUMP STATION

10 0 10 20 40
(IN FEET)
1 inch = 10 ft.

NOTE:
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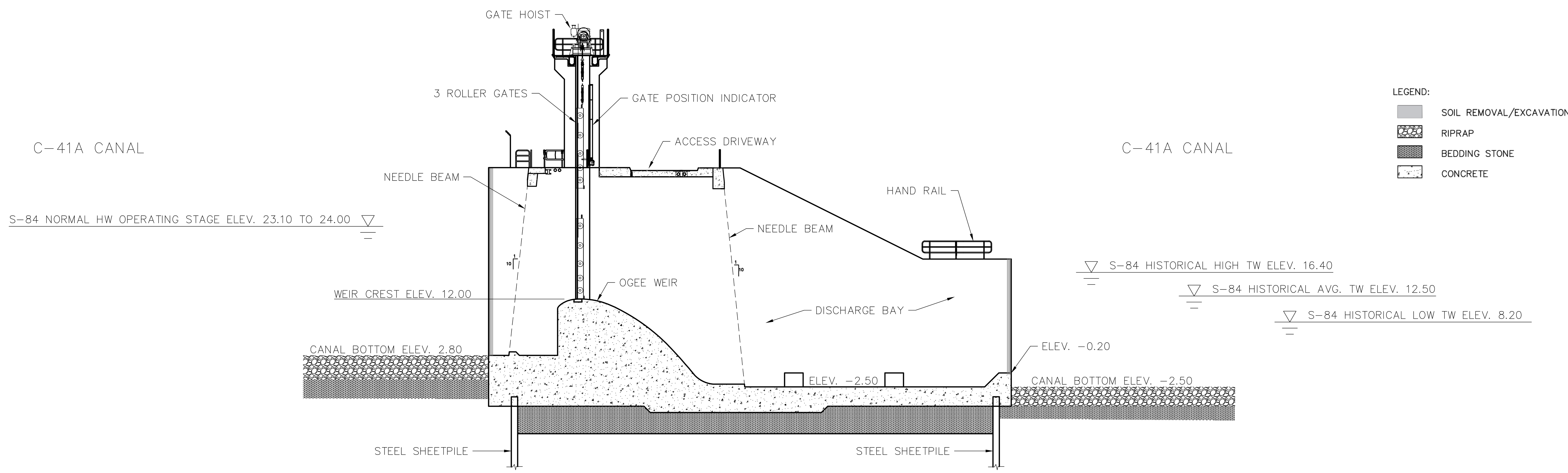
LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
9/24/2023



LOCAR RECOMMENDED PLAN

SECTION - S-84+ GATED SPILLWAY

10 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
9/24/2023


SPOIL AREA SOUTH EASEMENT LINE
C-41A R/W
C-41A LEVEE
C-41A CANAL ℄
C-41A LEVEE
C-41A R/W
SPOIL AREA NORTH EASEMENT LINE
65'
190'
190'
75'
PERIMETER MAINT. ROAD
24" THICK TYPE B RIPRAP
PERIMETER CANAL (CNL-1)
TOE ROAD
TOE DITCH
RESERVOIR PERIMETER DAM
NORTH
50
0
50
100
200
(IN FEET)
1 inch = 50 ft.
1,500 CFS GATED OUTFLOW CULVERT
(2) 14'Wx10'T BOX CULVERTS W/ SLIDE GATES
(CU-1A)
SECTION - CU-1A
RETAINING WALL
(ALL SIDES OF RIPRAP)
1,500 CFS OUTFLOW WEIR & CULVERT
(2) 14'Wx10'T BOX CULVERTS
W/ ADJUSTABLE WEIR
(CU-1B)
50 CFS ELECTRIC PUMP
WITH FSI (TYP OF 3)
36" DISCHARGE PIPE
(TYP OF 3)
RETAINING WALL
(TYP)
SECTION - SPS-1
BRIDGE (BR-1)
RETAINING
WALLS (TYP)
EXTERIOR OF 100 CFS RES. SEEPAGE PUMP STA. BLDG. (SPS-1)
(2) 50 CFS SEEPAGE PUMPS
(1) 50 CFS AUXILLARY SEEPAGE PUMP
PILOT DITCH
375 CFS ELECTRIC PUMP WITH FSI
(TYP OF 4)
78" DISCHARGE PIPE
(TYP OF 4)
RESERVOIR
INFLOW-OUTFLOW CANAL
(CNL-2)
FDOT TYPE E DITCH BOTTOM INLET
PILOT DITCH
EXTERIOR OF 1,500 CFS
RES. INFLOW PUMP STA. BLDG. (PS-2)
(4) 375 CFS INFLOW PUMPS
SECTION - PS-2
30" THICK
TYPE C RIPRAP
SAXOPHONE DISSIPATOR
(TYP OF 7)
10'Wx10'T CONC. BOX CULVERT
TYP. SECTION CNL-2
RETAINING WALL
(ALL SIDES OF RIPRAP)
UNGATED OVERFLOW
SPILLWAY (OS-1)
SECTION - OS-1
LOCAR
EAST CELL
PERIMETER CANAL OVERFLOW STRUCT.
(3) 14'Wx10'T BOX CULVERTS
W/ FIXED WEIR (CREST EL. = 25.5)
(PCOS-1)
24" THICK
TYPE B RIPRAP
C-41A LEVEE
C-41A LEVEE
PERIMETER MAINT. ROAD
PERIMETER CANAL (CNL-1)
24" THICK TYPE B RIPRAP
TOE ROAD
TOE DITCH
RESERVOIR PERIMETER DAM

LOCAR RECOMMENDED PLAN

SITE PLAN - PS-2 RESERVOIR INFLOW PUMP STATION AND ADJACENT STRUCTURES

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
LOCAR PUMP STA PS-2.DWG
2/8/2024

LOCAR RECOMMENDED PLAN

SECTION - CU-1A GATED OUTFLOW CULVERT

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/21/2023

LOCAR RECOMMENDED PLAN

SECTION - OS-1 UNGATED OVERFLOW SPILLWAY

SECTION - OS-2 UNGATED OVERFLOW SPILLWAY

20 0 20 40 80

(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/13/2023

LOCAR RECOMMENDED PLAN

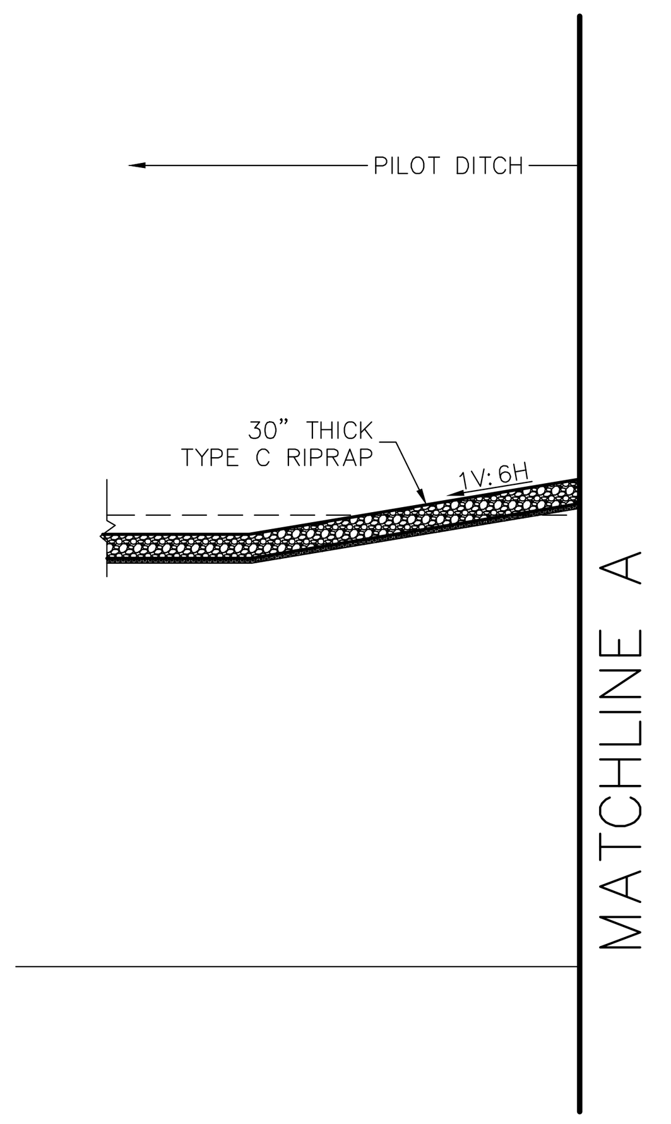
SECTION - PS-2 PUMP STATION

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
1/18/2024



LOCAR RECOMMENDED PLAN

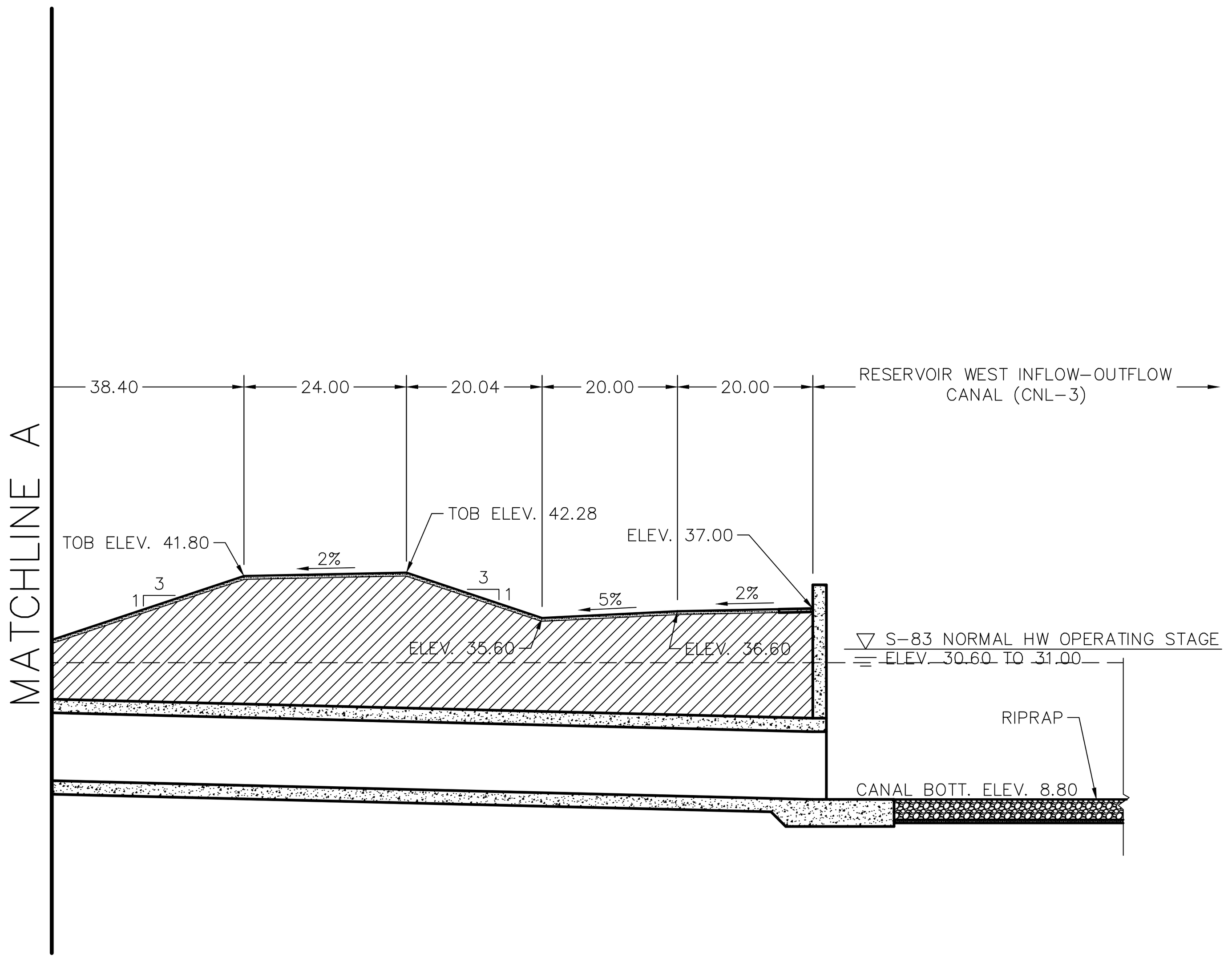
SECTION - SPS-1 SEEPAGE PUMP STATION

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
1/19/2024



LEGEND:

- SOIL REMOVAL/EXCAVATION
- 6" THICK TOPSOIL LAYER
- SOIL CEMENT REVETMENT
- EMBANKMENT FILL
- CLEAN SAND
- FILTER SAND (FDOT 902-4)
- LIMEROCK BASE
- RIPRAP
- BEDDING STONE
- CONCRETE

20 0 20 40 80
(IN FEET)
1 inch = 20 ft.

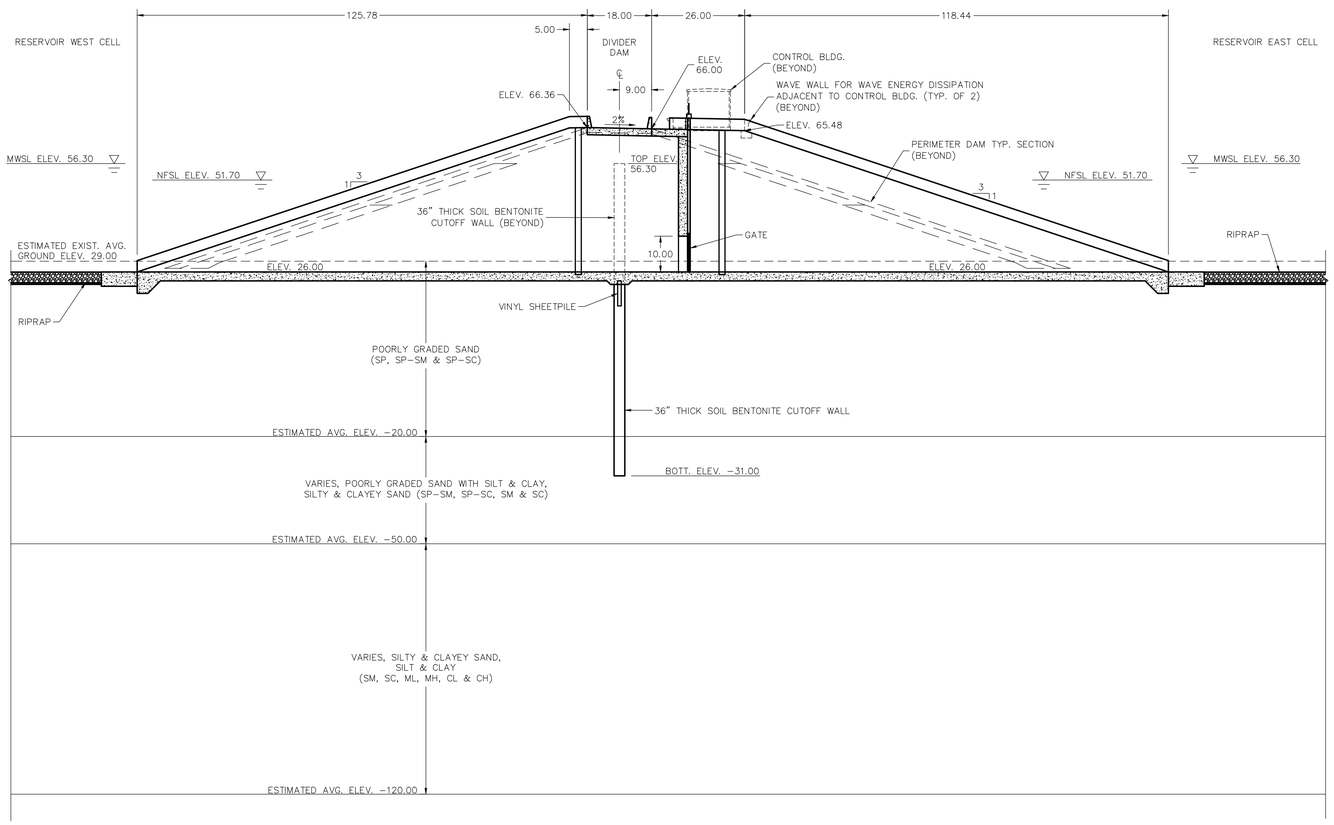
LOCAR RECOMMENDED PLAN

SECTION - CU-2 GATED OUTFLOW CULVERT

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/21/2023



LEGEND:

- SOIL REMOVAL/EXCAVATION
- 6" THICK TOPSOIL LAYER
- SOIL CEMENT REVETMENT
- EMBANKMENT FILL
- CLEAN SAND
- FILTER SAND (FDOT 902-4)
- LIMEROCK BASE
- RIPRAP
- BEDDING STONE
- CONCRETE

LOCAR RECOMMENDED PLAN

SECTION - DDS-1 DIVIDER DAM STRUCTURE

20 0 20 40 80

(IN FEET)

1 inch = 20 ft.

NOTE:
1. ELEVATIONS SHOWN HEREON ARE EXPRESSED IN FEET AND ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). NGVD29 = NAVD88 + 1.2 FEET FOR THE LOCAR PROJECT LIMITS OF CONSTRUCTION.

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

DRAWING PREPARED BY J-TECH
TYPICAL SECTION SHEET LAYOUTS.DWG
12/21/2023

ANNEX C-2

Documentation for Florida Gas Transmission Company Permanent Easement

201001

IN THE TENTH JUDICIAL CIRCUIT COURT
IN AND FOR HIGHLANDS COUNTY, FLORIDA

COPY

FLORIDA GAS TRANSMISSION COMPANY, LLC, a Delaware limited liability company,

Petitioner,

v.

LYKES BROS., INC., a Florida corporation; **UNITED STATES SUGAR CORPORTATION**, a Delaware corporation; **SOUTH FLORIDA WATER MANAGEMENT DISTRICT** f/k/a Central and Southern Florida Flood Control District as successor to Everglades Drainage District; **GLADES ELECTRIC COOPERATIVE, INC.**, a Florida non-profit corporation; **EMBARQ FLORIDA, INC.**, a Florida corporation f/k/a United Telephone Company of Florida; **VERENIUM BIOFUELS CORPORATION**, a Delaware corporation; **STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION**; **CHARLES L. BRYAN,** as Tax Collector, and the unknown spouses of the above, if any, and their heirs, devisees, assignees, grantees, creditors, lessees, executors, administrators, mortgagees, judgment creditors, trustees, lienholders, persons in possession, and any and all other persons having or claiming to have any right, title or interest by, through, under or against the above-named defendants, or otherwise claiming any right, title, or interest in the real property described in this action,

Defendants.

CASE NO.: GC-10-111

PARCEL(S): FL-HIGH-099/
FL-HIGH-100/
FL-HIGH-102/
FL-HIGH-103/
FL-HIGH-111/
FL-HIGH-112/
FL-HIGH-113/
FL-HIGH-115
FL-HIGH-117
FL-HIGH-119

March 2, 2010

STIPULATED ORDER OF TAKING AND FINAL JUDGMENT AS TO PARCELS FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119WITH DISBURSEMENT ORDERS TO CLERK

THIS CAUSE came before the Court upon the Joint Motion for Entry of Stipulated Order of Taking And Final Judgment as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 With Disbursement Orders to Clerk ("Joint Motion") filed by

Petitioner, FLORIDA GAS TRANSMISSION COMPANY, LLC ("FLORIDA GAS"), and Defendant, LYKES BROS. INC ("LYKES"). The Court having reviewed the record and it appearing that the parties hereto were authorized to enter into the Joint Motion and that the papers filed herein by Petitioner are in proper and sufficient form, and the Court finding that the compensation to be paid by Petitioner is full, just and reasonable for all parties concerned, and being otherwise fully advised in the premises, it is hereby

ORDERED and **ADJUDGED** that:

1. All parties have been properly served with process or otherwise have submitted themselves to this Court's jurisdiction. The Court has jurisdiction over the parties and the subject matter of this cause pursuant to Florida Statutes, Chapters 73, 74, 180 and 361.

2. The property interests being appropriated by Petitioner, designated as Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119, are described in Schedule I attached hereto and incorporated herein by reference.

3. The pleadings in this cause are sufficient, Petitioner is properly exercising its delegated authority, and the condemnation of Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 is for a valid public purpose and is necessary for such purpose as is set forth in the Petition filed in this cause.

4. LYKES waives any and all objections to the reasonable necessity of Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 for the public purpose set forth in the Petition, and waives any objection to the good faith estimate of value as set forth in the Declaration of Taking. LYKES further stipulates to the entry of this order of taking and final judgment as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119.

5. All other conditions precedent to Petitioner's requested relief have been performed, have occurred or have been waived.

6. Defendant, CHARLES L. BRYAN, as Tax Collector, has appeared in this action and may have a claim to the proceeds to be paid for Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 for unpaid pro-rated ad valorem taxes assessed against Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 through the date title vests in Petitioner, but said defendant has not requested a hearing pursuant to Section 74.051(1) of the Florida Statutes.

7. Defendants, SOUTH FLORIDA WATER MANAGEMENT DISTRICT and STATE OF FLORIDA, DEPARTMENT OF TRANSPORTION, have amicably settled all respective interests to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 and have been voluntarily dropped from this action.

8. Defendants, UNITED STATES SUGAR CORPORATION, GLADES ELECTRIC COOPERATIVE, INC., VERENIUM BIOFUELS CORPORATION, have failed to appear in this action. Service of process has been perfected on all aforementioned Defendants and pursuant to Fla. Stat. §73.051(1), clerk's defaults have been prepared and will be entered simultaneously with this Order.

9. Based upon the foregoing, it is proper that this order of taking and final judgment as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 should enter in favor of FLORIDA GAS and against the owners listed in the Petition In Eminent Domain as their interests may appear.

10. The Joint Motion is **GRANTED** and is incorporated by reference into this order and judgment.

11. This Order of Taking and Final Judgment shall become effective only upon Petitioner's deposit of the required sum as set forth below into the registry of this Court within twenty (20) days after the date of this order and judgment.

12. Upon Petitioner's deposit of the monies herein ordered to be deposited, as evidenced by the Clerk's certificate of deposit, Petitioner shall be vested with the permanent easements, and temporary construction easements and extra temporary construction easements, collectively designated as Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 and described herein without further notice or order of this Court, and Petitioner shall be entitled to immediate possession of such property interests, which property interests shall be deemed to have been condemned and taken for the uses as set forth in the Petition in Eminent Domain and in Schedule I attached hereto.

13. LYKES shall have and recover from Petitioner the sum of **ONE MILLION SEVEN HUNDRED THOUSAND and NO/100 Dollars ($1,700,000.00),** in full compensation for the property interests taken, improvements taken, severance damages, cure costs, and all other damages now and in the future arising from the taking of Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 in this cause, and the payment of any unpaid pro-rated ad valorem taxes assessed against Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 through the date of taking, but exclusive of costs and attorney's fees. As a result, within twenty (20) days after the date of this order, Petitioner shall deposit into the registry of this Court the aforementioned sum of **ONE MILLION SEVEN HUNDRED THOUSAND and NO/100 Dollars ($1,700,000.00),** which total sum shall only satisfy the claims of Lykes, notwithstanding any language in Schedule I to the contrary.

14. Pursuant to the aforementioned joint motion, LYKES and its counsel agree that no nonmonetary benefits have been achieved in this cause and thereby have waived any additional claim for attorney's fees or costs against Petitioner in this cause as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119. Such stipulation is hereby ratified and incorporated into this order and judgment. Consequently, the sum of **THREE HUNDRED EIGHT THOUSAND SIX HUNDRED EIGHTY EIGHT AND 61/100 Dollars ($308,688.61)** is hereby taxed against Petitioner as and for all reasonable costs expended or incurred in this cause by or on behalf of LYKES, including attorney's fees and appraisal services.

15. Without further order of this Court, upon Petitioner's deposit the Clerk of this Court shall forthwith pay to LYKES, the *total* sum of **TWO MILLION EIGHT THOUSAND SIX HUNDRED EIGHTY EIGHT AND 61/100 Dollars ($2,008,688.41),** subject to the provisions of paragraph 11 above, and less any unpaid pro-rated ad valorem taxes assessed against Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 through the date of taking. Immediately upon issue, the Clerk shall mail its check to **Trust Account of FOWLER WHITE BOGGS P.A., c/o Fred Werdine, Esq., P.O. Box 1438, Tampa, Florida 33601** as counsel for LYKES for disbursement.

16. Florida Gas shall provide to the appropriate contractors a document substantially similar to the Special Construction Conditions list attached hereto as Schedule II, provided that nothing contained in Schedule II shall be construed to modify, enlarge, or create any obligation of Florida Gas that is different than or in addition to the terms of Schedule I.

17. There are no other or further compensation, attorneys' fees or costs due from Petitioner to LYKES in this matter as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119.

18. The Court retains jurisdiction for determination of unpaid taxes and for enforcement of the terms of this order and judgment as may be necessary.

~~DONE and~~ **ORDERED** in chambers at Sebring, Highlands County, Florida on this 2 day of March, 2010.

/s/ OLIN W. SHINHOLSER

Circuit Judge

JOINT MOTION FOR ENTRY OF STIPULATED ORDER OF TAKING AND FINAL JUDGMENT AS TO PARCELS FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 WITH DISBURSEMENT ORDERS TO CLERK

Petitioner, **FLORIDA GAS TRANSMISSION COMPANY, LLC** and Defendants, LYKES BROS. INC., by and through their undersigned counsel, hereby stipulate and jointly move that the Court enter the foregoing Stipulated Order of Taking and Final Judgment as to Parcels FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119 With Disbursement Orders to Clerk.

I. ED PANTALEON
Florida Bar Number 0603546
HAROLD E MORLAN III
Florida Bar Number
BRENDAN T. FRANZONI
Florida Bar Number :0071820
Bricklemyer Smolker & Bolves, PA
500 E. Kennedy Blvd., Suite 200
Tampa, Florida 33602
(813) 223-3888
Attorneys for Petitioner,
FLORIDA GAS TRANSMISSION CO.

FRED WERDINE
Florida Bar Number 0614483
Fowler White Boggs P.A.
P.O. Box 1438
Tampa, FL 33601
(813) 228-7411
Attorney for Defendant
LYKES BROS, INC.

Copies furnished to:
I. Ed Pantaleon, Esquire
Harold E. Morlan, III, Esquire
Brendan T. Franzoni, Esquire
Fred Werdine, Esquire
Clerk's Accounting Department

Schedule I to
ORDER OF TAKING AND FINAL JUDGEMENT

NATURAL GAS PIPELINE EASEMENT AGREEMENT

TRACT NOS: FL-HIGH-099/100/102/103/111/112/113/115, FL-HIGH-117 AND FL-HIGH-119

The Undersigned, Lykes Bros. Inc., a Florida Corporation, ("Grantor," whether one or more), being the owner(s) of, or having an interest in, that certain tract of land situated in Highlands County, Florida and more particularly described in Exhibit "A" attached hereto ("Lands"), for and in consideration of the sum of Ten and No/100 Dollars ($10.00), the receipt and sufficiency of which Grantor hereby acknowledges, does hereby grant, convey, and warrant the permanent easement, the temporary construction easement, the extra temporary construction easement and access roads herein conveyed to FLORIDA GAS TRANSMISSION COMPANY, LLC, a Delaware limited liability company ("Grantee"), with its principal offices at 5444 Westheimer Road, Houston, Texas 77056, and to Grantee's successors and assigns, along with the non-exclusive (except that only Grantee may operate a natural gas pipeline system therein) and perpetual right, privilege and easement for and to construct, install, maintain, operate, inspect, patrol, test, repair, alter, substitute, relocate, resize, replace and remove (collectively, the "Pipeline Operations") a single underground transmission pipeline system for the transportation of natural gas, and appurtenances thereto (collectively, the "Pipeline Facilities"), under, across, within and through a part and strip of the Lands, as described on Exhibit "A-1" attached hereto ("Permanent Easement"), together with the right to utilize Grantee's existing easement or easements as well as such additional portions of the Lands identified and described on Exhibit "A-1" as temporary construction easements for workspace during the initial construction and installation of the Pipeline Facilities, except at road crossings, jurisdictional wetland crossings, tile crossings, river and stream crossings or areas with unusual construction problems where extra temporary construction easement(s) may be utilized (collectively the "Temporary Construction Easement"). Additionally, Grantee will mark the pipeline route will above-ground warning markers. The pipeline markers will be at such locations and distances as are necessary to provide a minimum line of sight between markers (maximum 500' spacing) as well as to indicate the entry and exit points of the pipeline on the Lands, and all points of intersection and crossings of property boundaries, waterbodies, railroad tracks and/or roads. Grantee may also place aerial inspection markers on the ground adjacent to the pipeline to facilitate aerial inspection of the pipeline route. To the extent possible and reasonable, all necessary or required cathodic test leads (including all A/C mitigation box(es)) and all vent pipes, if any, necessary for railroad and road crossings, will be placed near fence lines across the Permanent Easement or adjacent to road right-of-way lines on the Permanent Easement. In the event that engineering design or federal or state statutes, rules or regulations require that a valve or meter be located on the Lands, Grantor and Grantee will enter into a separate valve site or meter site agreement for the purpose of defining the rights and obligations of Grantor and Grantee with respect ot the location and operation of the valve or

meter. Except as provided above, Grantee shall cause no other above-ground appurtenances to be constructed on the Permanent Easement in connection with the Pipeline Operations of and for the Pipeline Facilities. Any above-ground appurtenance not expressly identified herein will only be placed on the Lands, upon the express mutual agreement of the parties.

TO HAVE AND TO HOLD unto Grantee, its successors and assigns, for the purpose of conducting the Pipeline Operations with respect to such Pipeline Facilities.

As further consideration for the payment made by Grantee hereunder, Grantor and Grantee further agree with respect to the Pipeline Facilities, the Permanent Easement and the Temporary Construction Easement that:

1. Exhibit "A" describes the Lands and Exhibit "A-1" describes the Permanent Easement, the Temporary Construction Easement and the access roads. Exhibit "A" and Exhibit "A-1" are attached hereto and by this reference are made a part hereof for all purposes.

2. Grantor represents to Grantee that [please initial in the space provided and complete as appropriate]:

__x___ The Lands are leased or rented to Verenium Biofuels Crop. for the period beginning June 06, 2008, , and ending Septebmer 30, 2031;

Or,

_____ The Lands are not leased, rented or occupied by any lessee or tenant.

3. Grantor does hereby fully warrant the title to the Lands and will defend the same against the lawful claims and demands of all persons whomsoever, including, without limitation, tenants on the Lands, whether identified above or not. Grantor shall receive payment hereunder in such proportion as the interest of Grantor bears to the full fee simple title to the Lands encumbered by the Permanent Easement and the Temporary Construction Easement.

4. Those portions of the Lands, if any, designated as access road(s) shall be limited solely to ingress and egress for movement of personnel, materials, supplies and equipment for the purposes enumerated herein.

5. If applicable, the Temporary Construction Easement rights acquired are the temporary right, privilege and easement for use as work space for movement, storage and staging of personnel, materials, supplies and equipment, ingress and egress, for the purpose of conducting Pipeline Operations to construct and install and initially maintain, operate, inspect, test, repair, patrol, alter, substitute, relocate, resize, replace and remove Grantee's Pipeline Facilities located on the Permanent Easement, or Grantor's other property encumbered by Grantee. However, those portions of the Lands, if any, designated as temporary access road(s) shall be limited solely to ingress and egress for movement of personnel, materials, supplies and equipment for such purposes enumerated herein.

6. Grantee shall have the right of ingress to and egress from the Permanent Easement and the Temporary Construction Easement (during the length of its term) by means of the Permanent Easement, the Temporary Construction Easement (during the length of its term), and adjacent public or private roadways, easements or rights-of-way owned, held or lawfully available to Grantee, including any other property over which Grantee has access rights, for the purposes of Pipeline Operations with respect to such Pipeline Facilities located, in whole or in part, on the Permanent Easement, the Temporary Construction Easement (during the length of its term) and performed at the will of the Grantee. Prior to the conduct of Pipeline Operations, Grantee will reconstruct all points of access from S.R. 70 to the Lands which are encumbered by a Temporary Access Easement in favor of Grantee. Grantee agrees to reconstruct such access points to FDOT standards which will adequately support the vehicles and equipment to be utilized during the construction and operation of the Pipeline Facilities. During the conduct of the Pipeline Operations, Grantee agrees to maintain access for the benefit of Grantor across the

Permanent Easement and Temporary Construction Easement (s) by means of the existing driveway(s) or by means of an earthen plug or ditch plate.

7. Grantee shall have use of the Temporary Construction Easement as work space for purposes of staging or storage of equipment, supplies or materials, and ingress and egress, and for the movement of personnel, supplies and equipment related to initial Pipeline Operations in connection with Grantee's Pipeline Facilities. The rights of Grantee with respect to the Temporary Construction Easement shall commence on January, 1, 2010 and shall terminate and expire upon the earlier of the passage of twenty-four (24) months after January 1, 2010 or the date on which Grantee completes the initial construction and installation of the Pipeline Facilities. At such time as the Temporary Construction Easement terminates and expires, Grantee shall, upon written request from Grantor, provide Grantor with a written release of the Temporary Construction Easement to be recorded in the public records of Highlands County, Florida.

8. Notwithstanding the termination and expiration of the Temporary Construction Easement for purposes of constructing and installing the Pipeline Facilities, as set forth in paragraph 7, above, if applicable, Grantee shall retain and Grantor hereby grants to Grantee, right of access and entry to only those portions of the Temporary Construction Easement, if any, determined to be, or identified as, jurisdictional wetlands solely for purposes of Grantee's mitigation, maintenance and monitoring activities conducted in satisfaction of Grantee's governmental permit(s) requirements. However, in any event, the Temporary Construction Easement automatically shall terminate and expire for all purposes and in all respects upon the passage of five (5) years after the latter of:

(a) December 31, 2011;

(b) the date on which Grantee completes the initial construction and installation of the Pipeline Facilities.

At such time as the Temporary Construction Easement terminates and expires, Grantee shall provide Grantor with a written release of the Temporary Construction Easement to be recorded in the public records of Highlands County, Florida.

9. Grantor retains the right and may continue to use the Permanent Easement and Temporary Construction Easement for any lawful purposes, including but not limited to, continued use as a driveway for ingress and egress to Grantor's remaining Lands, and agricultural purposes, that do not directly interfere with Grantee's rights acquired hereunder; provided, however, that Grantor shall not directly interfere with the exercise by Grantee of the rights hereby conveyed, including ingress to and egress from the Permanent Easement and Temporary Construction Easement (for as long as it shall exist), and the safe and efficient conduct of the Pipeline Operations relating to the Pipeline Facilities. Grantee agrees to provide Grantor, either upon Grantor's request or at Grantee's option, a prior written determination that any particular exercise of the right to use the Permanent Easement or Temporary Construction Easement by Grantor does not directly interfere with the safe and efficient exercise of Grantee's rights, which determination shall not be arbitrarily or unreasonably withheld or conditioned. For safety and for Grantee's operations purposes, the use of the surface and subsurface of the Permanent Easement and Temporary Construction Easement by Grantor shall be subject to the following terms, conditions and limitations:

a) installation and construction of any public or private utilities, including, but not limited to, water, sewer, gas electrical, fiber optic, and/or telephone within the Permanent Easement shall be subject to the following additional specific terms, conditions, and limitations: (1) all subsurface utilities which cross the Permanent Easement shall be installed perpendicular and not parallel to the Permanent Easement and no utility pipes or lines may be laid parallel to the pipeline pipe; and (2) construction and installation of all subsurface utility pipes or cables which cross the Permanent Easement shall be constructed and installed so as to maintain a separation depth of not less than eighteen inches (18") between such pipes and/or cables and Grantee's pipeline pipe.

b) installation and construction of any fences within the Permanent Easement, after the initial construction of the Pipeline Facilities, shall be subject to the following additional specific terms, conditions and limitations: (1) no fence posts for any fences crossing the Permanent Easement perpendicularly shall be installed closer

than five feet (5') on either side of Grantee's pipeline pipe; and (2) any fences running parallel to the Permanent Easement shall be installed no closer than five feet (5') from Grantee's pipeline pipe.

c) installation and construction of any parking areas and/or public or private roads or streets within the Permanent Easement shall be subject to the following specific additional terms, conditions and limitations: (1) all parking areas or roads or streets which are located on or across the Permanent Easement may be paved with asphalt or concrete; (2) all roads and streets shall be installed and constructed perpendicular and not parallel to the Permanent Easement; and (3) Grantee shall have the right to utilize any parking area, road or street installed on or across the Permanent Easement as a means of ingress to, and egress from, the Permanent Easement;

d) planting and installation of any trees and/or landscaping within the Permanent Easement, after the initial construction of the pipeline, shall be subject to the following specific additional terms, conditions and limitations: (1) any trees or shrubbery shall be shallow rooted; (2) no trees or shrubbery shall be planted any closer than five feet (5') on either side of any pipeline located on the Permanent Easement; and (3) any trees or shrubbery planted by Grantor and removed by Grantee shall be replaced by Grantee with new nursery trees or shrubbery of a size not greater than five (5) gallons;

e) Grantee shall have the right to remove the trees, landscaping, parking areas, roads, streets, fences and/or utilities during the Pipeline Operations without liability to Grantor or any third party for damages; however, Grantee, at the sole cost and expense of Grantee, shall restore such trees (subject to the limitations set forth above), shrubbery, parking areas, roads, street and/or utilities to their original condition, as near as is reasonably practicable and as is provided herein.

f) except as is otherwise provided herein, Grantor shall be responsible, at the sole costs and expense of Grantor, for the routine repair and maintenance of the parking areas, roads, streets, fences and/or subsurface utilities installed on or across the Permanent Easement and for the care and maintenance of the trees, shrubbery and other landscaping planted by Grantor on the Permanent Easement; and

g) operations by others on the Permanent Easement pursuant to the terms of this Natural Gas Pipeline Easement shall not impair or interfere with the rights granted to Grantee by this Natural Gas Pipeline Easement and shall not require the relocation or lowering of the pipeline, decrease the minimum cover for the pipeline provided in Paragraph 13 below.

Grantee's employees, contractors, and agents will follow Grantor's phytosanitary procedures, as well as those required by the State of Florida and/or federal law or regulation.

10. The consideration Grantee paid for the Permanent Easement and the Temporary Construction Easement in the amount set forth above, includes compensation for all timber, trees, landscaping, grasses, shrubbery, crops, improvements and Grantor's other property items which are compensable according to applicable Florida law (including but not necessarily limited to fences, roads, driveways, sidewalks, parking areas) that Grantee might remove from the Permanent Easement and the Temporary Construction Easement

11. Before initial construction of the Pipeline Facilities, Grantee shallrelocate or replace any drainage ditch and irrigation facilities, wells, septic tanks and septic drain fields located on the Permanent Easement and Temporary Construction Easement with the same, like or better quality at a different location on the Permanent Easement or Temporary Construction Easement or at such location on the Grantor's remaining Lands as agreed to by Grantor and Grantee.

12. Throughout the duration of the Temporary Construction Easement, and to the extent damage results from use by Grantee or its agents, Grantee will maintain and repair any pre-existing fences, roads, driveways, sidewalks, parking areas, drainage ditch and irrigation facilities, , wells, septic tanks and septic drain fields located on the Permanent Easement or

Temporary Construction Easement that were not removed, relocated or replaced prior to initial construction of the Pipeline Facilities, and Grantee will maintain and repair any new fences, roads, driveways, sidewalks, parking areas, irrigation systems, wells, septic tanks and septic drain fields that were relocated or replaced on the Permanent Easement or Temporary Construction Easement prior to initial construction of the Pipeline Facilities.

13. During construction, Grantee will bury the pipeline to provide a minimum cover of forty-eight inches (48"), which includes a minimum cover of forty-eight inches from the design depths of all Irrigation and Drainage Facilities on the Lands. As used herein, "Irrigation and Drainage Facilities" shall mean those areas where depressions in the land surface are used to convey or store water, but does not include pipes or utility lines. Such Irrigation and Drainage Facilities design depths will be made available to Grantee upon request. Grantor shall not reduce the post-construction depth of cover. Further, during construction, Grantee expressly agrees that Grantor can continue to operate and utilize the ditch and irrigation facilities on the Permanent Easement which are not under active construction. Grantee and Grantor will expressly agree on a schedule regarding which segments or portions of the drainage ditch and irrigation facilities must not be utilized during active construction. However, at no time can any one segment of drainage ditch and irrigation facilities be taken out of service by Grantee for a time greater than three (3) months.

14. Grantee may displace any gopher tortoises found within the Permanent Easement or the Temporary Construction Easement to another location on the Permanent Easement or Temporary Construction Easement, or off the Lands of Grantor (e.g., to a temporary holding pen), and returned as near to their original location on the Permanent Easement or Temporary Construction Easement as practicable after initial construction of the Pipeline Facilities is completed.

15. To the extent that Grantee may engage in excavation, Grantee shall remove from the Permanent Easement all three-inch (3") or greater diameter rock excavated from the trench across tillable portions of the Permanent Easement, in a manner reasonably satisfactory to Grantor when such rock cannot be replaced in the trench to a depth consistent with that of rock in adjacent lands unaffected by the construction of the Pipeline Facilities.

16. Subject to, and to the extent not inconsistent with, Grantee's rights under this Natural Gas Pipeline Easement, after initial construction of the Pipeline Facilities, Grantee shall, to the extent practicable, relocate or replace with the same, like or better quality and at their original locations or as near thereto as is reasonably practicable, all fences, roads, driveways, sidewalks, parking areas, drainage ditch and irrigation facilities, wells, septic tanks and septic drain fields, trees, landscaping, grasses, shrubbery, crops, improvements and Grantor's other property items which are compensable according to applicable Florida law, that Grantee damaged or caused to be removed, relocated or replaced from the Permanent Easement and Temporary Construction Easement before or during initial construction of the Pipeline Facilities and Grantee shall plant Argentine bahia grass seed or such other seed as the parties may agree to on all other land surfaces disturbed by the Pipeline Operations.17. Subject to Grantee's rights hereunder and to the extent not inconsistent therewith, Grantee will restore the surface of all disturbed areas within and outside of the boundaries of the Permanent Easement and Temporary Construction Easement to original contour and condition, as near as is reasonably practicable, to the extent the damage or disturbance of results from the Pipeline Operations, except for the surface beneath any above-ground Pipeline Facilities installed in the Permanent Easement. Grantee will also restore the surface of all disturbed areas of any existing or new access roads to its original contour and condition, as near as is reasonably practicable, to the extent utilized by Grantee and the damage or disturbance to which results from use by Grantee or its agents.

18. It is expressly provided that after initial construction and installation of the Pipeline Facilities, Grantee shall have the right, but not the obligation, (without liability for damages) from time to time to reclear the Permanent Easement by cutting and removing therefrom trees, brush and other obstructions that may, in the reasonable judgment of Grantee or pursuant to regulatory requirements, injure, endanger or interfere with Grantee's use of the Permanent Easement.

19. During the conduct of initial Pipeline Operations, Grantee shall erect, and shall bear the cost and expense of maintaining, a fence or other protective barrier, with gate(s) along the entire North side of the Permanent Easement and/or the Temporary Construction Easement (whichever boundary is most North) to properly enclose all cattle and other animals owned by Grantor on the Lands. Such fence shall be built and maintained to Grantor's specifications which include a five (5) strand barbed wire fence with four inch posts, every fifteen (15) feet, and sixteen (16) foot steel pipe gates.

20. Prior to commencement of the construction hereof or entering upon Grantor's Lands, Grantee shall obtain and provide and thereafter during the term of the Permanent Easement and keep in force and effect and pay all necessary premiums upon and furnish Certifications of Insurance evidencing the insurance described below: (1) Comprehensive General Liability-Bodily Injury and Property Damage up to $ $2,000,000 CSL Each Occurance; (2) Automobile Liability – Bodily Injury and Property Damage up to $ 1,000,000] CSL Each Occurance; (3) Worker's Compensation insurance as required by law, written by law, written by an insurance company authorized and qualified to write Workers' Compensation insurance in the State of Florida.; Employer's Liability Insurance in the amount of $200,000 each accident. Grantor shall be added as "additional insured" on all insurance policies required herein, with exception of the Workers' Compensation Insurance. Despite the foregoing, Grantee reserves the right to self-insure for up to the first $1,000,000 dollars of any liability coverage.

21. Grantee may assign its rights acquired under the provisions of this Natural Gas Pipeline Easement in whole or in part, and Grantee shall have the right and option to operate the Pipeline Facilities for its own use or to lease, sell or assign any or all of the capacity of the Pipeline Facilities or the rights thereto.

22. It is expressly provided that when the Pipeline Facilities constructed hereunder shall be permanently removed from the Permanent Easement, the Grantee, or its successor(s) in interest, shall restore the Permanent Easement and the Lands to its pre-construction condition and said easement shall become null and void and all rights, title and interest shall revert to Grantor or its successor(s) in interest. At such time as Grantee permanently removes the Pipeline Facilities from the Permanent Easement, Grantee shall provide Grantor with a written release of the Permanent Easement to be recorded in the public records of Highlands County, Florida.

23. Except as otherwise granted herein, nothing contained in this Easement shall give Grantee any interest in or ownership of the Grantor's Lands or any rights to any minerals, oil, or gas therein and thereunder or any other sub-surface rights in and to the Grantor's Lands.

24. Grantee shall indemnify and save Grantor harmless from and against all claims, demands, actions or suits in law or in equity (including reasonable costs and expenses incident thereto, as well as all reasonable attorneys' fees and costs incurred by Grantor on account thereof) for or on account of injury, death, damage or loss to the person or property of others, including Grantor and Grantor's employees, agents, officers or invitees and all other persons, firms, or corporations and the public, to the extent caused by the negligence of Grantee in connection with the Pipeline Operations or to the extent that may be caused otherwise by the negligence of Grantee in the exercise of Grantee's rights herein granted.

25. It is hereby stipulated and agreed by and between the parties hereto that from the date of the execution of this Easement by the parties and during the entire term thereof, there shall be no liens or encumbrances for the labor or materials involved in construction and maintenance of the pipeline upon Grantee's interest in the Grantor's property and in the buildings and improvements located thereon. All persons with whom Grantee may deal are put on notice that Grantee has no power to subject Grantor's interest to any lien or encumbrance, and all persons dealing with Grantee must look solely to the credit of Grantee and to Grantee's assets and not to Grantor or Grantor's assets.

26. Neither Grantee, its employees agents or invitees shall bring upon the Grantor's Lands or make, produce or discharge thereon any hazardous or toxic materials, wastes or substances (except as required for construction and as authorized under the appropriate permits) as such terms as defined in the Resource Conservation and Recovery Act (RCRA) (PL 94-590, 90 Stat. 2796 [1976] and amendments thereto, the Clean Water Act of 1972 (33 USC 1321(f)) and subsequent amendments thereto, the Comprehensive Environmental Response Compensation

and Liability Act (CERCLA) (PL 96-510, 94 Stat. 27, 67 [1980] and subsequent amendments thereto, the rules and regulations of the United States Environmental Protection Agency promulgated thereunder, and the rules and regulations of the State of Florida (collectively, the "Hazardous Materials"); and shall not bring upon or leave upon the Grantor's Lands any containers, receptacles or the like containing such wastes, substance or materials. If any materials, wastes or substances left on the Grantor's Lands by Grantee, its employees, agents or invitees should at any time be classified or determined by a governmental authority as substances required to be removed from the Grantor's Lands or disposed of at a qualified hazardous waste or disposal site, Grantee shall be obligated at Grantee's expense to remove and dispose of the same in a regulatory approved manner. Notwithstanding the foregoing prohibitions, should Grantee, its employees, agents or invitees, while occupying or carrying on any operations or activities upon the Grantor's Lands, cause the deposit on the Grantor's Lands or any other area of such wastes, substances or materials which pursuant to any foregoing laws, statutes, rules or regulations or orders of any governmental entity or agency Grantor might have an obligation to clean up or participate in the clean up, Grantee shall assume all such obligations of Grantor thereunder. Grantee hereby agrees to indemnify and save Grantor harmless from any damages, expenses or liabilities resulting from any violation of the provision of this paragraph by Grantee, its employees, agents or invitees or any other person present on the Grantor's Lands as a result of the acts or omissions of Grantee, its employees, agents or invitees. Grantee's obligations under this paragraph, including Grantee's indemnification obligations and Grantee's obligations to remove and dispose of in an approved manner any such materials, substance or wastes brought upon or left upon the Grantor's property by Grantee, its employees, agents or invitees and Grantee's obligations to assume Grantor's obligations or liabilities for clean up as aforesaid shall be continuous and shall survive the expiration or termination of this Natural Gas Pipeline Easement.

27. Grantee hall provide Grantor a copy of the as-built survey for that portion of the pipeline constructed within the Permanent Easement as soon as possible, but not later than June 30, 2012, which documents shall be forwarded by U.S. Mail to Fred Werdine, Esquire, Fowler White Boggs, P.A., 501 E. Kennedy Blvd., Suite 1700, Tampa, Florida 33602.

28. Any and all notices to be given under this Natural Gas Pipeline Easement shall be sent by Certified Mail, return receipt requested, postage prepaid, or by reliable confirmed overnight courier at the following addresses:

Grantor:	Charles P. Lykes, Jr. Lykes Bros. Inc. Executive Vice President 106 SW CR 721 Okeechobee, Florida 34974
With a copy to:	Lykes Bros. Inc. General Counsel 400 N. Tampa Street Tampa, Florida 33602
Grantee:	Florida Gas Transmission Company, LLC 5444 Westheimer Road Houston, Texas 77056

29. This Natural Gas Pipeline Easement incorporates and describes all of the grants, undertakings, conditions and consideration of the parties. Grantor, in executing and delivering this Natural Gas Pipeline Easement, represents that Grantor has not relied upon any promises, inducements or representations of Grantee or its agents or employees, except as are expressly set forth herein.

30. Nothing contained herein shall be deemed or construed to be a merger, release, waiver, modification or amendment of any rights Grantee presently owns or holds, as reflected in the official records of the county where the Permanent Easement and Temporary Construction Easement are located.

31. This Natural Gas Pipeline Easement may be executed in counterparts, all of which together shall constitute a single document.

32. The rights, benefits, burdens and obligations acquired or assumed under the provisions of this Natural Gas Pipeline Easement shall inure to, benefit, bind and oblige Grantor, Grantee and their respective successors and assigns.

EXHIBIT "A"

LEGAL DESCRIPTION AND SKETCH OF REAL PROPERTY WHERE FLORIDA GAS SHALL ACQUIRE EASEMENT INTERESTS AND RIGHTS

Exhibit A-1

Parcels Acquired (including and incorporating attached sketches and legal descriptions):

FL-HIGH-099/100/102/103/111/112/113/115
FL-HIGH-117
FL-HIGH-119

Schedule II to the Stipulated Order of Taking and Final Judgment

SPECIAL CONTRUCTION CONDITIONS FOR PARCELS FL-HIGH-099/100/102/103/111/112/113/115
FL-HIGH-117
FL-HIGH-119

Contractor shall:

1. Re-construct affected access points to SR 70 to FDOT standards, and maintain access through out construction
2. Follow Grantor's phytosanitary (agricultural plant and animal health) procedures, as well as those required by the State of Florida and/or federal law or regulation.
3. Bury the pipeline to Provide at least 48 inches of cover between the pipe and the surface of the land or the bottom of any drainage or irrigation ditches.
4. Repair any damaged drainage ditches or irrigation facilities
5. Coordinate schedule with Property owner of which drainage and irrigation facilities cannot be used during active construction, but shall take any one drainage segment out of service for longer than one month
6. Plant Argentine bahia grass seed or such other seed as the parties may agree to on all other land surfaces disturbed by the Pipeline Operations
7. Construct a fence with gate(s) along the entire North side of the Permanent Easement and/or the Temporary Construction Easement (whichever boundary is most North) to properly enclose all cattle and other animals owned by Grantor on the Lands. Such fence shall be built and maintained to Grantor's specifications which include a five (5) strand barbed wire fence with four inch posts, every fifteen (15) feet, and sixteen (16) foot steel pipe gates.
8. **Not** bring upon the Lands or make, produce or discharge thereon any hazardous or toxic materials, wastes or substances (except as required for construction and as authorized under the appropriate permits)

FOWLER WHITE BOGGS
Attorneys at Law
Est 1943

April 21, 2011

John Tallent
Lykes Bros. Inc.
106 SW County Road 721
Okeechobee, FL 34974

Re: Florida Gas Transmission
Parcels FL-HIGH-099, 100, 102, 103, 111, 112, 113, 115, 117, and 119

Dear John:

Enclosed please find a certified copy of the As Built Surveys which we received from Florida Gas for the above-referenced parcels, together with a copy of the April 19, 2011 transmittal letter from Erik Breitinger of Florida Gas. If you have any questions, please give me a call.

Sincerely yours,

FOWLER WHITE BOGGS PA

Fred S Werdine/cd

for Fred S. Werdine

FSW/cd
Enc.

Florida Gas Transmission Company

A **Southern Union/El Paso** Affiliate

5444 Westheimer Road
Houston, TX 77056-5306

P.O. Box 4967
Houston, TX 77210-4967
713.989.7000

April 19, 2011

Fowler, White, Boggs, P. A.
c/o Fred Werdine, Esquire
501 E Kennedy Boulevard, Suite 1700
Tampa, Florida 33602

Re: FL-HIGH-099, 100, 102, 103, 111, 112, 113, 115, 117, 119 – Lykes Brothers, Inc.

Dear Mr. Werdine,

Per the Stipulated Order of Taking and Final Judgment with Florida Gas Transmission dated March 2, 2010, attached are two certified As-Built surveys each for FGT tract numbers FL- HIGH-099, 100, 102, 103, 111, 112, 113, 115, FL-HIGH-117, and FL-HIGH-119 .

FLORIDA GAS TRANSMISSION COMPANY, LLC

By: Erik Breitinger by KAA
Erik Breitinger
Right-of-Way Manager

Enclosures

Florida Gas Transmission Company

A Southern Union/El Paso Affiliate

5444 Westheimer Road
Houston, TX 77056-5306

P.O. Box 4967
Houston, TX 77210-4967
713.989.7000

AS-BUILT TRANSMITTAL

Date: April 19, 2011

To:

Fowler, White, Boggs, P.A.
c/o Fred Werdine, Esquire
501 E. Kennedy Boulevard, Suite 1700
Tampa, Florida 33602

From:

Florida Gas Transmission
5444 Westheimer Road
Houston, Texas 77056-5306

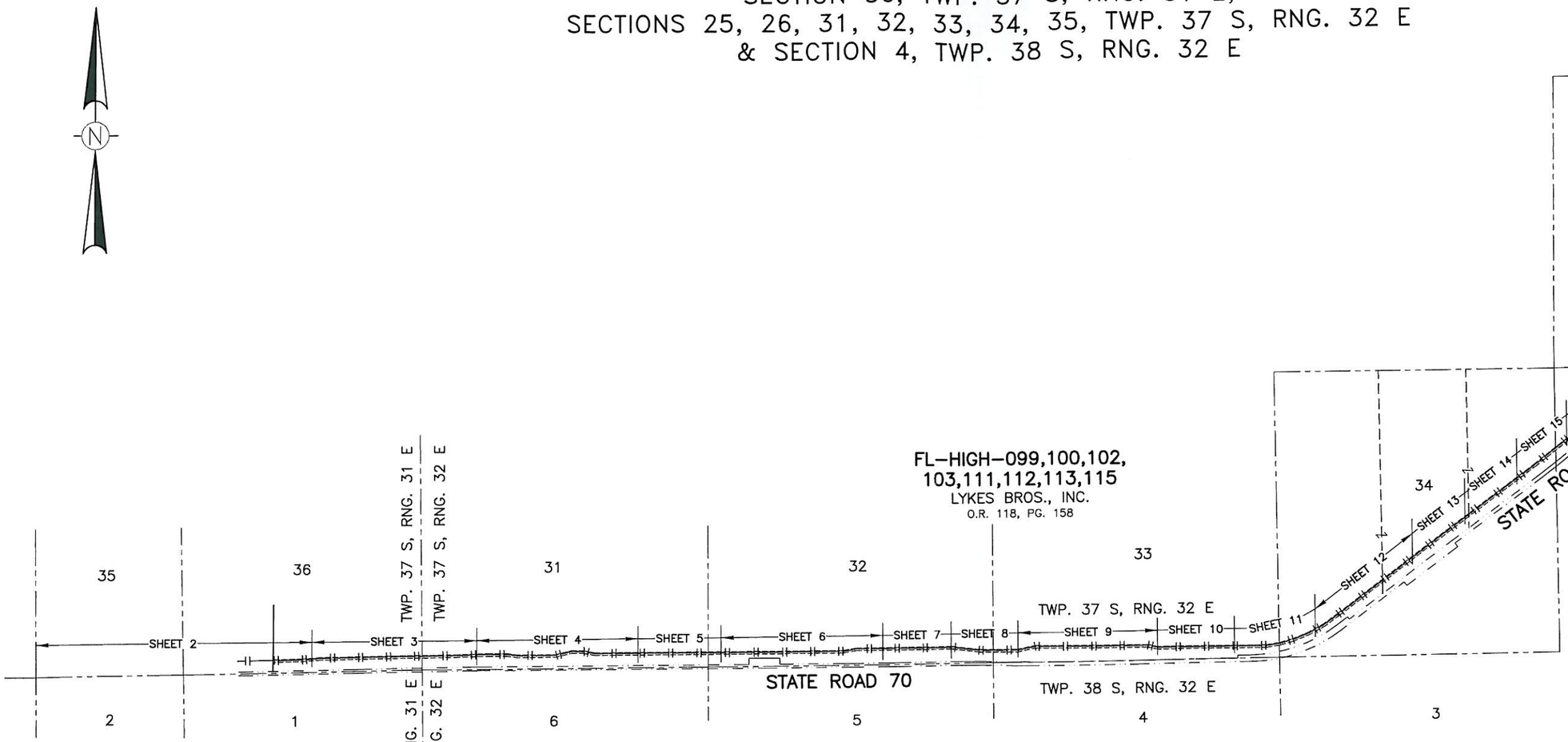
Tract #: FL-HIGH-099, 100, 102, 103, 111, 112, 113, 115, 117, 119 – Lykes Brothers, Inc.

# of Copies Sent	Issue Date	Drawing #	Rev #
1 2	4/14/2011	FL-HIGH-099, 100, 102, 103, 111, 112, 113, 115AB	0
2	4/14/2011	FL-HIGH-117AB	0
2	4/14/2011	FL-HIGH-119AB	0

Sent via: Certified mail

HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
SECTIONS 25, 26, 31, 32, 33, 34, 35, TWP. 37 S, RNG. 32 E
& SECTION 4, TWP. 38 S, RNG. 32 E



LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
▨	=	PERMANENT EASEMENT

F.G.T. TRACT Nos.

FL-HIGH-099
FL-HIGH-100
FL-HIGH-102
FL-HIGH-103
FL-HIGH-111
FL-HIGH-112
FL-HIGH-113
FL-HIGH-115

SAM J. COOPER III
PROFESSIONAL LAND SURVEYOR
FLORIDA REGISTRATION NUMBER 4900
NOT VALID WITHOUT SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

NOTES:

1. *BEARINGS SHOWN HEREON ARE BASED ON THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983 WITH THE WEST BOUNDARY OF THE NORTHWEST 1/4 OF SECTION 35, TOWNSHIP 37 SOUTH, RANGE 32 EAST, AS SHOWN ON SHEET 15, BEING N 00°27'58" W.*
2. *LAST DATE OF AS-BUILT SURVEY: 03/2011.*

PREPARED BY

UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS-BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: N.T.S.		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS-BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO.
622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO.
FL-HIGH-099,100,102, 103,111,112,113,115AB
SHT. 1 OF 22
0

HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
SECTIONS 25, 26, 31, 32, 33, 34, 35, TWP. 37 S, RNG. 32 E
& SECTION 4, TWP. 38 S, RNG. 32 E

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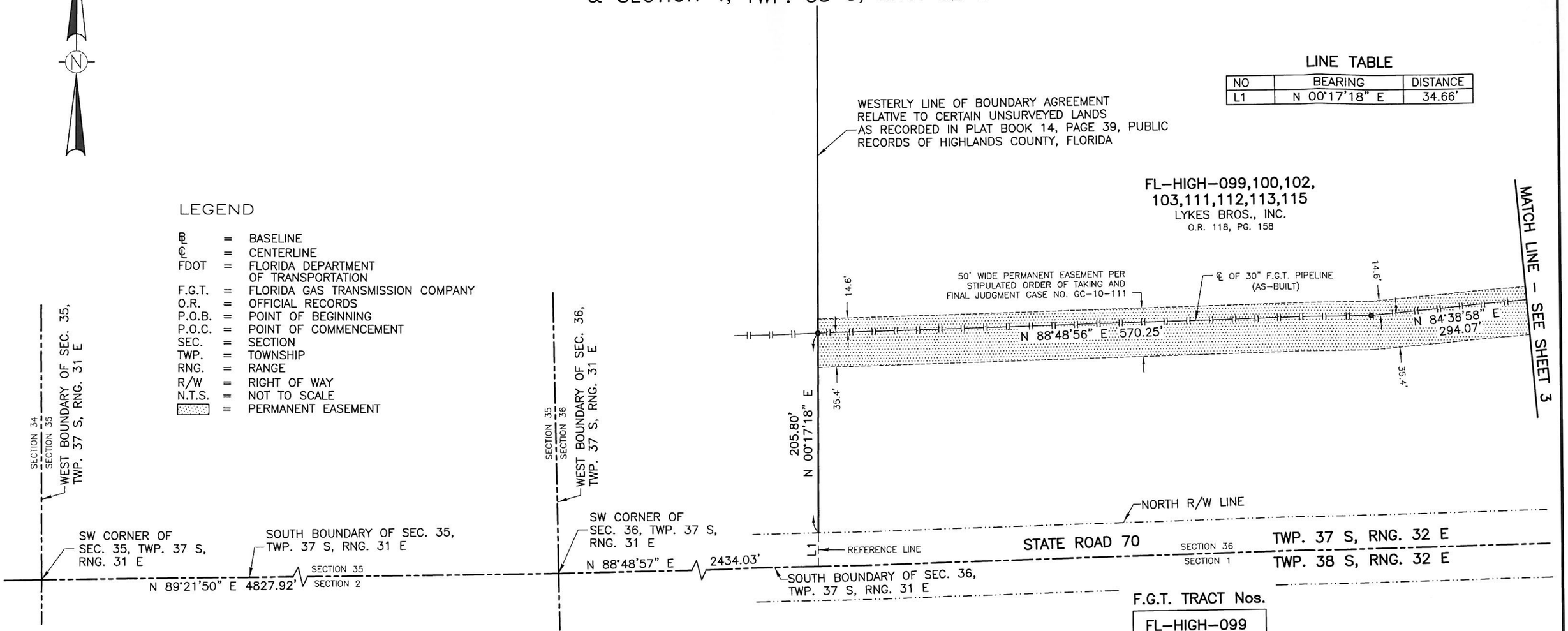
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L1	N 00°17'18" E	34.66'



F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
FL–HIGH–112
FL–HIGH–113
FL–HIGH–115

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977–7770
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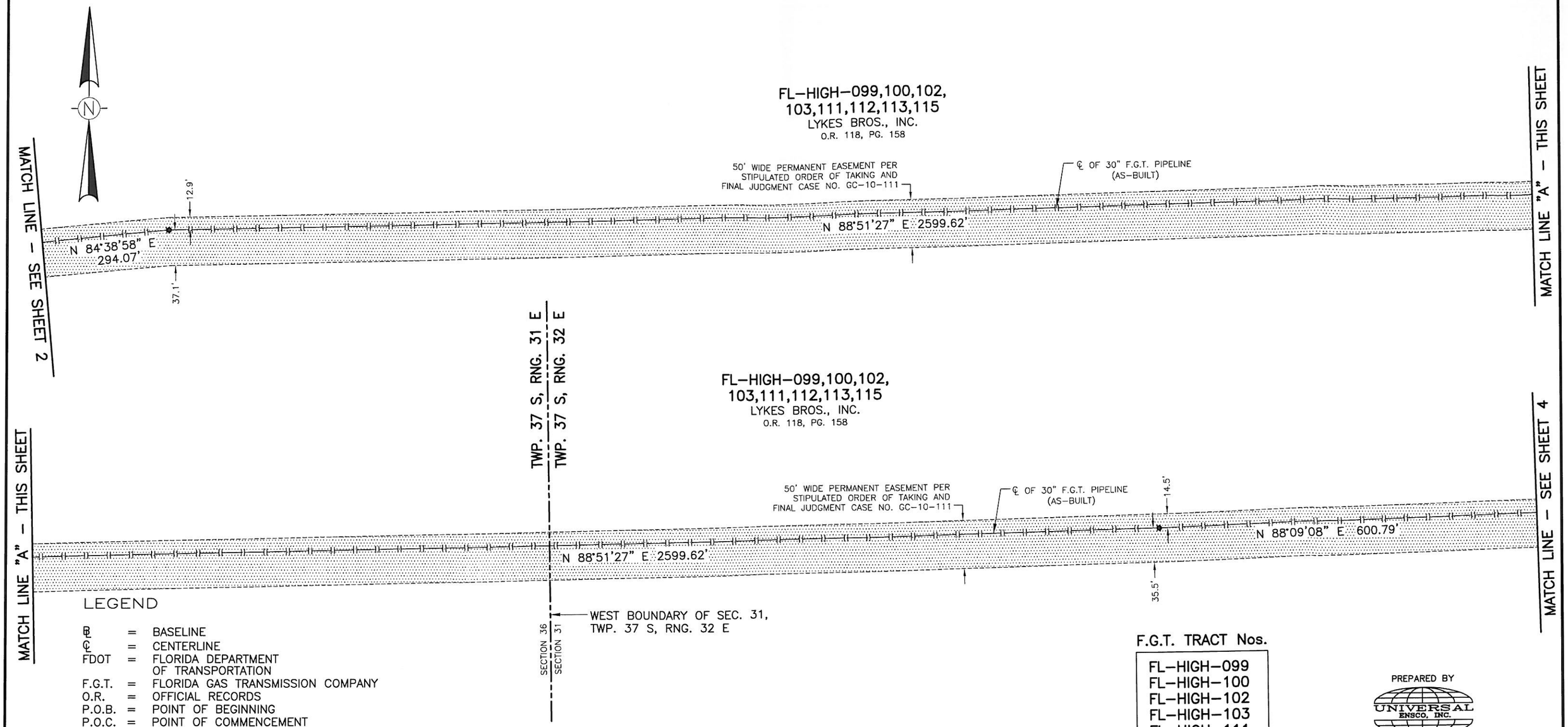
DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=100'		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL–HIGH–099,100,102, 103,111,112,113,115AB
SHT. 2 OF 22
0



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ASBUILT		
FILE NO.:		
SCALE: 1"=100'		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO.
622012
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DWG. NO.
FL–HIGH–099,100,102,
103,111,112,113,115AB
SHT. 3 OF 22
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HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
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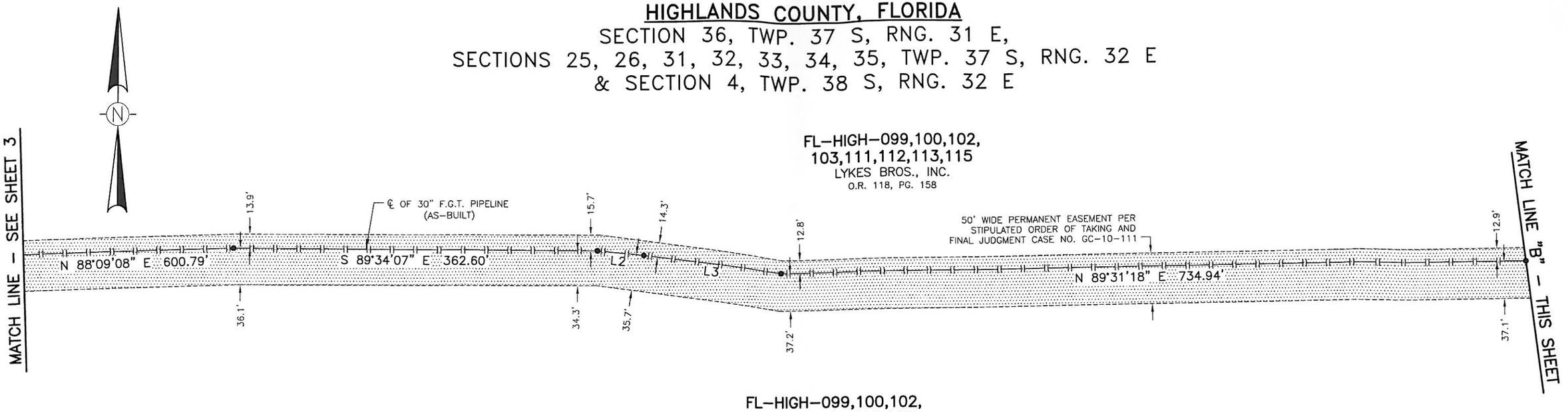

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	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L2	S 83°54'16" E	45.84'
L3	S 82°43'52" E	138.95'
L4	S 80°36'15" E	14.13'

F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
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FL–HIGH–113
FL–HIGH–115

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4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
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CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=100'		

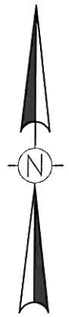
Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL–HIGH–099,100,102, 103,111,112,113,115AB
SHT. 4 OF 22
0

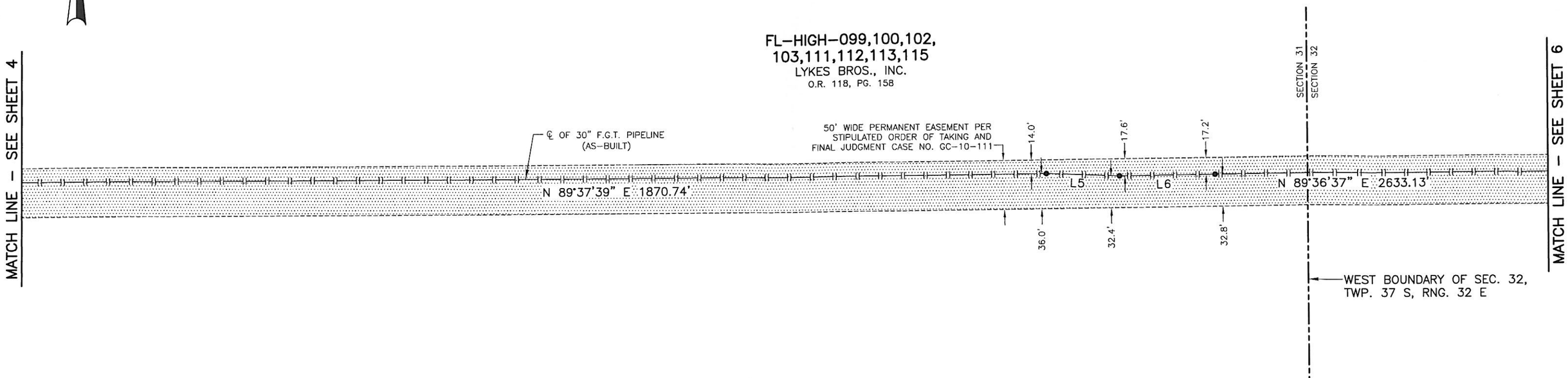
HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
SECTIONS 25, 26, 31, 32, 33, 34, 35, TWP. 37 S, RNG. 32 E
& SECTION 4, TWP. 38 S, RNG. 32 E



LINE TABLE

NO	BEARING	DISTANCE
L5	S 87°38'17" E	75.12'
L6	N 89°27'21" E	97.93'



LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
FL–HIGH–112
FL–HIGH–113
FL–HIGH–115

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977–7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS–BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
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30" GAS PIPELINE
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PROJECT NO.
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FL–HIGH–099,100,102,
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SHT. 5 OF 22
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HIGHLANDS COUNTY, FLORIDA

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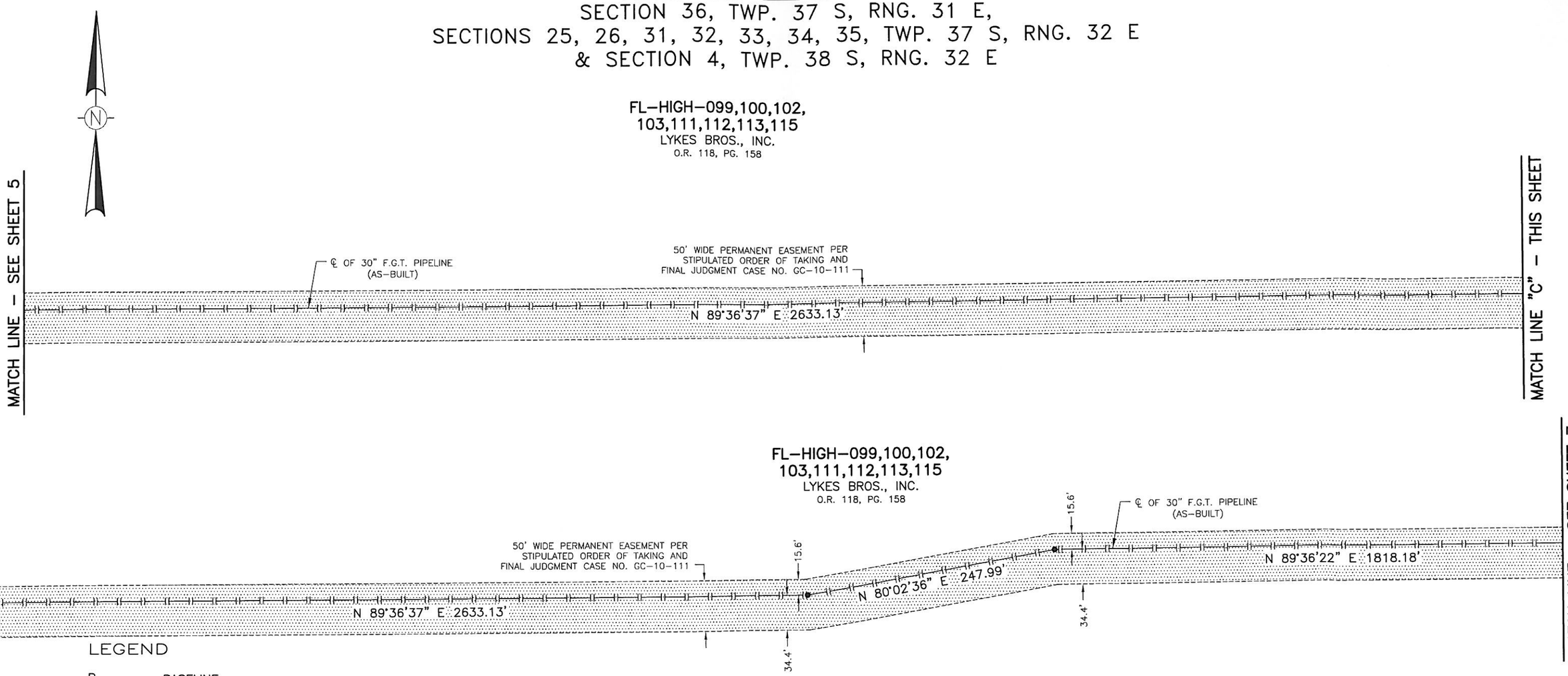

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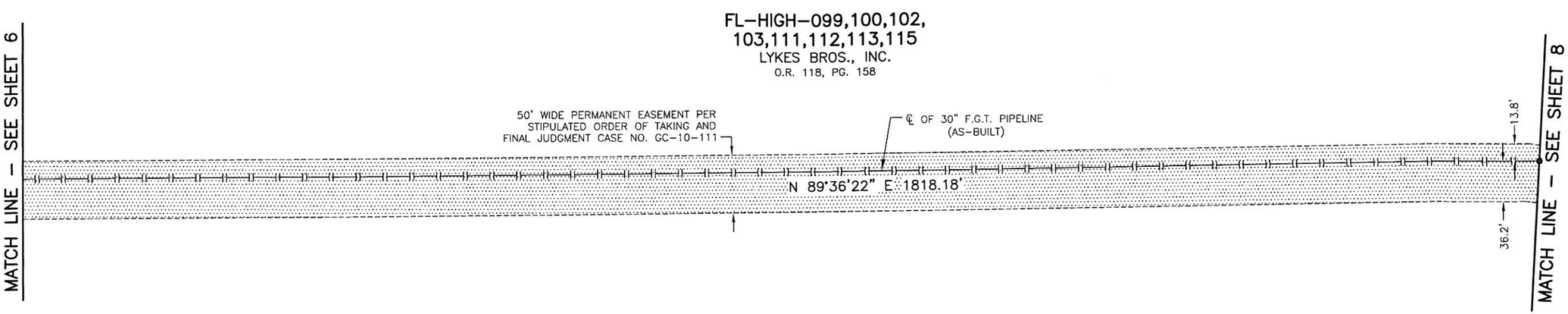

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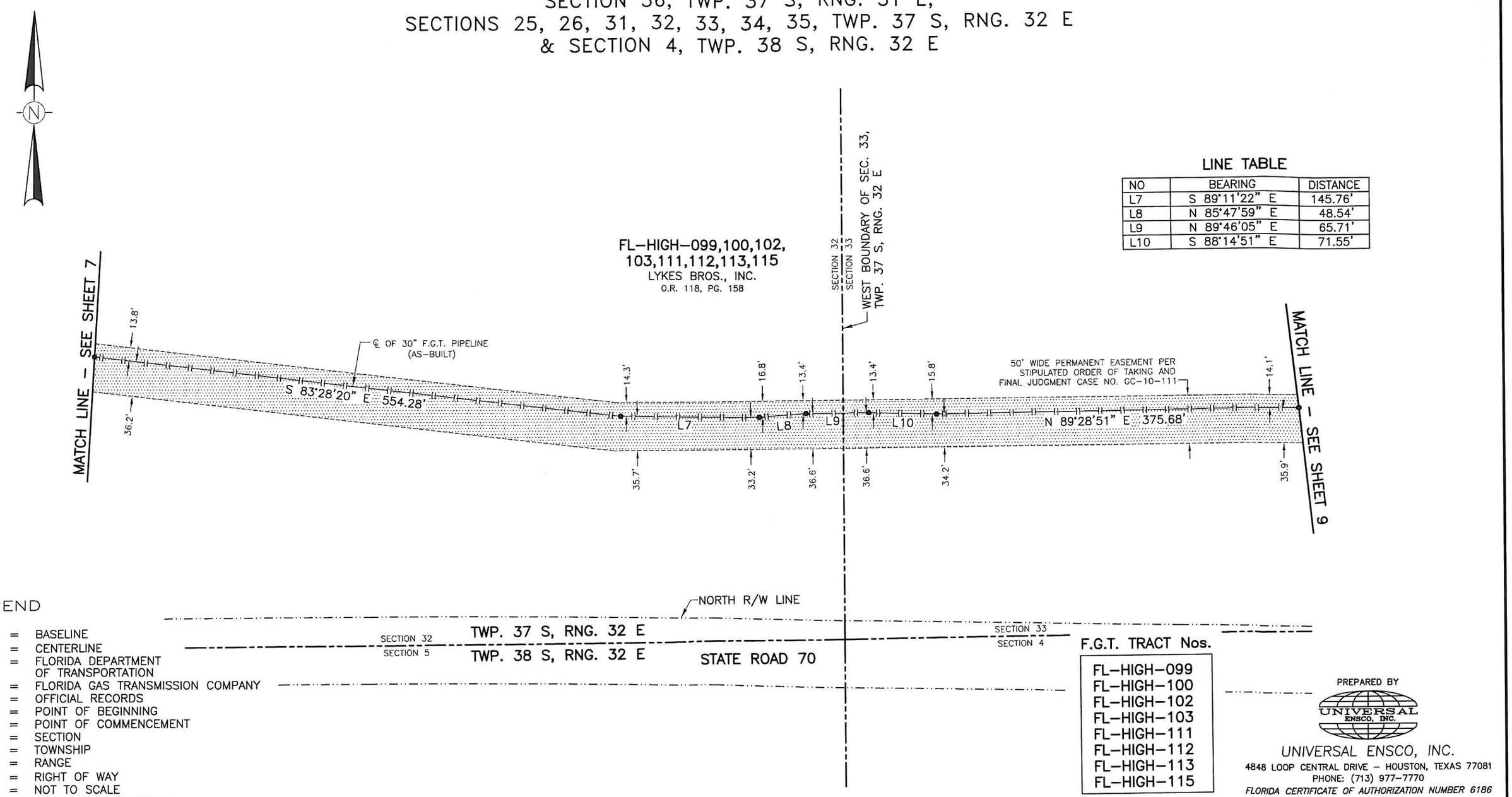

LINE TABLE

NO	BEARING	DISTANCE
L7	S 89°11'22" E	145.76'
L8	N 85°47'59" E	48.54'
L9	N 89°46'05" E	65.71'
L10	S 88°14'51" E	71.55'

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NORTH R/W LINE

SECTION 32 / SECTION 5 — TWP. 37 S, RNG. 32 E
TWP. 38 S, RNG. 32 E — STATE ROAD 70
SECTION 33 / SECTION 4

F.G.T. TRACT Nos.

FL–HIGH–099
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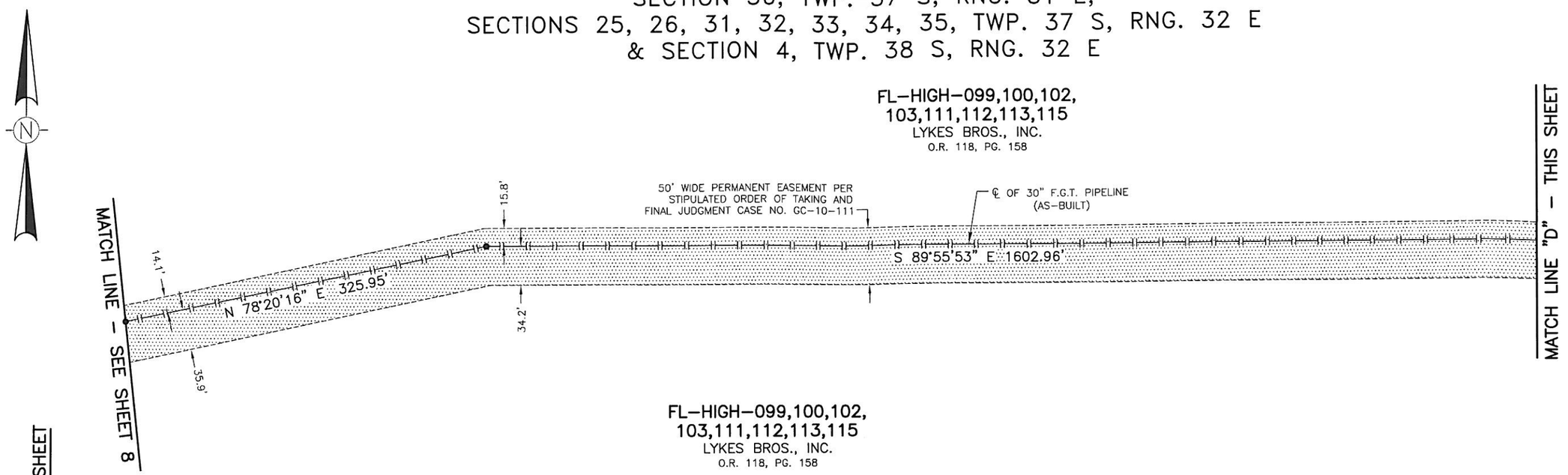

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LINE TABLE

NO	BEARING	DISTANCE
L11	N 88°09'52" E	64.09'

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FL–HIGH–099
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FL–HIGH–103
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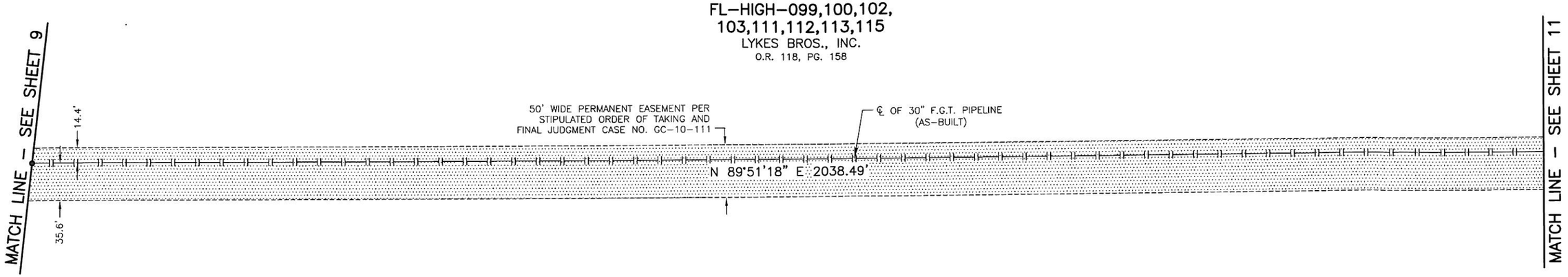

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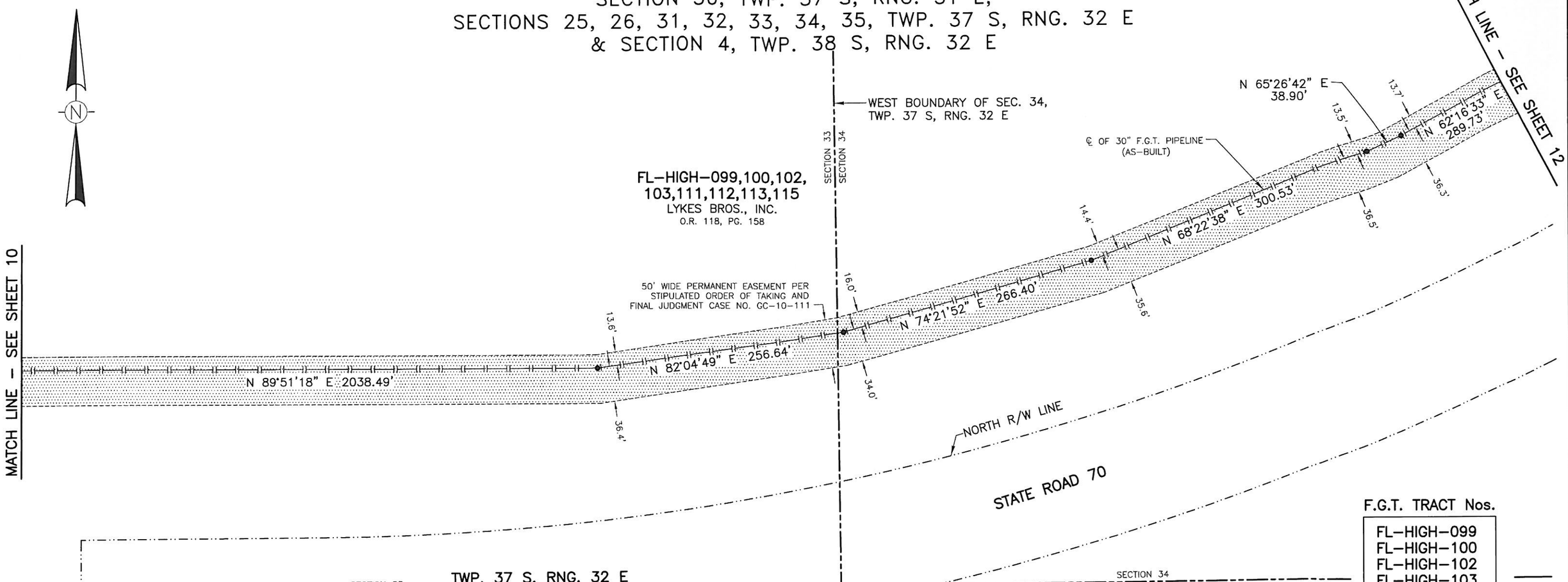

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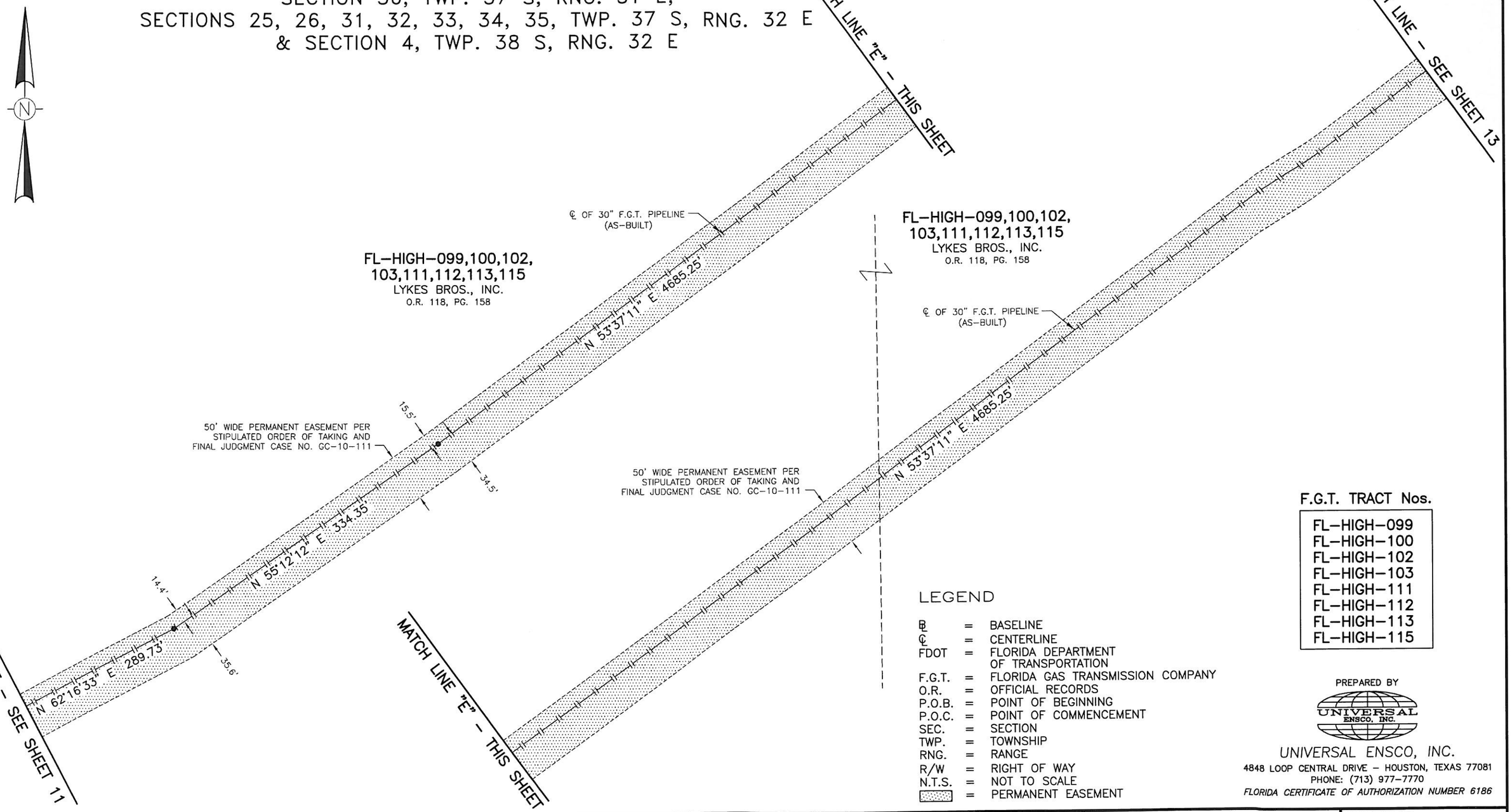

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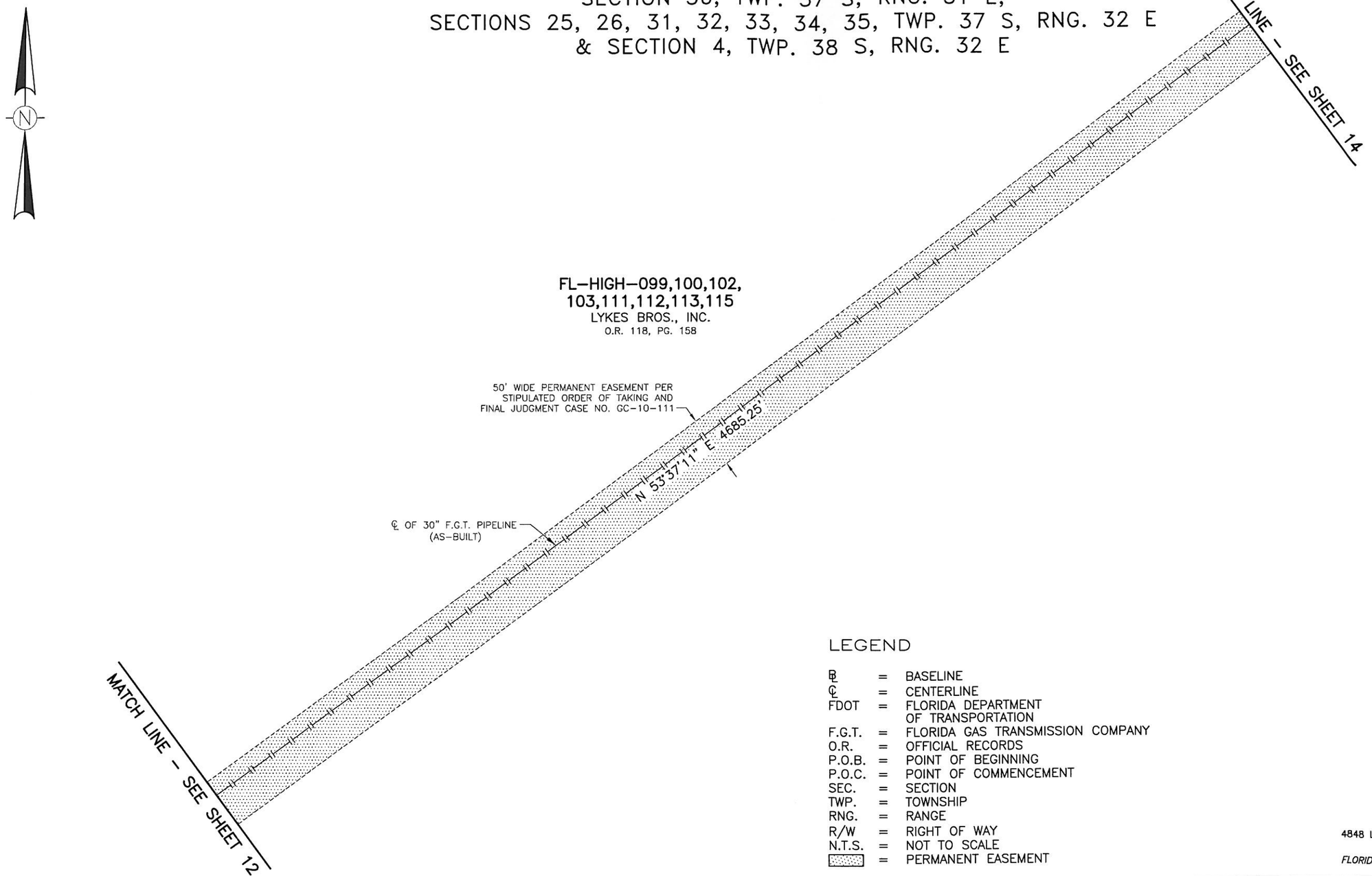

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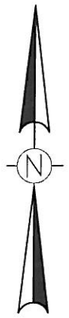

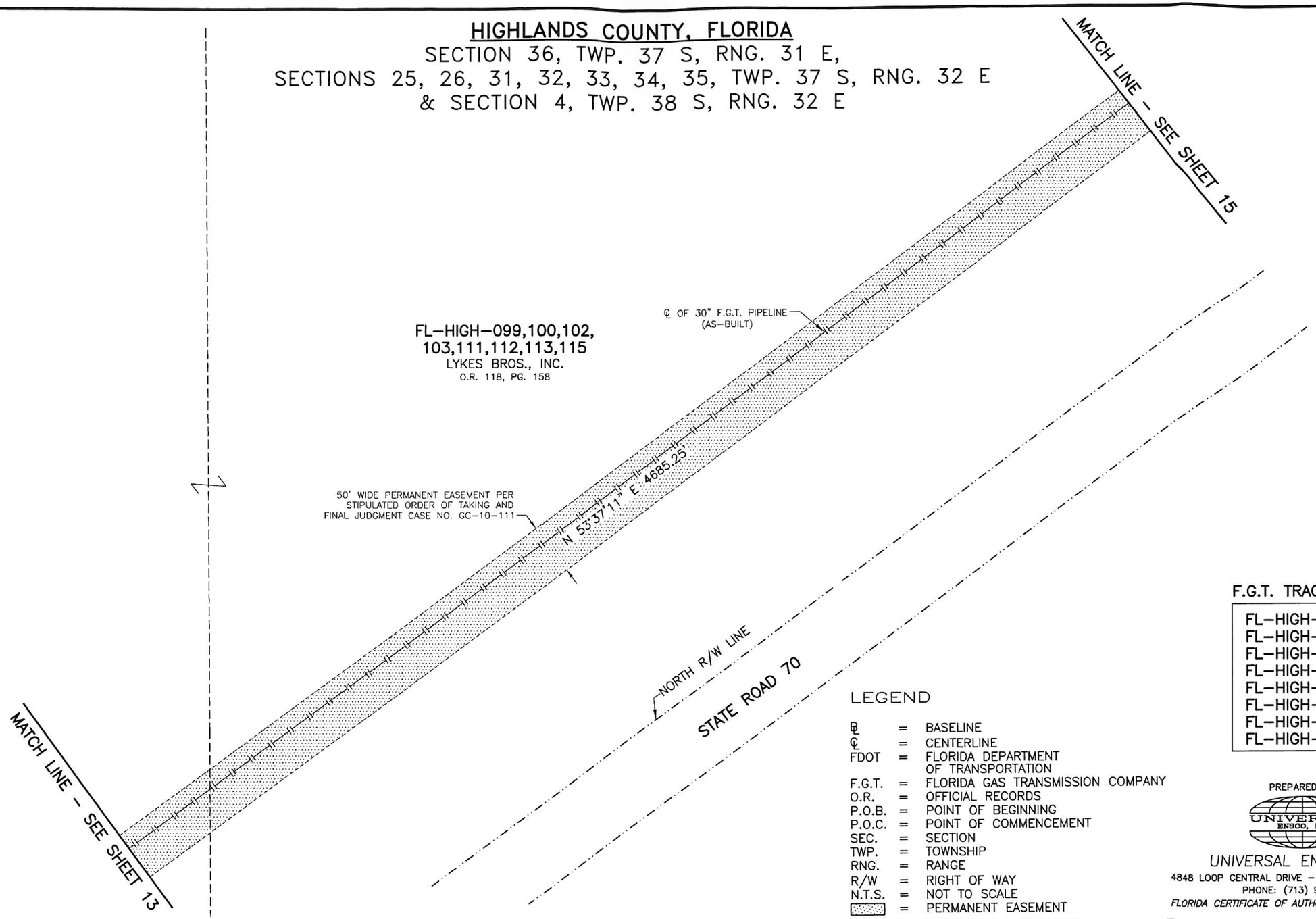

F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
FL–HIGH–112
FL–HIGH–113
FL–HIGH–115

LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

PREPARED BY

UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977–7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS–BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
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CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=100'		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO.
622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO.
FL–HIGH–099,100,102,
103,111,112,113,115AB
SHT. 14 OF 22
0

HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
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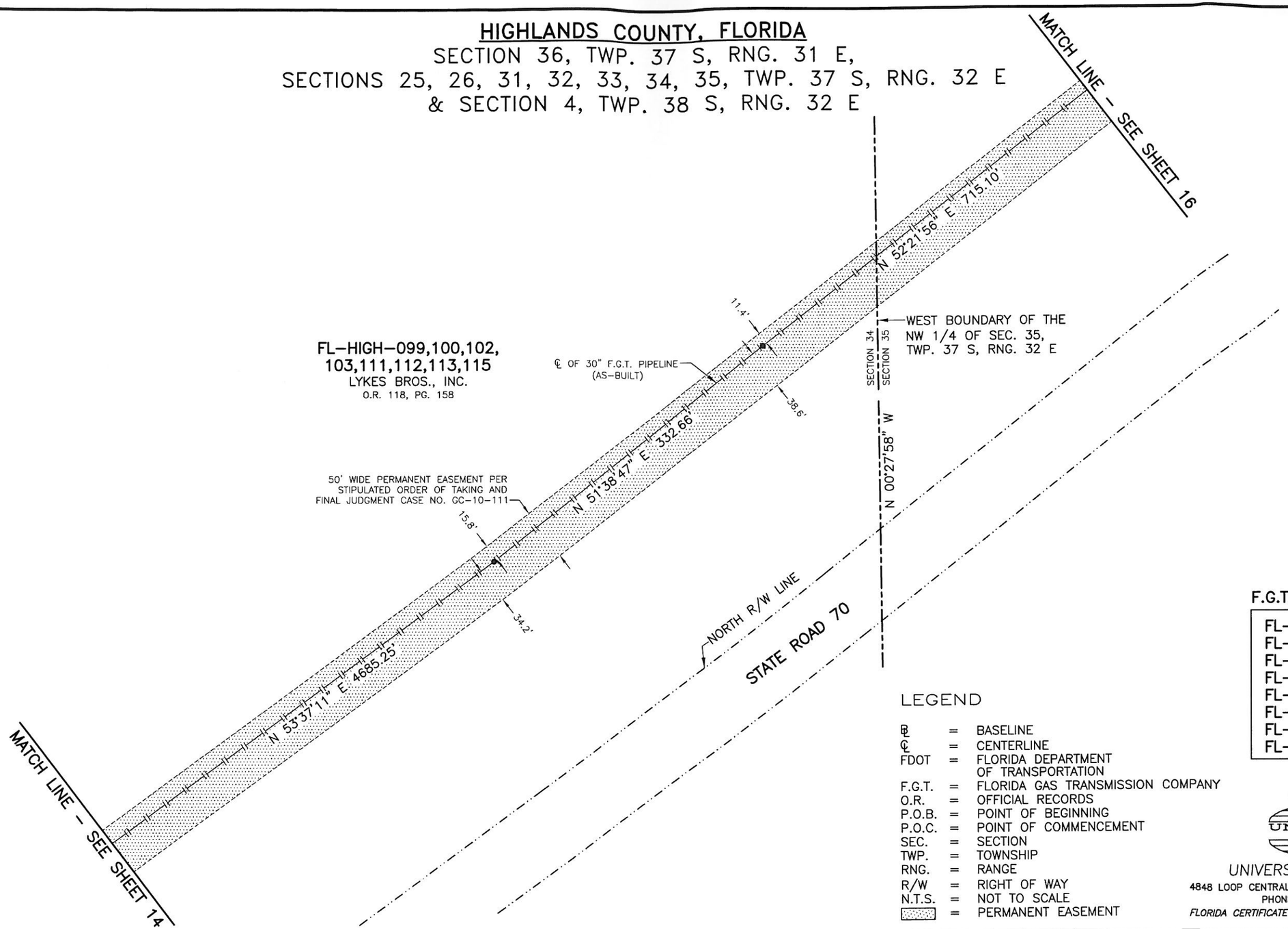

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HIGHLANDS COUNTY, FLORIDA

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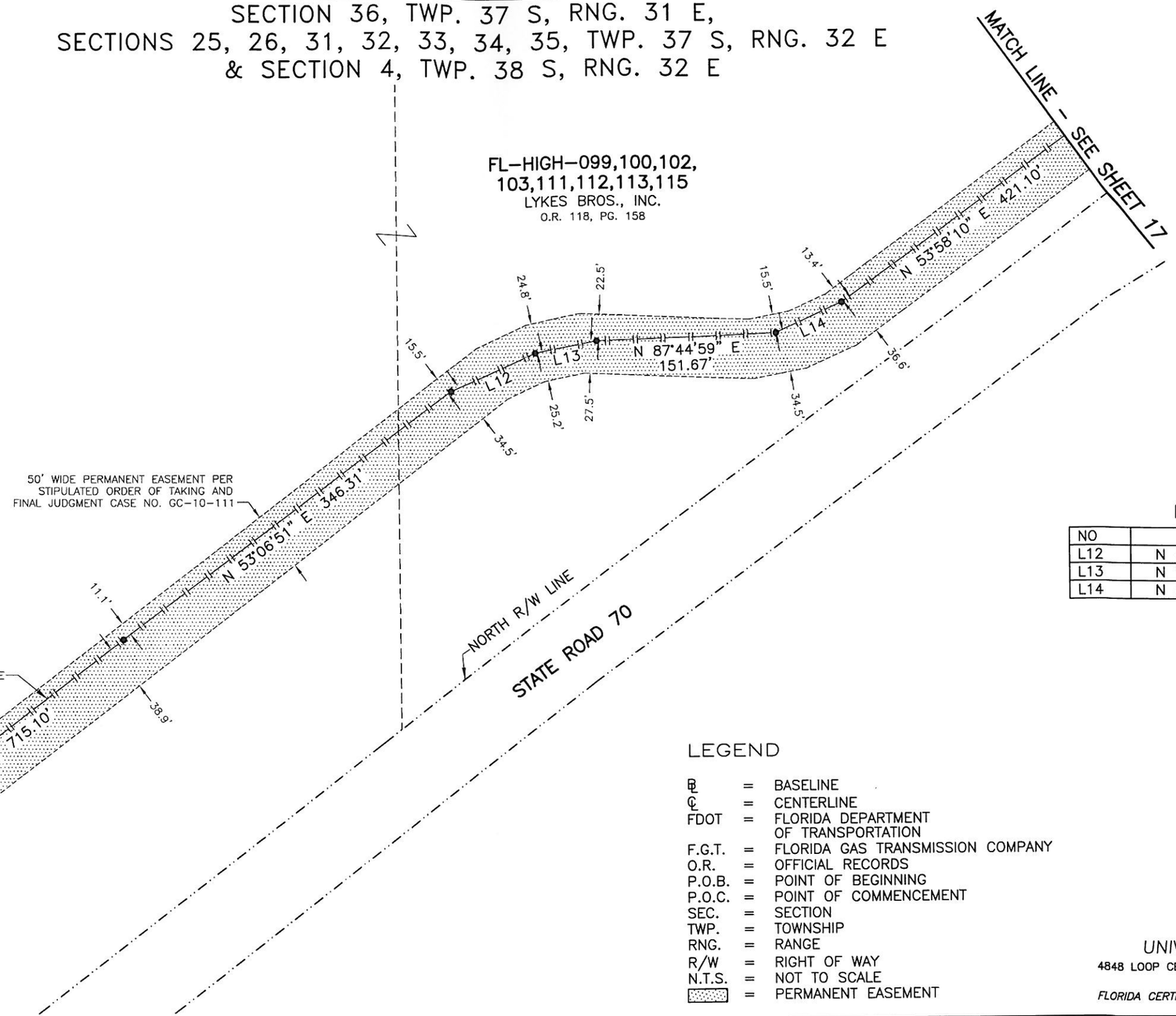

LINE TABLE

NO	BEARING	DISTANCE
L12	N 66°06'57" E	78.20'
L13	N 79°19'32" E	52.29'
L14	N 65°43'22" E	61.45'

F.G.T. TRACT Nos.

- FL–HIGH–099
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DWG. NO. FL–HIGH–099,100,102, 103,111,112,113,115AB
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HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
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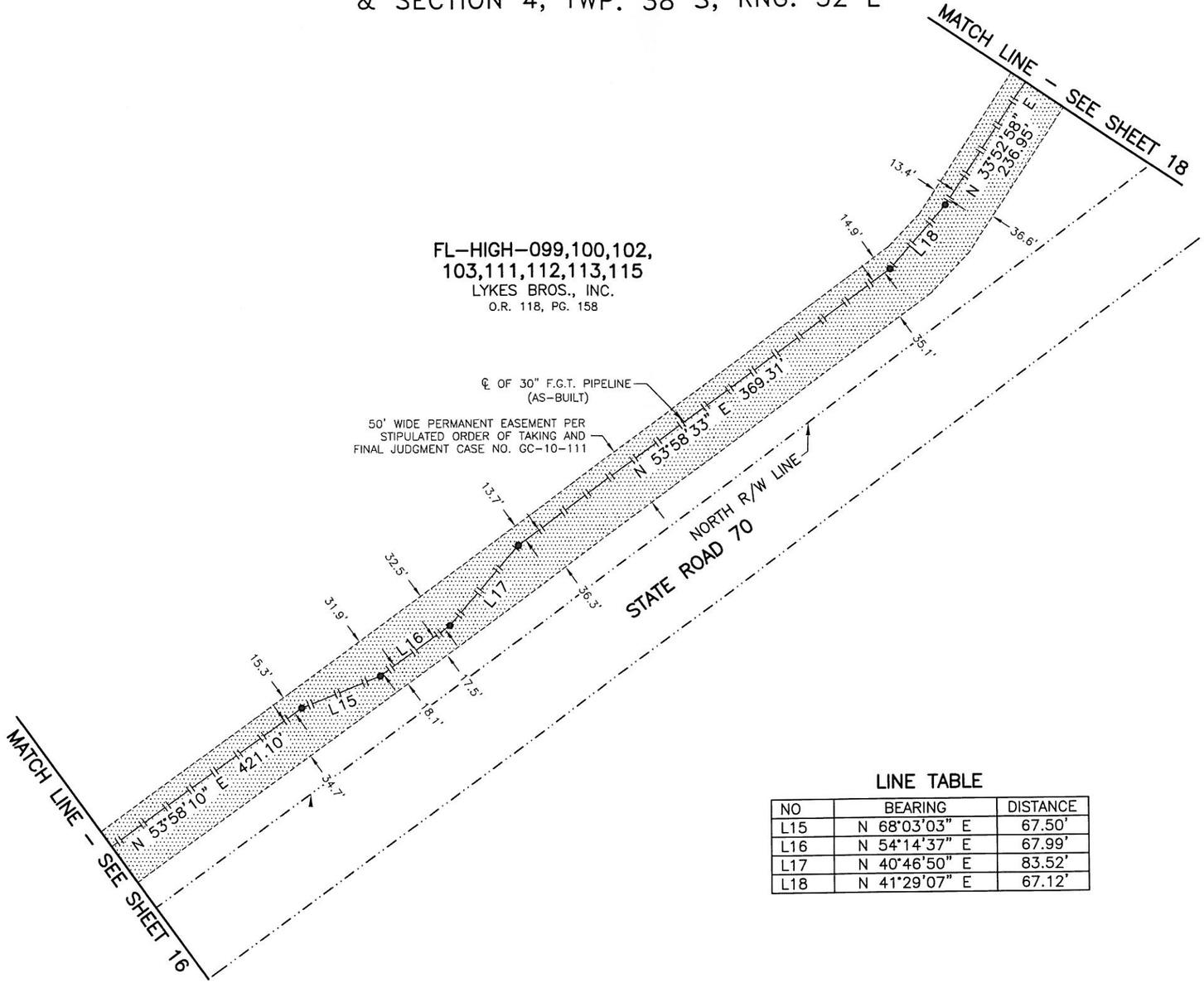

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R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L15	N 68°03'03" E	67.50'
L16	N 54°14'37" E	67.99'
L17	N 40°46'50" E	83.52'
L18	N 41°29'07" E	67.12'

F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
FL–HIGH–112
FL–HIGH–113
FL–HIGH–115

PREPARED BY
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4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977–7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

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DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
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CONSTRUCTION YR		
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Florida Gas Transmission Company
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HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
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HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL–HIGH–099,100,102, 103,111,112,113,115AB
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HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
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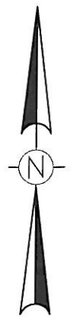
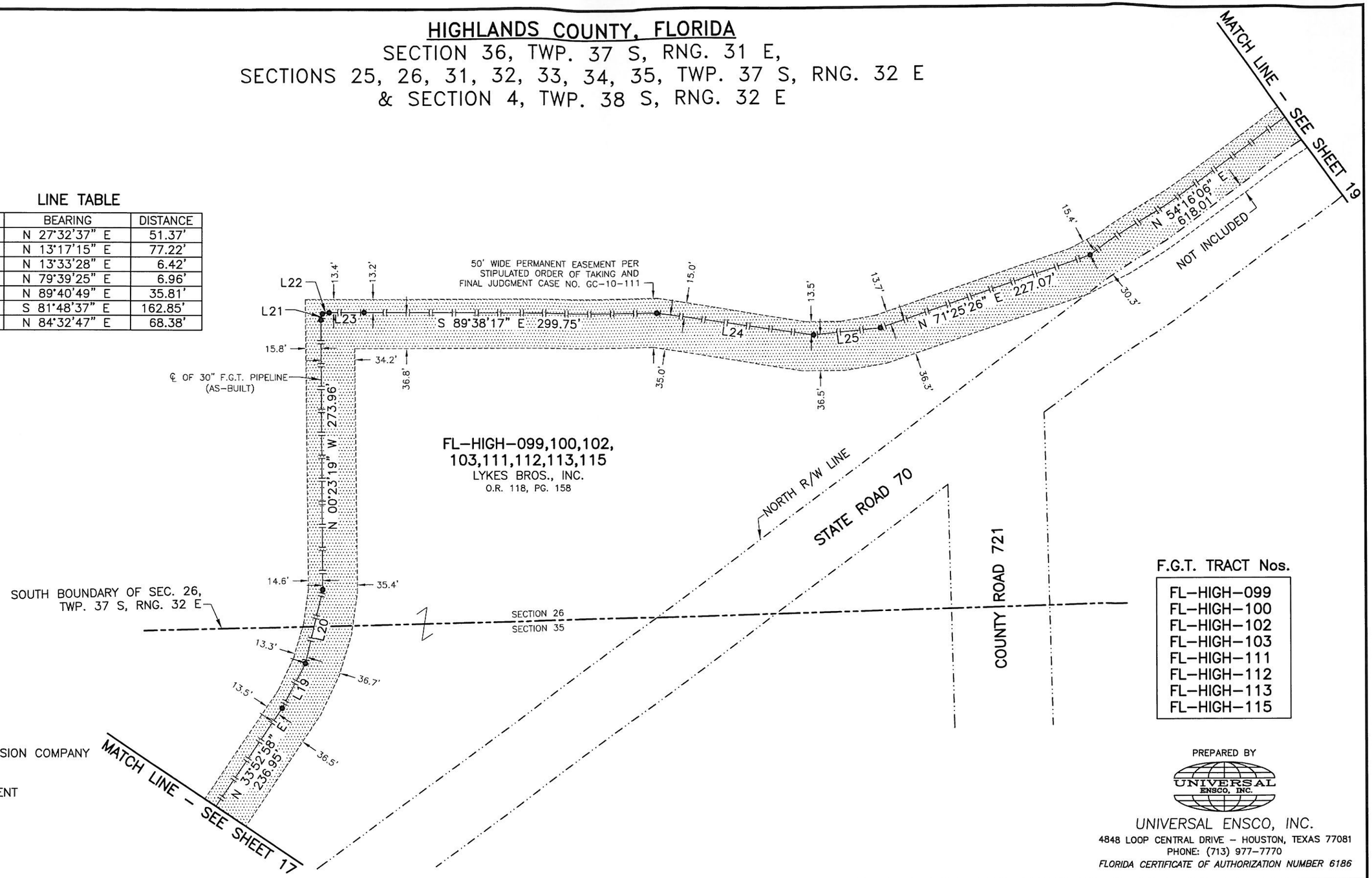


LINE TABLE

NO	BEARING	DISTANCE
L19	N 27°32'37" E	51.37'
L20	N 13°17'15" E	77.22'
L21	N 13°33'28" E	6.42'
L22	N 79°39'25" E	6.96'
L23	N 89°40'49" E	35.81'
L24	S 81°48'37" E	162.85'
L25	N 84°32'47" E	68.38'



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- FL-HIGH-112
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- FL-HIGH-115

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PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

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CONSTRUCTION YR		
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FILE NO.:		
SCALE: 1"=100'		

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HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL-HIGH-099,100,102, 103,111,112,113,115AB
SHT. 18 OF 22
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HIGHLANDS COUNTY, FLORIDA

SECTION 36, TWP. 37 S, RNG. 31 E,
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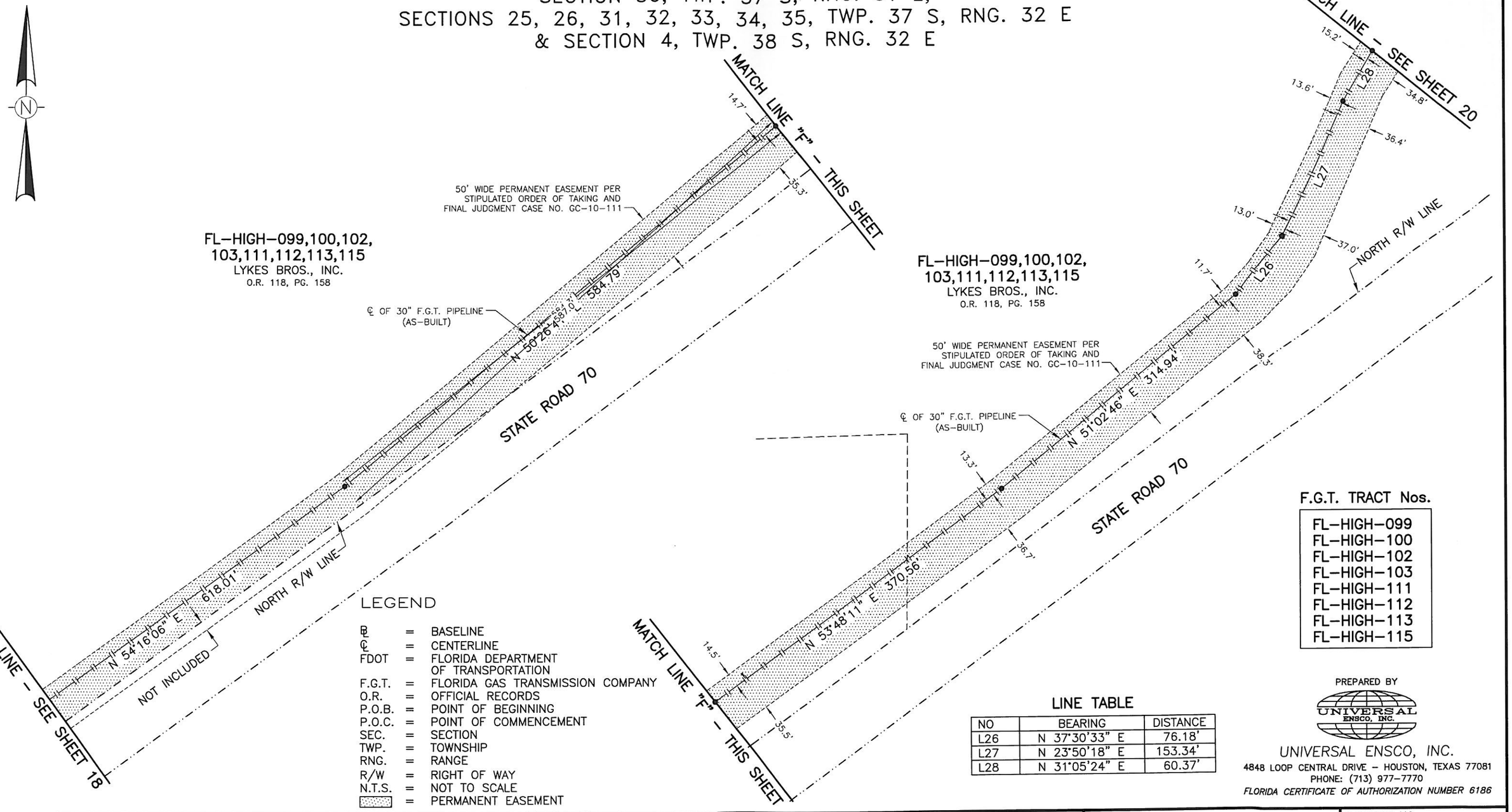

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RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L26	N 37°30'33" E	76.18'
L27	N 23°50'18" E	153.34'
L28	N 31°05'24" E	60.37'

F.G.T. TRACT Nos.

FL-HIGH-099
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FL-HIGH-102
FL-HIGH-103
FL-HIGH-111
FL-HIGH-112
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HIGHLANDS COUNTY, FLORIDA

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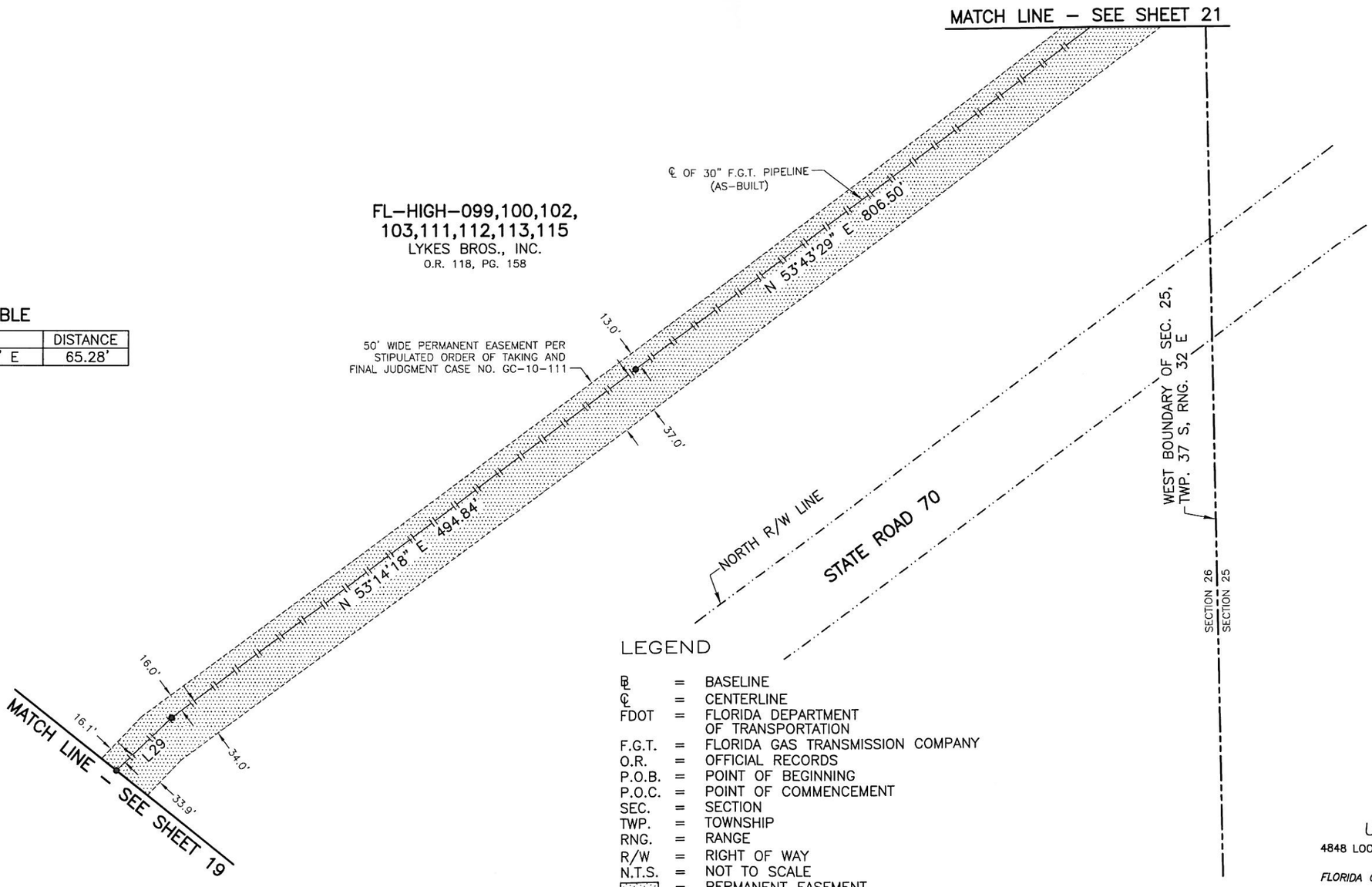

LINE TABLE

NO	BEARING	DISTANCE
L29	N 46°18'39" E	65.28'

LEGEND

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HIGHLANDS COUNTY, FLORIDA

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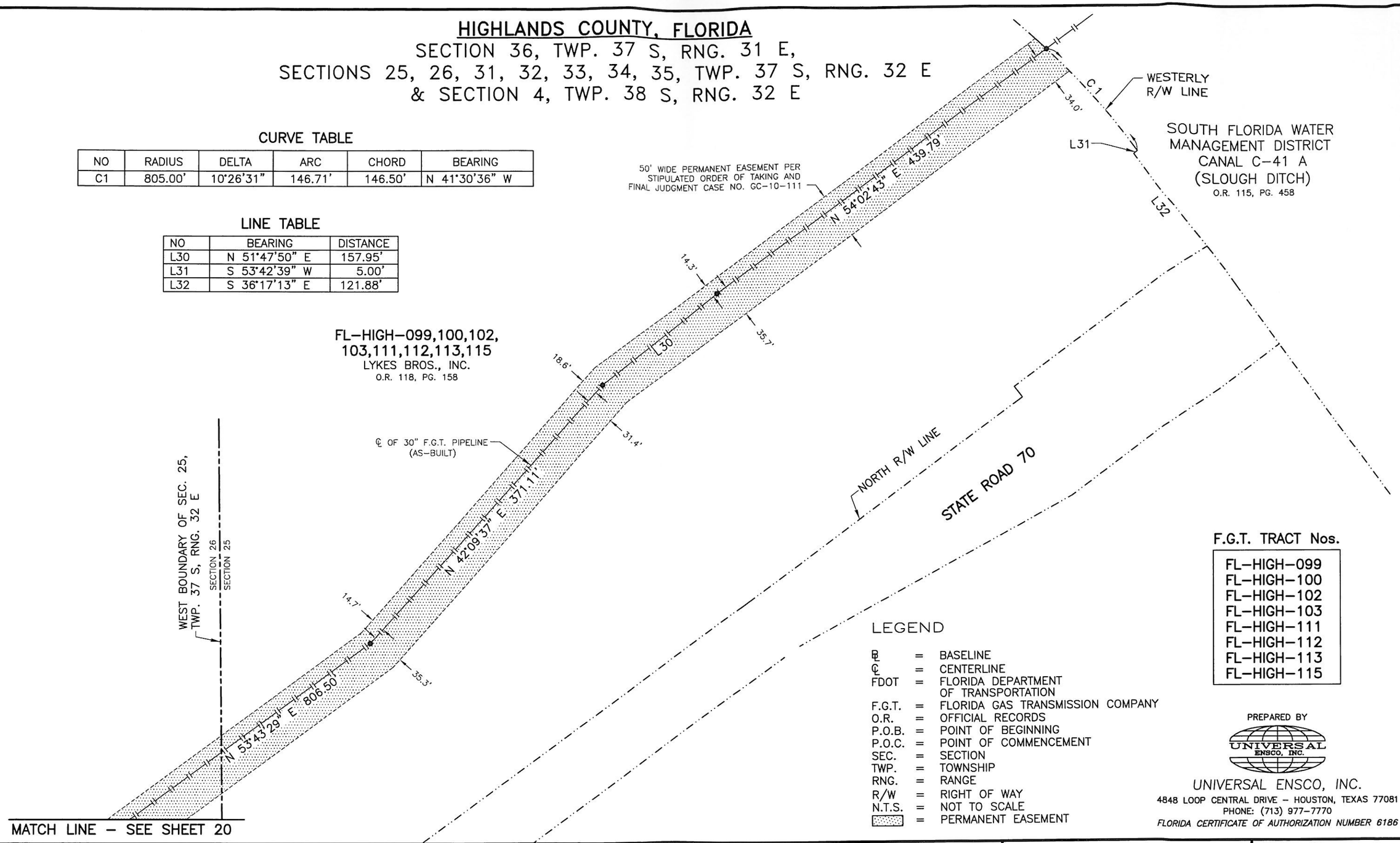
CURVE TABLE

NO	RADIUS	DELTA	ARC	CHORD	BEARING
C1	805.00'	10°26'31"	146.71'	146.50'	N 41°30'36" W

LINE TABLE

NO	BEARING	DISTANCE
L30	N 51°47'50" E	157.95'
L31	S 53°42'39" W	5.00'
L32	S 36°17'13" E	121.88'



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HIGHLANDS COUNTY, FLORIDA

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& SECTION 4, TWP. 38 S, RNG. 32 E

PERMANENT EASEMENT OF RECORD AS DESCRIBED IN STIPULATED ORDER OF TAKING AND FINAL JUDGMENT CASE NO. GC–10–111, PUBLIC RECORDS OF HIGHLANDS COUNTY, FLORIDA.

A 50 FOOT WIDE STRIP OF LAND, LYING IN AND BEING A PART OF SECTION 36, TOWNSHIP 37 SOUTH, RANGE 31 EAST AND SECTIONS 25, 26, 31, 32, 33, 34 AND 35, TOWNSHIP 37 SOUTH, RANGE 32 EAST, HIGHLANDS COUNTY, FLORIDA, BEING A PORTION OF THAT PROPERTY DESCRIBED IN OFFICIAL RECORDS BOOK 118, PAGE 158, PUBLIC RECORDS OF SAID COUNTY, THE CENTERLINE OF SAID STRIP BEING DESCRIBED AS FOLLOWS: COMMENCE AT THE SOUTHWEST CORNER OF SECTION 35, TOWNSHIP 37 SOUTH, RANGE 31 EAST; THENCE N 89°21'50" E, ALONG THE SOUTH BOUNDARY THEREOF, 4827.92 FEET TO THE SOUTHWEST CORNER OF SAID SECTION 36, TOWNSHIP 37 SOUTH, RANGE 31 EAST; THENCE N 88°48'57" E, ALONG THE SOUTH BOUNDARY THEREOF, 2434.03 FEET; THENCE N 00°17'18" E 34.66 FEET TO THE WESTERLY LINE OF THAT CERTAIN BOUNDARY AGREEMENT RELATIVE TO CERTAIN UNSURVEYED LANDS AS RECORDED IN PLAT BOOK 14, PAGE 39, PUBLIC RECORDS OF SAID COUNTY; THENCE CONTINUE N 00°17'18" E, ALONG SAID WESTERLY LINE, 195.39 FEET TO THE POINT OF BEGINNING; THENCE N 88°48'24" E 572.26 FEET; THENCE N 84°58'31" E 293.09 FEET; THENCE N 88°49'23" E 2620.25 FEET; THENCE N 88°12'33" E 585.21 FEET; THENCE S 89°50'54" E 356.15 FEET; THENCE S 82°07'55" E 185.08 FEET; THENCE N 89°30'34" E 736.99 FEET; THENCE N 75°59'07" E 302.45 FEET; THENCE S 89°13'11" E 234.94 FEET; THENCE S 78°13'17" E 200.01 FEET; THENCE N 89°38'48" E 1916.75 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "A"; THENCE CONTINUE N 89°38'48" E 2764.69 FEET; THENCE N 80°04'57" E 249.19 FEET; THENCE N 89°37'20" E 1805.44 FEET; THENCE S 83°27'33" E 559.42 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "B"; THENCE N 89°49'09" E 711.97 FEET; THENCE N 78°02'52" E 328.96 FEET; THENCE S 89°57'08" E 2110.55 FEET; THENCE S 77°57'08" E 194.24 FEET; THENCE N 89°52'35" E 2039.94 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "C"; THENCE N 81°38'20" E 254.37 FEET; THENCE N 74°41'10" E 271.95 FEET; THENCE N 68°33'45" E 319.07 FEET; THENCE N 62°05'03" E 313.77 FEET; THENCE N 55°00'24" E 334.78 FEET; THENCE N 53°36'58" E 3717.28 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "D"; THENCE CONTINUE N 53°36'58" E 965.90 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "E"; THENCE N 52°23'23" E 1431.18 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "F"; THENCE N 65°35'12" E 39.95 FEET; THENCE N 78°31'50" E 39.88 FEET; THENCE S 87°47'14" E 143.33 FEET; THENCE N 79°26'00" E 40.13 FEET; THENCE N 65°49'16" E 40.51 FEET; THENCE N 53°06'41" E 46.15 FEET; THENCE N 53°46'48" E 980.23 FEET; THENCE N 43°54'35" E 40.02 FEET; THENCE N 33°50'50" E 271.37 FEET; THENCE N 25°13'25" E 40.00 FEET; THENCE N 16°35'58" E 40.00 FEET; THENCE N 07°58'34" E 40.00 FEET; THENCE N 00°38'26" W 270.21 FEET; THENCE N 89°59'56" E 333.22 FEET; THENCE S 80°45'08" E 153.99 FEET; THENCE S 89°57'34" E 40.00 FEET; THENCE N 80°50'00" E 40.00 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "G"; THENCE N 71°37'34" E 214.07 FEET; THENCE N 62°52'38" E 39.97 FEET; THENCE N 54°08'25" E 399.72 FEET; THENCE N 54°00'15" E 199.30 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "H"; THENCE N 50°22'17" E 581.27 FEET; THENCE N 53°59'27" E 370.53 FEET; THENCE N 51°21'50" E 316.15 FEET; THENCE N 42°06'15" E 40.00 FEET; THENCE N 32°50'39" E 40.00 FEET; THENCE N 23°35'04" E 180.29 FEET; THENCE N 33°35'04" E 40.00 FEET; THENCE N 43°35'03" E 40.00 FEET; THENCE N 53°35'12" E 1321.15 FEET; THENCE N 41°34'14" E 376.83 FEET TO A POINT HEREINAFTER REFERRED TO AS POINT "I"; THENCE N 53°49'36" E 592.45 FEET TO THE WESTERLY RIGHT OF WAY LINE OF SOUTH FLORIDA WATER MANAGEMENT DISTRICT CANAL C–41 A, AS DESCRIBED IN OFFICIAL RECORDS BOOK 115, PAGE 458, PUBLIC RECORDS OF SAID COUNTY AND THE TERMINUS OF SAID CENTERLINE. THE SIDELINES OF SAID EASEMENT ARE TO BE EXTENDED OR SHORTENED TO MEET AT ANGLE POINTS AND TO TERMINATE IN THE WESTERLY LINE OF THAT CERTAIN BOUNDARY AGREEMENT RELATIVE TO CERTAIN UNSURVEYED LANDS AS RECORDED IN PLAT BOOK 14, PAGE 39, PUBLIC RECORDS OF SAID COUNTY AND THE WESTERLY RIGHT OF WAY LINE OF SOUTH FLORIDA WATER MANAGEMENT DISTRICT CANAL C–41 A, AS DESCRIBED IN OFFICIAL RECORDS BOOK 115, PAGE 458, PUBLIC RECORDS OF SAID COUNTY, LESS THAT PORTION LYING WITHIN RIGHT OF WAY FOR STATE ROAD 70.
CONTAINING 38.713 ACRES (1,686,325 SQUARE FEET), MORE OR LESS.

F.G.T. TRACT Nos.

FL–HIGH–099
FL–HIGH–100
FL–HIGH–102
FL–HIGH–103
FL–HIGH–111
FL–HIGH–112
FL–HIGH–113
FL–HIGH–115

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE – HOUSTON, TEXAS 77081
PHONE: (713) 977–7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS–BUILT	SJC	04/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=100'		

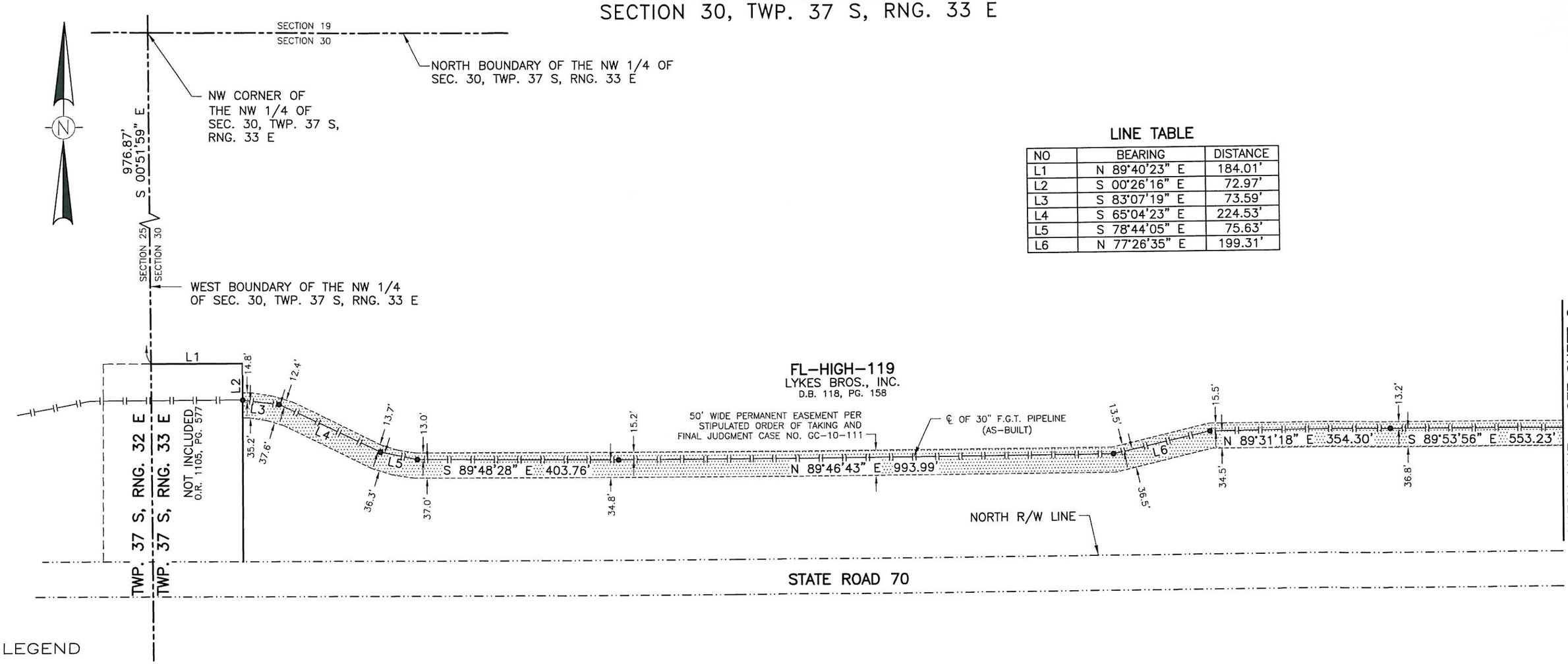
Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS–BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL–HIGH–099,100,102, 103,111,112,113,115AB
SHT. 22 OF 22
0

HIGHLANDS COUNTY, FLORIDA

SECTION 30, TWP. 37 S, RNG. 33 E



LINE TABLE

NO	BEARING	DISTANCE
L1	N 89°40'23" E	184.01'
L2	S 00°26'16" E	72.97'
L3	S 83°07'19" E	73.59'
L4	S 65°04'23" E	224.53'
L5	S 78°44'05" E	75.63'
L6	N 77°26'35" E	199.31'

LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
	=	PERMANENT EASEMENT

SAM J. COOPER III
PROFESSIONAL LAND SURVEYOR
FLORIDA REGISTRATION NUMBER 4900
NOT VALID WITHOUT SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

NOTES:

1. *BEARINGS SHOWN HEREON ARE BASED ON THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983 WITH THE WEST BOUNDARY OF THE NORTHWEST 1/4 OF SECTION 30, TOWNSHIP 37 SOUTH, RANGE 33 EAST, AS SHOWN, BEING S 00°51'59" E.*
2. *LAST DATE OF AS-BUILT SURVEY: 03/2011.*

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE - HOUSTON, TEXAS 77081
PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS-BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.		
CONSTRUCTION YR	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=200'		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

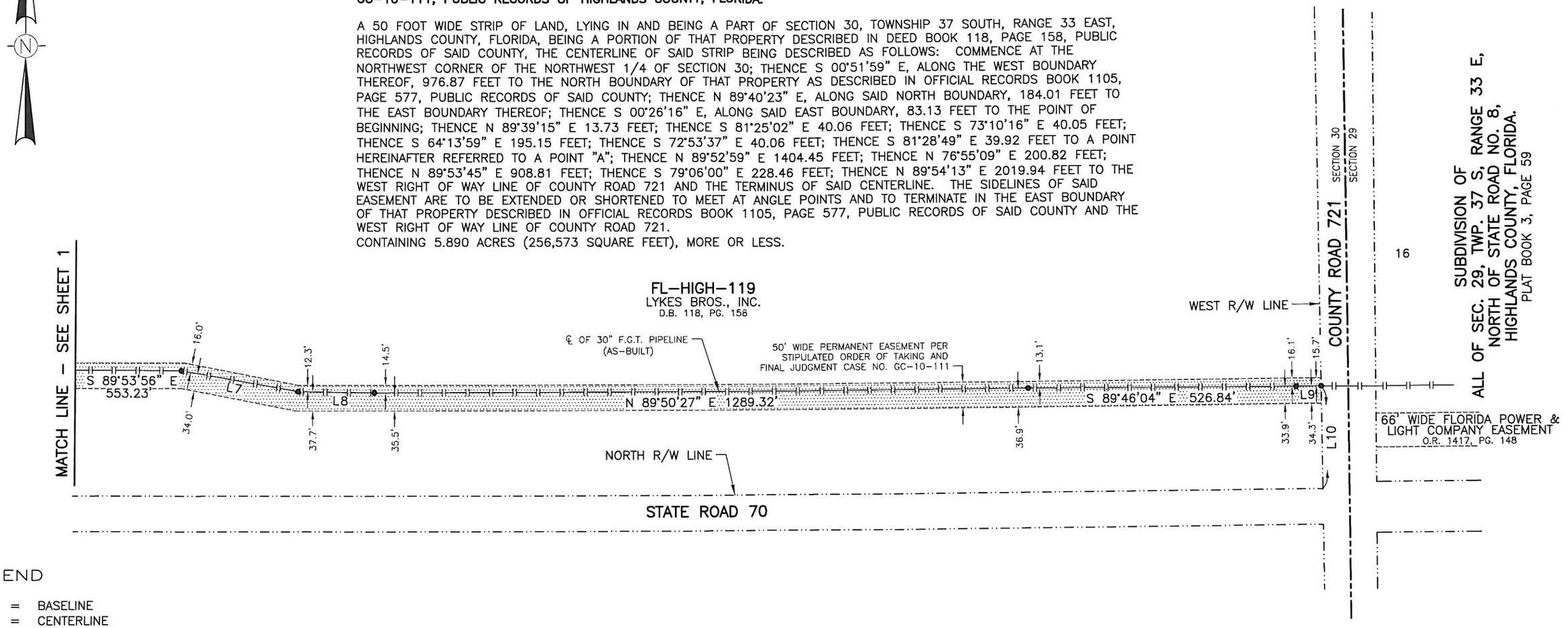
AS-BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL-HIGH-119AB
SHT. 1 OF 2
0

HIGHLANDS COUNTY, FLORIDA
SECTION 30, TWP. 37 S, RNG. 33 E

PERMANENT EASEMENT OF RECORD AS DESCRIBED IN STIPULATED ORDER OF TAKING AND FINAL JUDGMENT CASE NO. GC-10-111, PUBLIC RECORDS OF HIGHLANDS COUNTY, FLORIDA.

A 50 FOOT WIDE STRIP OF LAND, LYING IN AND BEING A PART OF SECTION 30, TOWNSHIP 37 SOUTH, RANGE 33 EAST, HIGHLANDS COUNTY, FLORIDA, BEING A PORTION OF THAT PROPERTY DESCRIBED IN DEED BOOK 118, PAGE 158, PUBLIC RECORDS OF SAID COUNTY, THE CENTERLINE OF SAID STRIP BEING DESCRIBED AS FOLLOWS: COMMENCE AT THE NORTHWEST CORNER OF THE NORTHWEST 1/4 OF SECTION 30; THENCE S 00°51'59" E, ALONG THE WEST BOUNDARY THEREOF, 976.87 FEET TO THE NORTH BOUNDARY OF THAT PROPERTY AS DESCRIBED IN OFFICIAL RECORDS BOOK 1105, PAGE 577, PUBLIC RECORDS OF SAID COUNTY; THENCE N 89°40'23" E, ALONG SAID NORTH BOUNDARY, 184.01 FEET TO THE EAST BOUNDARY THEREOF; THENCE S 00°26'16" E, ALONG SAID EAST BOUNDARY, 83.13 FEET TO THE POINT OF BEGINNING; THENCE N 89°39'15" E 13.73 FEET; THENCE S 81°25'02" E 40.06 FEET; THENCE S 73°10'16" E 40.05 FEET; THENCE S 64°13'59" E 195.15 FEET; THENCE S 72°53'37" E 40.06 FEET; THENCE S 81°28'49" E 39.92 FEET TO A POINT HEREINAFTER REFERRED TO A POINT "A"; THENCE N 89°52'59" E 1404.45 FEET; THENCE N 76°55'09" E 200.82 FEET; THENCE N 89°53'45" E 908.81 FEET; THENCE S 79°06'00" E 228.46 FEET; THENCE N 89°54'13" E 2019.94 FEET TO THE WEST RIGHT OF WAY LINE OF COUNTY ROAD 721 AND THE TERMINUS OF SAID CENTERLINE. THE SIDELINES OF SAID EASEMENT ARE TO BE EXTENDED OR SHORTENED TO MEET AT ANGLE POINTS AND TO TERMINATE IN THE EAST BOUNDARY OF THAT PROPERTY DESCRIBED IN OFFICIAL RECORDS BOOK 1105, PAGE 577, PUBLIC RECORDS OF SAID COUNTY AND THE WEST RIGHT OF WAY LINE OF COUNTY ROAD 721.
CONTAINING 5.890 ACRES (256,573 SQUARE FEET), MORE OR LESS.



LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
▒▒	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L7	S 80°04'52" E	234.04'
L8	S 89°15'31" E	150.85'
L9	N 89°26'23" E	50.19'
L10	S 00°18'35" E	201.27'

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE - HOUSTON, TEXAS 77081
PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS-BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

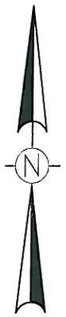
P.L./STA. ACCT. NO.		
CONSTRUCTION YR	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=200'		

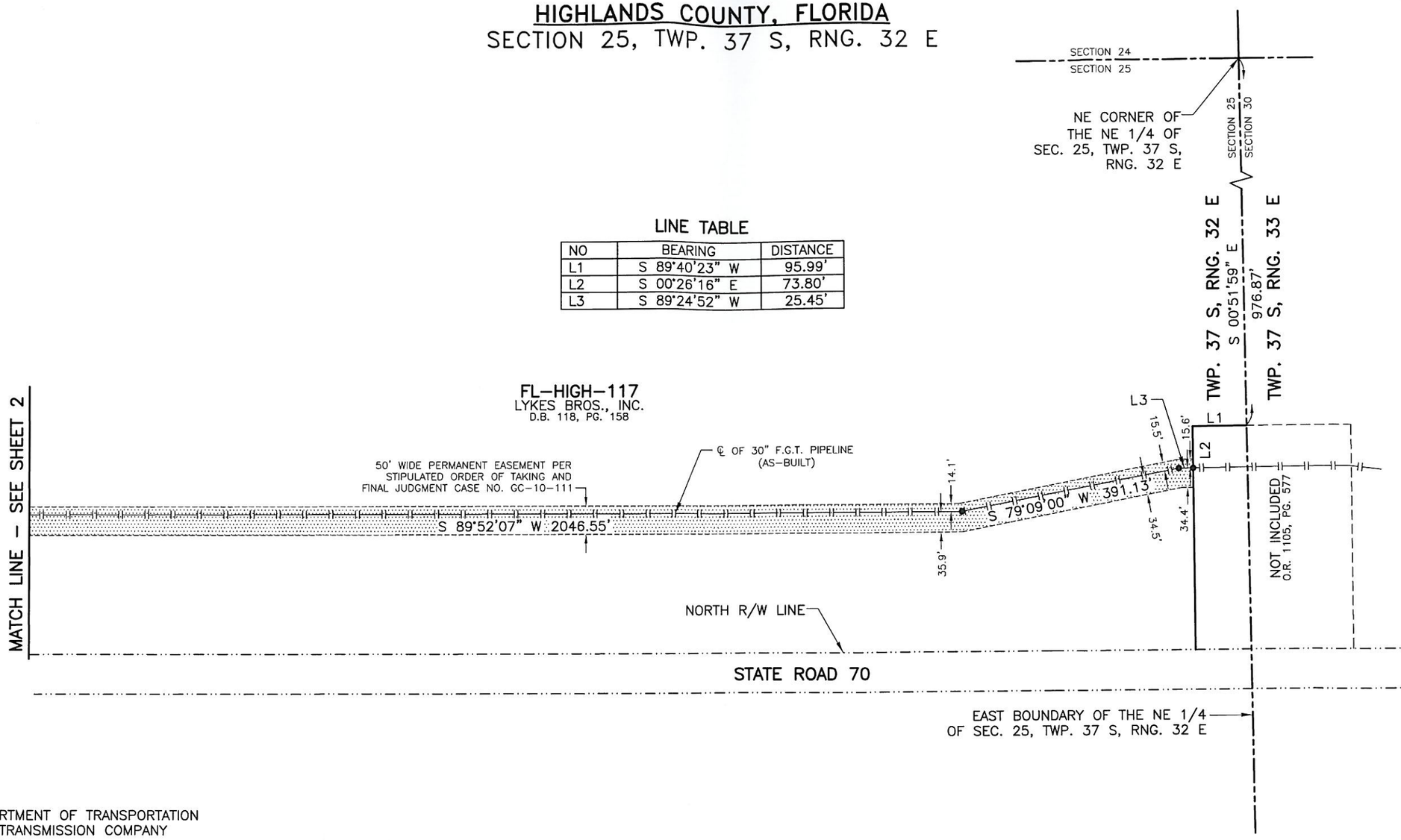
Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS-BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL-HIGH-119AB
SHT. 2 OF 2
0

HIGHLANDS COUNTY, FLORIDA
SECTION 25, TWP. 37 S, RNG. 32 E





LINE TABLE

NO	BEARING	DISTANCE
L1	S 89°40'23" W	95.99'
L2	S 00°26'16" E	73.80'
L3	S 89°24'52" W	25.45'

LEGEND

ℬ	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
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SAM J. COOPER III
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NOTES:

1. *BEARINGS SHOWN HEREON ARE BASED ON THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983 WITH THE EAST BOUNDARY OF THE NORTHEAST 1/4 OF SECTION 25, TOWNSHIP 37 SOUTH, RANGE 32 EAST, AS SHOWN, BEING S 00°51'59" E.*
2. *LAST DATE OF AS-BUILT SURVEY: 03/2011.*

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE - HOUSTON, TEXAS 77081
PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS-BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

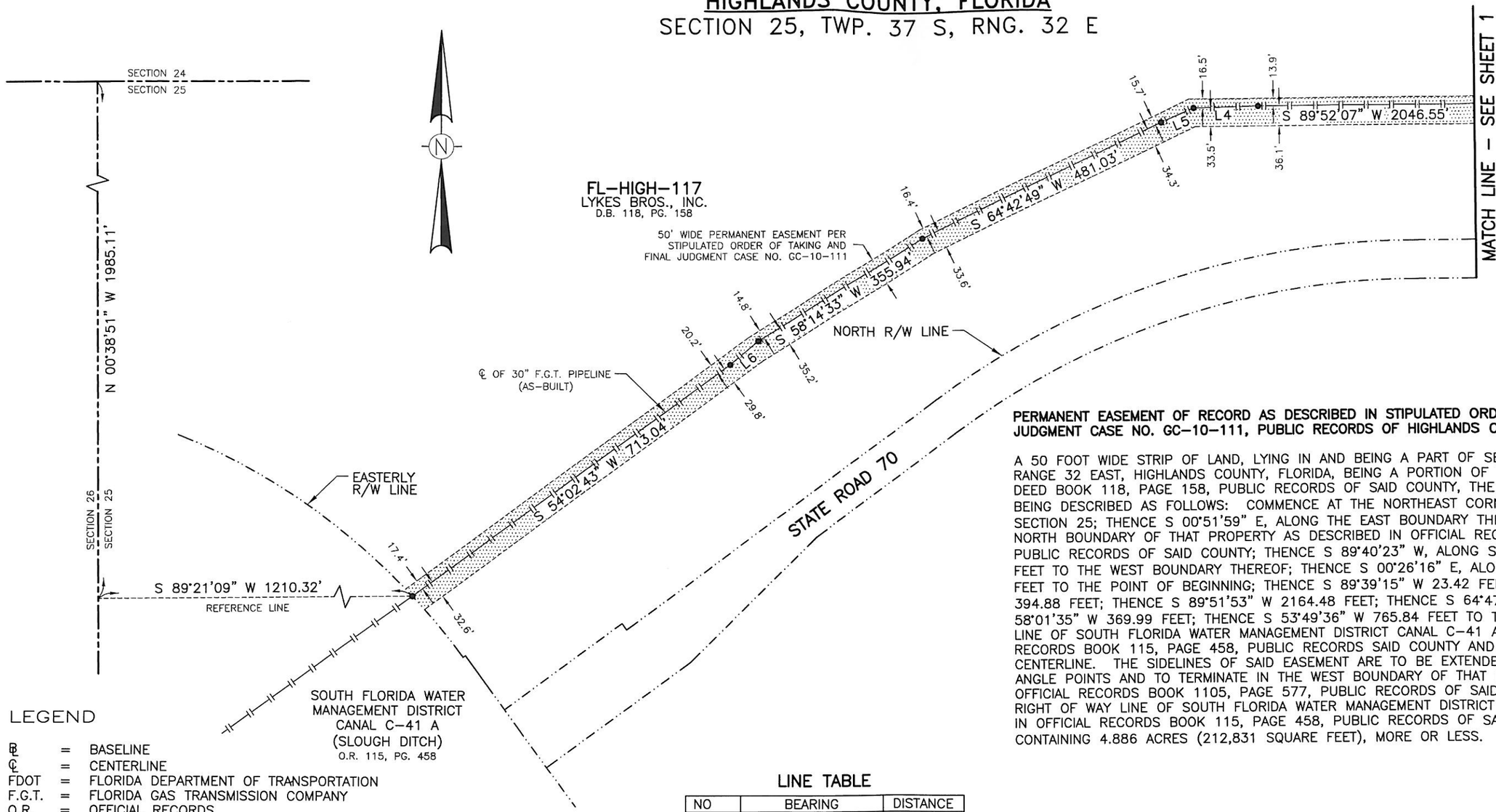
P.L./STA. ACCT. NO.		
CONSTRUCTION YR		
	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		
FILE NO.:		
SCALE: 1"=200'		

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS-BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO.
622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO.
FL-HIGH-117AB
SHT. 1 OF 2
0

HIGHLANDS COUNTY, FLORIDA
SECTION 25, TWP. 37 S, RNG. 32 E



LEGEND

℄	=	BASELINE
℄	=	CENTERLINE
FDOT	=	FLORIDA DEPARTMENT OF TRANSPORTATION
F.G.T.	=	FLORIDA GAS TRANSMISSION COMPANY
O.R.	=	OFFICIAL RECORDS
P.O.B.	=	POINT OF BEGINNING
P.O.C.	=	POINT OF COMMENCEMENT
SEC.	=	SECTION
TWP.	=	TOWNSHIP
RNG.	=	RANGE
R/W	=	RIGHT OF WAY
N.T.S.	=	NOT TO SCALE
▭	=	PERMANENT EASEMENT

LINE TABLE

NO	BEARING	DISTANCE
L4	S 88°35'26" W	117.13'
L5	S 67°03'02" W	65.30'
L6	S 50°04'10" W	66.95'

PERMANENT EASEMENT OF RECORD AS DESCRIBED IN STIPULATED ORDER OF TAKING AND FINAL JUDGMENT CASE NO. GC-10-111, PUBLIC RECORDS OF HIGHLANDS COUNTY, FLORIDA.

A 50 FOOT WIDE STRIP OF LAND, LYING IN AND BEING A PART OF SECTION 25, TOWNSHIP 37 SOUTH, RANGE 32 EAST, HIGHLANDS COUNTY, FLORIDA, BEING A PORTION OF THAT PROPERTY DESCRIBED IN DEED BOOK 118, PAGE 158, PUBLIC RECORDS OF SAID COUNTY, THE CENTERLINE OF SAID STRIP BEING DESCRIBED AS FOLLOWS: COMMENCE AT THE NORTHEAST CORNER OF NORTHEAST 1/4 OF SECTION 25; THENCE S 00°51'59" E, ALONG THE EAST BOUNDARY THEREOF, 976.87 FEET TO THE NORTH BOUNDARY OF THAT PROPERTY AS DESCRIBED IN OFFICIAL RECORDS BOOK 1105, PAGE 577, PUBLIC RECORDS OF SAID COUNTY; THENCE S 89°40'23" W, ALONG SAID NORTH BOUNDARY, 95.99 FEET TO THE WEST BOUNDARY THEREOF; THENCE S 00°26'16" E, ALONG SAID WEST BOUNDARY, 83.23 FEET TO THE POINT OF BEGINNING; THENCE S 89°39'15" W 23.42 FEET; THENCE S 79°00'50" W 394.88 FEET; THENCE S 89°51'53" W 2164.48 FEET; THENCE S 64°47'54" W 537.94 FEET; THENCE S 58°01'35" W 369.99 FEET; THENCE S 53°49'36" W 765.84 FEET TO THE EASTERLY RIGHT OF WAY LINE OF SOUTH FLORIDA WATER MANAGEMENT DISTRICT CANAL C-41 A AS DESCRIBED IN OFFICIAL RECORDS BOOK 115, PAGE 458, PUBLIC RECORDS SAID COUNTY AND THE TERMINUS OF SAID CENTERLINE. THE SIDELINES OF SAID EASEMENT ARE TO BE EXTENDED OR SHORTENED TO MEET AT ANGLE POINTS AND TO TERMINATE IN THE WEST BOUNDARY OF THAT PROPERTY AS DESCRIBED IN OFFICIAL RECORDS BOOK 1105, PAGE 577, PUBLIC RECORDS OF SAID COUNTY AND THE EASTERLY RIGHT OF WAY LINE OF SOUTH FLORIDA WATER MANAGEMENT DISTRICT CANAL C-41 A AS DESCRIBED IN OFFICIAL RECORDS BOOK 115, PAGE 458, PUBLIC RECORDS OF SAID COUNTY.
CONTAINING 4.886 ACRES (212,831 SQUARE FEET), MORE OR LESS.

PREPARED BY
UNIVERSAL ENSCO, INC.
4848 LOOP CENTRAL DRIVE - HOUSTON, TEXAS 77081
PHONE: (713) 977-7770
FLORIDA CERTIFICATE OF AUTHORIZATION NUMBER 6186

REV.	DESCRIPTION	BY	DATE	APPR.
0	ISSUE AS-BUILT	SJC	4/14/11	

DWG. STATUS	CHECKED BY	CHECKED DATE	APPROVED BY	APPROVED DATE
PRELIM				
BID				
CONST.				
PLOT DATE				
FILE NAME				

P.L./STA. ACCT. NO.

CONSTRUCTION YR

	BY	DATE
SURVEY	TT	03/2011
DRAWN	RM	04/2011
ASBUILT		

FILE NO.:
SCALE: 1"=200'

Florida Gas Transmission Company
A Southern Union/El Paso Affiliate
HOUSTON, TEXAS

AS-BUILT SURVEY OF
30" GAS PIPELINE
ON THE PROPERTY OF
LYKES BROS., INC.
HIGHLANDS COUNTY, FLORIDA

PROJECT NO. 622012
PREVIOUS DWG. NO.
SHT. OF
DWG. NO. FL-HIGH-117AB
SHT. 2 OF 2
0

ANNEX C-3

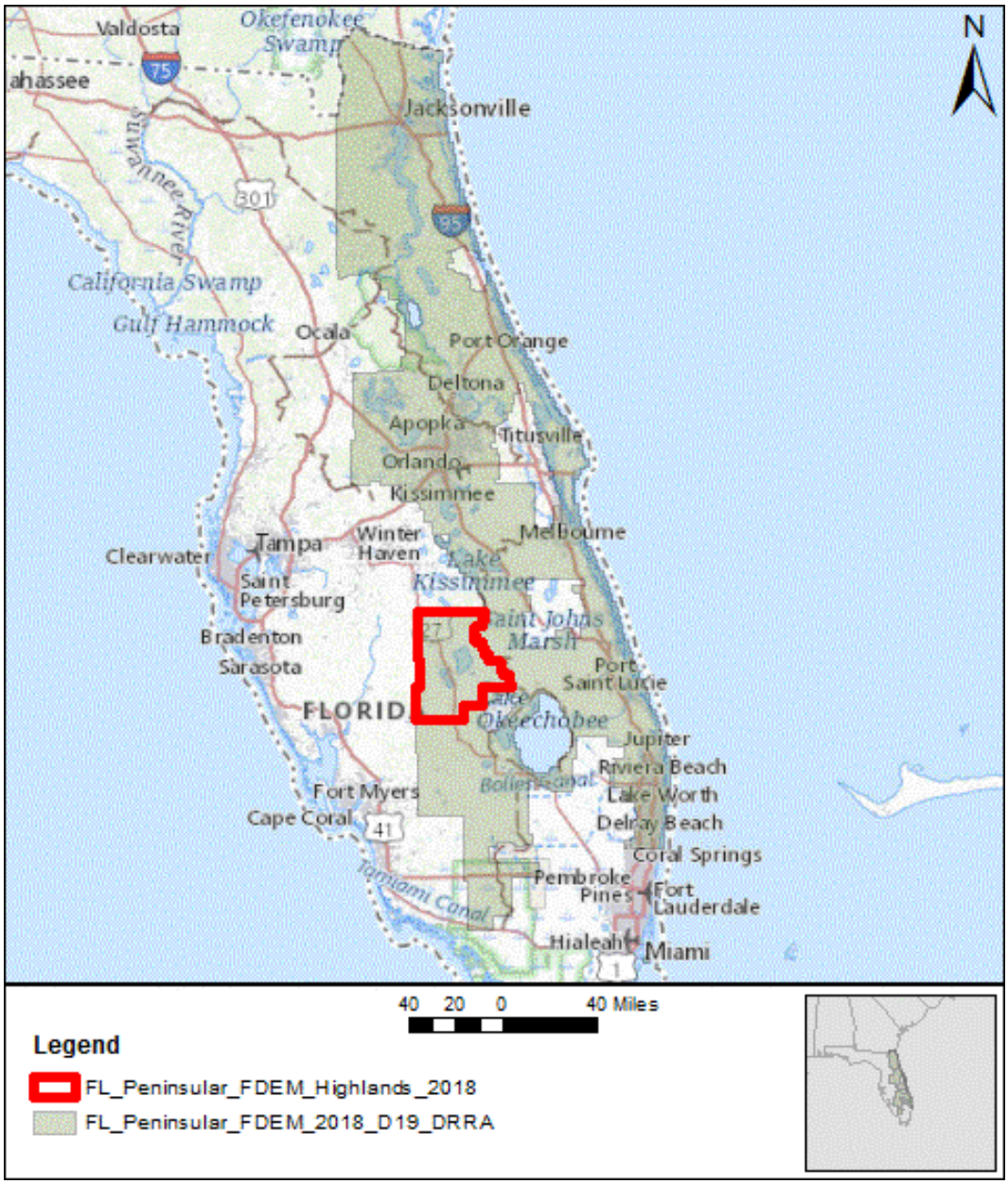
Documentation for Highlands County 2018 LiDAR DEM Dataset

Data Validation Report

from the National Geospatial Technical Operations Center in Support of the 3D Elevation Program

FL_Peninsular_FDEM_Highlands_2018

2022-07-29



Project Name: FL_Peninsular_FDEM_2018_D19_DRRA

Report Date: 2022-07-29

Based on this review, the delivered data is **EXPECTED TO MEET** 3D Elevation Program requirements.

Work Unit Summary Information

Project Name: FL_Peninsular_FDEM_2018_D19_DRRA	**Project ID:** 81112	
WU Name: FL_Peninsular_FDEM_Highlands_2018	**Work Unit ID:** 221185	
Mechanism: GPSC	**Lidar Base Spec:** 1.3	
Quality Level: 1	**P-Method:** 7 - Linear-Mode Lidar	
Horizontal EPSG Code: 6438	**Vertical EPSG Code:** 6360	**Geoid Model:** GEOID 12B
The National Map Help Desk Email: tnm_help@usgs.gov		

The U.S. Geological Survey evaluates absolute vertical accuracy of the lidar and lidar-derived bare earth digital elevation model (DEM) data at the project level. Data are produced to meet 9.8 cm absolute vertical accuracy at the 95-percent confidence level in non-vegetated, open terrain. To review vertical accuracy results, please see the project report

Breaklines

Based on this Review, the USGS-NGTOC **ACCEPTS** the Breaklines

Breaklines are visually reviewed in conjunction with the bare earth DEM for spatial and geometric accuracy. Breaklines are confirmed to be three dimensional (3D) features and that elevations are at or just below the immediately surrounding terrain. Single- and double-line drainages are reviewed to ensure downstream flow. The USGS recognizes that differences in collection methodology, resampling techniques, and other factors that are unique to proprietary production do occur, and these will result in minor horizontal and vertical differences between breaklines derived on the fly.

Reporting Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Reporting Metadata

Reports from the contractor, including calibration, collection, and processing methods, are reviewed for accurate information. For more information, please see the work units metadata.

FGDC XML Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the FGDC XML Metadata

CSGDM .xml metadata are parsed using the USGS Geospatial Metadata Validation Service and reviewed for accurate information. CSDGM is maintained by the Federal Geographic Data Committee (FGDC).

Spatial Metadata

Based on this Review, the USGS-NGTOC **ACCEPTS** the Spatial Metadata

Spatial metadata from the contractor, including raster and vector datasets, are evaluated together with pertinent deliverables for geometric fidelity and attribution accuracy. For more information, please see the work units metadata.

DEM

Based on this Review, the USGS-NGTOC **ACCEPTS** the DEM

Visual review is performed on .tif bare earth rasters at a 1:5,000 or larger viewing scale to validate point cloud geometry, raster processing methodology, point classification, and breaklines. Comprehensive review is completed to ensure consistency and accuracy across all files. For additional information, please see this work units metadata folder.

Pointcloud

Based on this Review, the USGS-NGTOC **ACCEPTS** the Pointcloud

Visual and statistical review is performed on classified .las files to validate adherence to contracted specifications. A comprehensive review is completed to ensure consistency and accuracy across all files, including the spatial reference system. Classification verification is limited to the minimum required by applicable Lidar Base Specification. Classifications beyond the minimum are not verified by USGS. LAS files are evaluated to ensure the public header block, point data records, and variable/extended variable length records are correctly populated. For additional information, please see the work units metadata folder.

Dewberry Engineers Inc.
1000 North Ashley Drive, Suite 801
Tampa, FL 33602

813.225.1325
813.225.1385 fax
www.dewberry.com

FL Peninsular 2018 Lidar Project- Highlands County

Report Produced for U.S. Geological Survey

USGS Contract: G16PC00020

Report Date: July 13, 2021

SUBMITTED BY:
Dewberry
1000 North Ashley Drive Suite 801
Tampa, FL 33602
813.225.1325

SUBMITTED TO:
U.S. Geological Survey
1400 Independence Road
Rolla, MO 65401
573.308.3810

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ATTACHMENTS

Appendix A: GPS Processing Reports

Appendix B: GPS Processing Reports

1. EXECUTIVE SUMMARY

The primary purpose of this project was to develop a consistent and accurate surface elevation dataset derived from high-accuracy light detection and ranging (lidar) technology for the FL Peninsular Lidar Project- Highlands County project area.

Lidar data were processed and classified according to project specifications. Detailed breaklines and bare-earth Digital Elevation Models were produced for the project area. Project components were formatted based on a tile grid with each tile covering an area 5,000 ft by 5,000 ft. A total of 39,185 tiles will be produced for the project, providing approximately 34,911 sq. miles of coverage. A total of 1,171 tiles were produced for Highlands County, providing approximately 1,050 sq. miles of coverage.

1.1 Project Team

Dewberry served as the prime contractor for the project. Woolpert was responsible for LAS classification, all lidar products, breakline production, and digital elevation model (DEM) production. Dewberry was responsible for project management and quality assurance.

Woolpert completed the ground survey for the project and delivered surveyed checkpoints. The task was to acquire surveyed checkpoints for the project to use in independent testing of the vertical accuracy of the lidar-derived surface model and to acquire surveyed ground control points for use in calibration activities. The GPS base station coordinates used during lidar data acquisition were verified.

Woolpert and Leading Edge Geomatics completed lidar data acquisition and data calibration for the project area.

1.2 Project Area

The block area is shown in figure 1. Highlands County contains 1,171 5,000 ft by 5,000 ft tiles. The project tile grid contains 39,185 5,000 ft by 5,000 ft tiles.

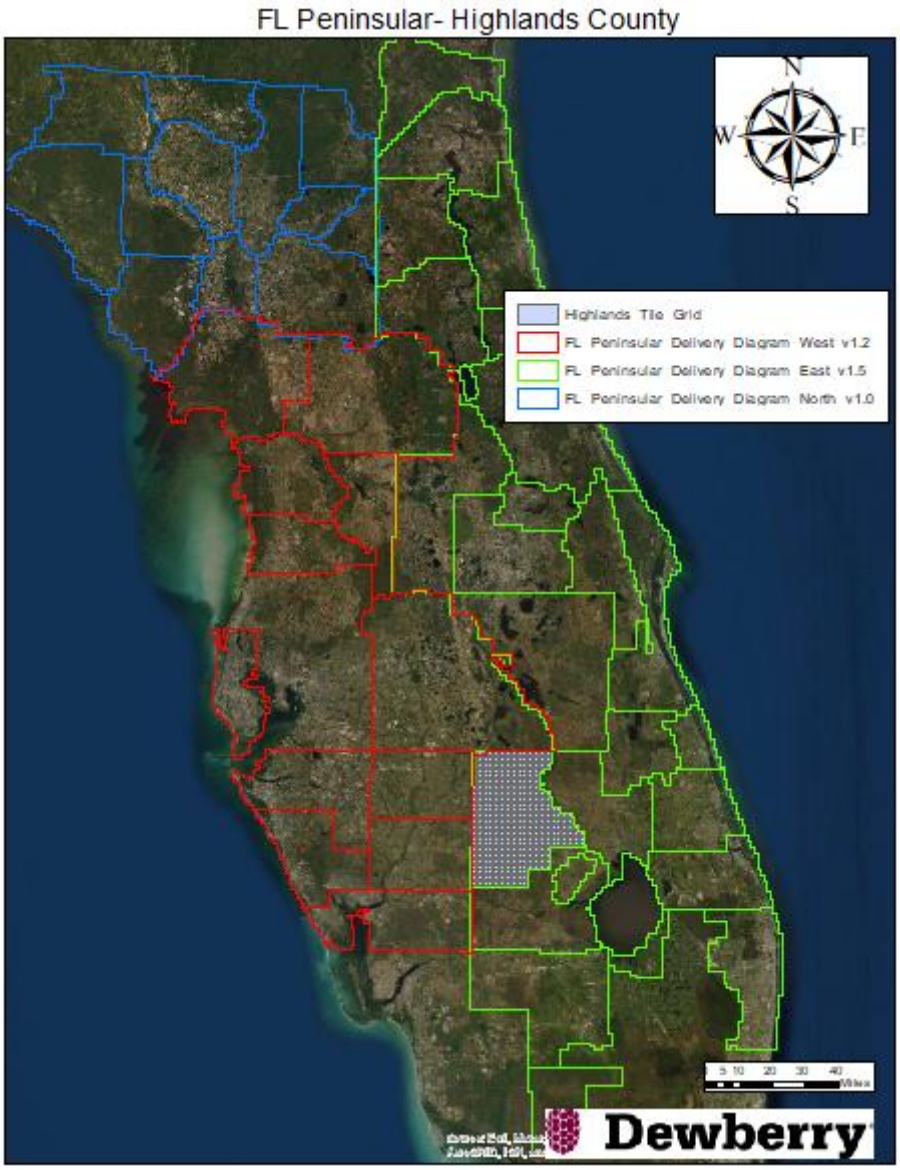

Figure 1. Project map and tile grid.

1.3 Coordinate Reference System

Data produced for the project are delivered in the following spatial reference system:

Horizontal Datum:	North American Datum of 1983 with the 2011 Adjustment (NAD 83 (2011))
Vertical Datum:	North American Vertical Datum of 1988 (NAVD88)
Geoid Model:	Geoid12B
Coordinate System:	FL State Plane Zone East
Horizontal Units:	U.S. Survey Feet
Vertical Units:	U.S. Survey Feet

1.4 Project Deliverables

The deliverables for the block are as follows:

1. Project Extents (Esri SHP)
2. Calibration Points (coordinates, Esri shapefile)
3. Classified Point Cloud (tiled LAS)
4. Independent Survey Checkpoint Data (report, photos, coordinates, Esri shapefiles)
5. Intensity Images (tiled, 8-bit gray scale, GeoTIFF format)
6. Breakline Data (file GDB)
7. Bare Earth Surface (tiled raster DEM, GeoTIFF format)
8. Interswath Raster
9. Interswath Polygons
10. DZ Orthos- (GeoTIFF format)
11. Intraswath Polygons
12. Metadata (XML)
13. Block Report

2. LIDAR ACQUISITION REPORT

Dewberry elected to subcontract the lidar acquisition and calibration activities to Woolpert and Leading Edge Geomatics. Woolpert and Leading Edge Geomatics was responsible for providing lidar acquisition, calibration, and delivery of lidar data files.

The lidar aerial acquisition for Highlands County by Woolpert was conducted between December 06, 2018 to January 6, 2020.

2.1 Lidar Acquisition Details- Woolpert

Woolpert planned 580 passes for the project area as a series of parallel flight lines with cross flight lines for the purposes of quality control. The flight plan included zigzag flight line collection as a result of the inherent IMU drift associated with all IMU systems. In order to reduce any margin for error in the flight plan, Woolpert followed FEMA’s Appendix A “guidelines” for flight planning and, at a minimum, includes the following criteria:

- A digital flight line layout using Leica Mission Pro flight design software for direct integration into the aircraft flight navigation system;
- Planned flight lines, flight line numbers, and coverage area;
- Lidar coverage extended by a predetermined margin beyond all project borders to ensure necessary over-edge coverage appropriate for specific task order deliverables;
- Investigation of local restrictions related to air space and any controlled areas so that required permissions can be obtained in a timely manner with respect to project schedule; and
- Filed flight plans as required by local Air Traffic Control (ATC) prior to each mission.

Woolpert monitored weather and atmospheric conditions and conducted lidar missions only when no conditions existed below the sensor that would affect the collection of data. Good lidar collection conditions include leaf-off for hardwoods and no snow, rain, fog, smoke, mist, or low clouds. Lidar systems are active sensors that do not require active light, thus allowing missions to be conducted during night hours if weather restrictions do not

prevent collection. Woolpert accessed reliable weather sites and indicators (webcams) to establish the highest probability for successful data acquisition.

Within 72 hours prior to the planned day(s) of acquisition, Woolpert closely monitored the weather, checking all sources for forecasts at least twice daily. As soon as weather conditions were conducive to acquisition, aircraft mobilized to the project site to begin data collection. Once on site, the acquisition team took responsibility for weather analysis.

2.2 Lidar Acquisition Details- Leading Edge Geomatics

Leading Edge Geomatics lidar sensors are calibrated at designated sites in the United States and are periodically checked and adjusted to minimize corrections at project sites.

Leading Edge Geomatics planned 162 passes for the project area as a series of parallel flight lines with cross flight lines for the purposes of quality control. The flight plan included zigzag flight line collection as a result of the inherent IMU drift associated with all IMU systems. In order to reduce any margin for error in the flight plan, Leading Edge Geomatics followed FEMA’s Appendix A “guidelines” for flight planning and, at a minimum, includes the following criteria:

- A digital flight line layout using Track Air flight design software for direct integration into the aircraft flight navigation system;
- Planned flight lines, flight line numbers, and coverage area;
- Lidar coverage extended by a predetermined margin beyond all project borders to ensure necessary over-edge coverage appropriate for specific task order deliverables;
- Investigation of local restrictions related to air space and any controlled areas so that required permissions can be obtained in a timely manner with respect to project schedule; and
- Filed flight plans as required by local Air Traffic Control (ATC) prior to each mission.

Leading Edge Geomatics monitored weather and atmospheric conditions and conducted lidar missions only when no conditions existed below the sensor that would affect the collection of data. Good lidar collection conditions include leaf-off for hardwoods and no snow, rain, fog, smoke, mist, or low clouds. Lidar systems are active sensors that do not require active light, thus allowing missions to be conducted during night hours if weather restrictions do not prevent collection. Leading Edge Geomatics accessed reliable weather sites and indicators (webcams) to establish the highest probability for successful data acquisition.

Within 72 hours prior to the planned day(s) of acquisition, Leading Edge Geomatics closely monitored the weather, checking all sources for forecasts at least twice daily. As soon as weather conditions were conducive to acquisition, aircraft mobilized to the project site to begin data collection. Once on site, the acquisition team took responsibility for weather analysis.

2.3 Lidar System Parameters- Woolpert

Woolpert operated a Cessna 404 Titan (Tail # N404CP) and a Reims 406 (Tail#N406SD) outfitted with a Leica Terrain Mapper lidar system during data collection. Table 1 details the lidar system parameters used during acquisition for this project.

Table 1. Woolpert lidar system parameters.

Parameter	Value
System	Leica Terrain Mapper
Altitude (m above ground level)	2438
Nominal flight speed (kts)	140
Scanner pulse rate (kHz)	30
Scan frequency (Hz)	150
Pulse duration of the scanner (ns)	2.5
Pulse width of the scanner (m)	0.57
Central wavelength of the sensor laser (nm)	1064
Multiple pulses in the air	Yes
Beam divergence (mrad)	0.25
Swath width (m)	1140
Nominal swath width on the ground (m)	1140
Swath overlap (%)	27
Total sensor scan angle (degrees)	40
Computed down track spacing per beam (m)	0.43
Computed cross track Spacing per beam (m)	0.42
Nominal pulse spacing (NPS) (single swath) (m)	0.31
Nominal Pulse Density (NPD) (single swath) (points per sq m)	10.1
Aggregate NPS (m) (if NPS was designed to be met through single coverage, ANPS and NPS will be equal)	0.31
Aggregate NPD (m) (if NPD was designed to be met through single coverage, ANPD and NPD will be equal)	10.1
Maximum Number of Returns per Pulse	15

2.4 Lidar System Parameters- Leading Edge Geomatics

Leading Edge Geomatics operated three aircraft, each equipped with a Riegl VQ-1560i laser lidar system during data collection. Table 2 details the lidar system parameters used during acquisition for all three sensors used for this project.

Table 2. Leading Edge Geomatics lidar system parameters.

Parameter	Value
System	Riegl VQ-1560i
Altitude (m above ground level)	1300
Nominal flight speed (kts)	120
Scanner pulse rate (kHz)	2000
Scan frequency (Hz)	160
Pulse duration of the scanner (ns)	3
Pulse width of the scanner (m)	0.9
Central wavelength of the sensor laser (nm)	1064

Multiple pulses in the air	Yes
Beam divergence (mrad)	0.25
Swath width (m)	1400
Nominal swath width on the ground (m)	1400
Swath overlap (%)	20
Total sensor scan angle (degrees)	60
Computed down track spacing per beam (m)	0.37
Computed cross track Spacing per beam (m)	0.37
Nominal pulse spacing (NPS) (single swath) (m)	0.29
Nominal Pulse Density (NPD) (single swath) (points per sq m)	11.9
Aggregate NPS (m) (if NPS was designed to be met through single coverage, ANPS and NPS will be equal)	0.29
Aggregate NPD (m) (if NPD was designed to be met through single coverage, ANPD and NPD will be equal)	11.9
Maximum Number of Returns per Pulse	7

2.5 Acquisition Status Report and Flight Lines- Woolpert

Upon notification to proceed, the flight crew loaded the flight plans and validated the flight parameters. The acquisition manager contacted air traffic control and coordinated flight pattern requirements. Lidar acquisition began immediately upon notification that control base stations were in place. During flight operations, the flight crew monitored weather and atmospheric conditions. Lidar missions were flown only when no condition existed below the sensor that would affect the collection of data. The pilot constantly monitored the course, position, pitch, roll, and yaw of the aircraft. The sensor operator monitored the lidar sensor, the position dilution of precision (PDOP), and performed the first quality control review during acquisition. The flight crew reviewed weather and cloud locations. Any flight lines impacted by unfavorable conditions were marked as invalid and re-flown immediately or at an optimal time.

2.6 Acquisition Status Report and Flight Lines - Leading Edge Geomatics

Upon notification to proceed, the flight crew loaded the flight plans and validated the flight parameters. The acquisition manager contacted air traffic control and coordinated flight pattern requirements. Lidar acquisition began immediately upon notification that control base stations were in place. During flight operations, the flight crew monitored weather and atmospheric conditions. Lidar missions were flown only when no condition existed below the sensor that would affect the collection of data. The pilot constantly monitored the course, position, pitch, roll, and yaw of the aircraft. The sensor operator monitored the lidar sensor, the position dilution of precision (PDOP), and performed the first quality control review during acquisition. The flight crew reviewed weather and cloud locations. Any flight lines impacted by unfavorable conditions were marked as invalid and re-flown immediately or at an optimal time.

Figure 2 shows the combined flight line trajectories.

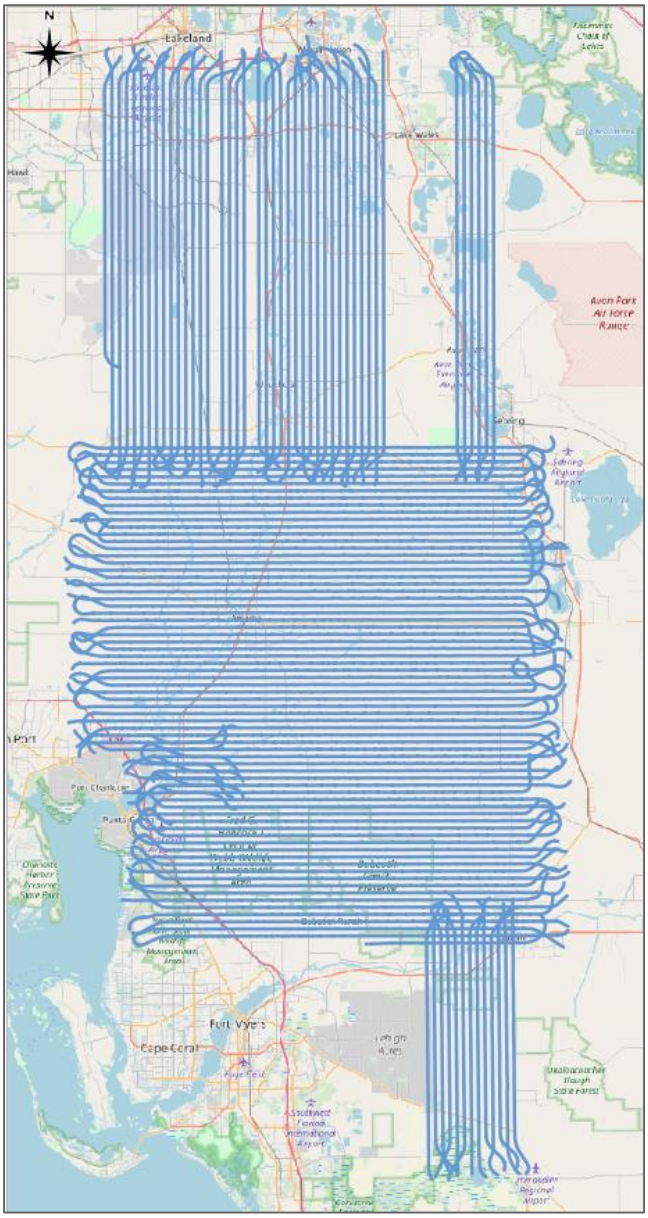

Figure 2. Trajectories of flight lines flown

2.7 Acquisition Static Control- Woolpert

Woolpert utilized FPRN and USGS CORS for the FL Peninsular lidar project area. The coordinates of all base stations used are provided in table 3. All control and calibration points are also provided in shapefile format as part of is delivery.

Table 3. Base stations used to control lidar acquisition.

Name	NAD83(2011) FL State Plane East, ft		NAD83(2011), ft Ellipsoid Height
	Easting (X)	Northing (Y)	
MTNT_CORS	686748.417	556914.051	-61.69
PBCH_CORS	910743.623	914080.222	-49.80
OKCB_CORS	703163.295	1065904.871	-44.73
NAPL_CORS	401512.547	660475.390	-56.89
FMYR_CORS	372945.191	821451.160	-43.17
CCV6_CORS	802211.306	1500205.242	-74.25
ORMD_CORS	621458.218	1804732.026	-59.79
FLWE_CORS	626424.425	1492936.628	-11.33
FMYR_CORS_ARP	373762.228	821445.635	-43.56

2.8 Acquisition Static Control- Leading Edge Geomatics

Leading Edge Geomatics utilized 22 permanent static GNSS CORS base stations for the FL Peninsular lidar project area. The coordinates of all base stations used are provided in table 4. All control and calibration points are also provided in shapefile format as part of is delivery.

Table 4. Base stations used to control lidar acquisition.

Name	NAD83(2011) FL State Plane West, ft		NAD83(2011), ft	NAVD88 Geoid12B, ft Orthometric Height
	Easting (X)	Northing (Y)	Ellipsoid Height	
CCV6	1502756.7	1123547.44	18.4	-22.7
DLND	1717517.94	891572.71	93.03	0.26
FMYR	820515.86	700558.13	35.7	-13.28
MCD5	1278477.27	484154.9	34.86	-14.17
MTNT	558398.95	1015584.6	17.7	-18.93
NAPL	659778.24	729553.24	19.87	-17.46
OKCB	1067579.57	1028027.57	42.21	-13.76
WACH	1156103.62	694286.02	117.21	10.72
ZEFR	1415483.53	603153.9	86.06	0.02
AVON	1185841.3	810004.54	156.52	21.78
FLCC	1367751.91	890171.93	92	0.34
FLD7	1321805.4	538656.81	40.39	-12.83
FLDC	1465759.4	595768.54	128.55	12.69
FLGR	1253011.34	603723.52	139.16	17.36
FLLP	1082035.6	862982.9	160.37	23.52
FLSI	778280.5	604221.13	21.05	-17.11
GSPS	1145619.72	542303.52	62.57	-5.65
HULK	1440285.17	837556.03	96.36	1.59
LAUD	681221.25	1255287.68	24.6	-18.14

Name	NAD83(2011) FL State Plane West, ft		NAD83(2011), ft	NAVD88 Geoid12B, ft Orthometric Height
	Easting (X)	Northing (Y)	Ellipsoid Height	
LBLL	877803.4	834543	25.89	-16.58
PBCH	917372.92	1236855.84	36.73	-15.3
RCDA	1049344.4	697069.44	40.91	-12.04

2.9 Airborne Kinematic Control- Woolpert

Airborne GNSS data was processed using the Applanix POSPac MMS software suite and Novatel's GrafNav software. Flights were flown with a minimum of six satellites in view (13° above the horizon) and with a PDOP of better than four. Distances from at least one base station to aircraft were kept to a maximum of 40 km (25 miles). For all flights, the GNSS data can be classified as excellent, with GNSS residuals of 3 cm average or better but no larger than 10 cm being recorded.

GPS processing reports for each mission are included in the Appendix A attachment.

2.10 Airborne Kinematic Control- Leading Edge Geomatics

Airborne GNSS data was processed using the Applanix POSPac MMS software suite and Novatel's GrafNav software. Flights were flown with a minimum of six satellites in view (13° above the horizon) and with a PDOP of better than four. Distances from at least one base station to aircraft were kept to a maximum of 40 km (25 miles). For all flights, the GNSS data can be classified as excellent, with GNSS residuals of 3 cm average or better but no larger than 10 cm being recorded.

GPS processing reports for each mission are included in the Appendix B attachment.

2.11 Generation and Calibration of Raw Lidar Data- Woolpert

Availability and status of all required GPS and laser data were verified against field reports and any data inconsistencies were addressed.

Subsequently the mission points were output using Leica software initially with default values from Leica or the last mission calibrated for the system. The initial point generation for each mission calibration was verified within Microstation/TerraScan for calibration errors. If a calibration error greater than specification was observed, the appropriate roll, pitch and scanner scale corrections were calculated. The point data were then regenerated with the new calibration values and validated internally again to ensure that the errors were fully addressed.

Data collected by the lidar unit was reviewed for completeness, acceptable density, and to make sure all data were captured without errors or corrupted values. All GPS, aircraft trajectory, mission information, and ground control files were reviewed and logged. A supplementary coverage check was carried out (Figure 3) to ensure that there were no unreported gaps in data coverage.

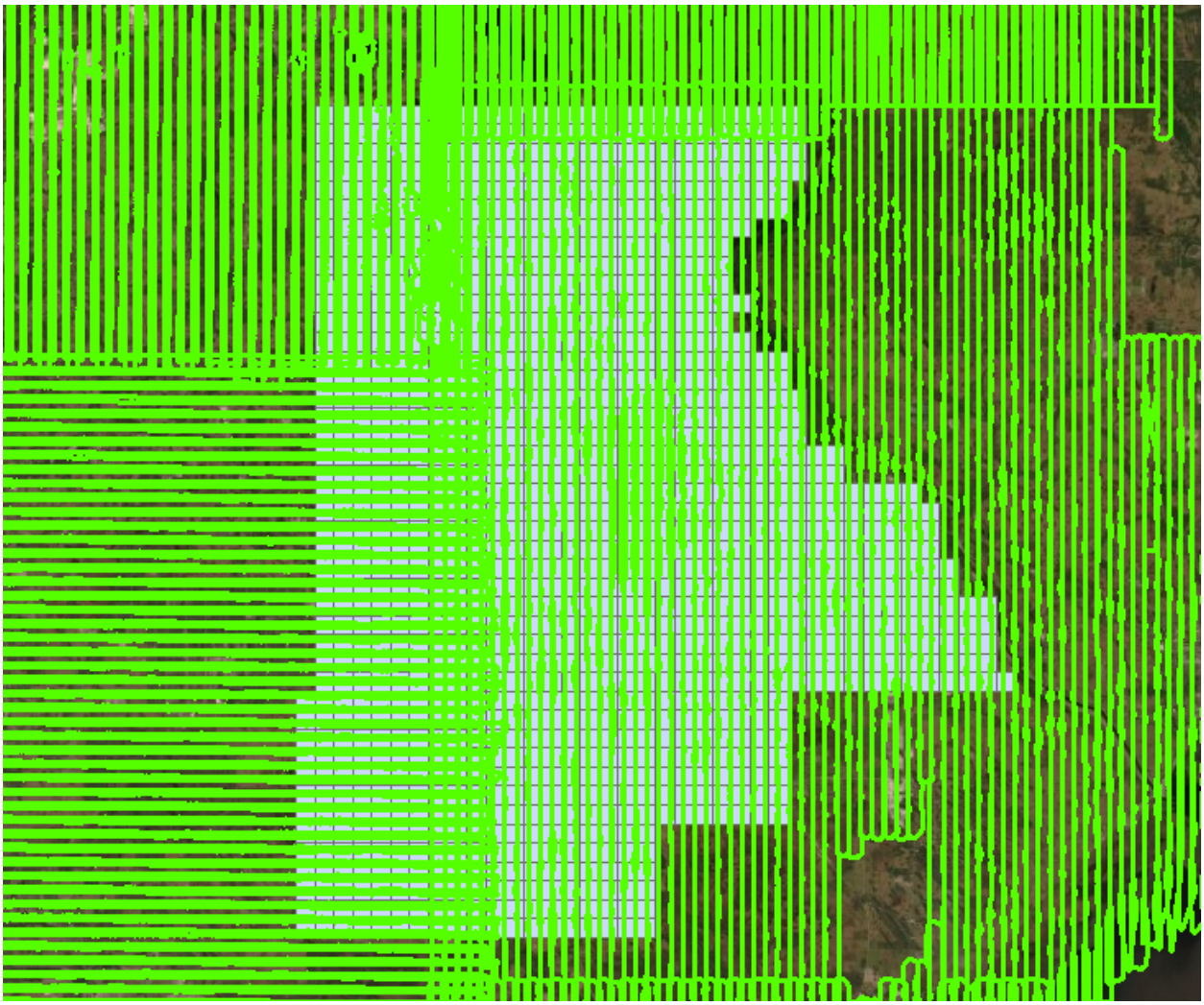

Figure 3. Lidar swath output showing complete coverage.

2.11.1 Boresight and Relative accuracy

The initial points for each mission calibration were inspected for flight line errors, flight line overlap, slivers or gaps in the data, point data minimums, or issues with the lidar unit or GPS. Roll, pitch and scanner scale were optimized during the calibration process until relative accuracy requirements were met.

Relative accuracy and internal quality were checked using at least 3 regularly spaced QC blocks in which points from all lines were loaded and inspected. Vertical differences between ground surfaces of each line were displayed. Color scale was adjusted to flag errors that were not within project specifications. Cross sections were visually inspected across each block to validate point to point, flight line to flight line, and mission to mission agreement.

The following relative accuracy specifications were used for this project:

- ≤ 6 cm maximum difference within individual swaths (intra-swath); and
- ≤ 8 cm RMSDz between adjacent and overlapping swaths (inter-swath).

A different set of QC blocks were generated for final review after any necessary transformations were applied.

2.12 Generation and Calibration of Raw Lidar Data- Leading Edge Geomatics

Availability and status of all required GPS and laser data were verified against field reports and any data inconsistencies were addressed.

Subsequently the mission points were output using Riegl's RiProcess initially with default values from Riegl or the last mission calibrated for the system. The initial point generation for each mission calibration was verified within Microstation/TerraScan for calibration errors. If a calibration error greater than specification was observed, the appropriate roll, pitch and scanner scale corrections were calculated. The point data were then regenerated with the new calibration values and validated internally again to ensure that the errors were fully addressed.

Data collected by the lidar unit was reviewed for completeness, acceptable density, and to make sure all data were captured without errors or corrupted values. All GPS, aircraft trajectory, mission information, and ground control files were reviewed and logged. A supplementary coverage check was carried out (Figure 4) to ensure that there were no unreported gaps in data coverage.

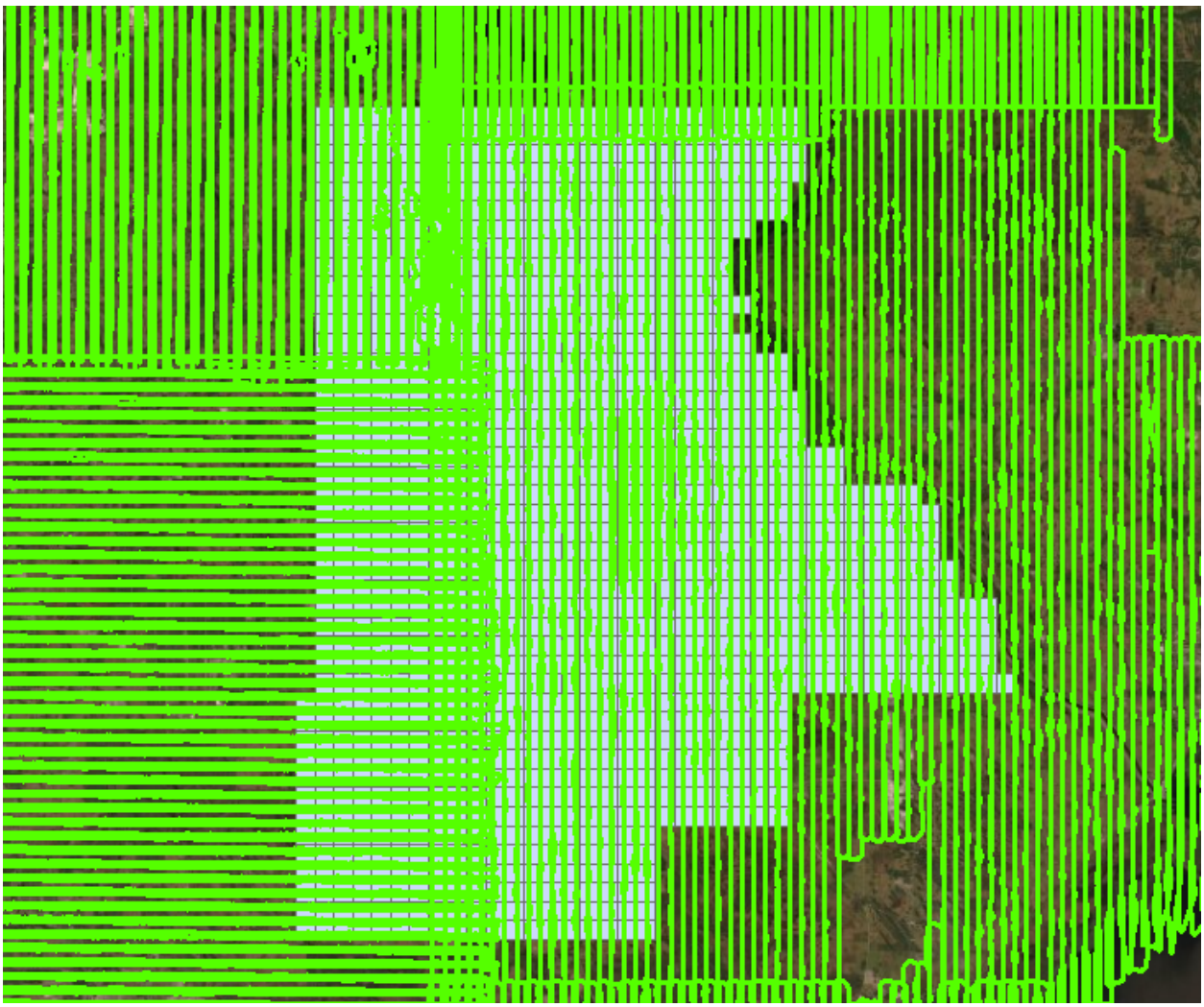

Figure 4. Lidar swath output showing complete coverage.

2.12.1 Boresight and Relative accuracy

The initial points for each mission calibration were inspected for flight line errors, flight line overlap, slivers or gaps in the data, point data minimums, or issues with the lidar unit or GPS. Roll, pitch and scanner scale were optimized during the calibration process until relative accuracy requirements were met (Figure 5).

Relative accuracy and internal quality were checked using at least 3 regularly spaced QC blocks in which points from all lines were loaded and inspected. Vertical differences between ground surfaces of each line were displayed. Color scale was adjusted to flag errors that were not within project specifications (Figure 6). Cross sections were visually inspected across each block to validate point to point, flight line to flight line, and mission to mission agreement.

The following relative accuracy specifications were used for this project:

- ≤ 6 cm maximum difference within individual swaths (intra-swath); and

- ≤ 8 cm RMSDz between adjacent and overlapping swaths (inter-swath).

A different set of QC blocks were generated for final review after any necessary transformations were applied.

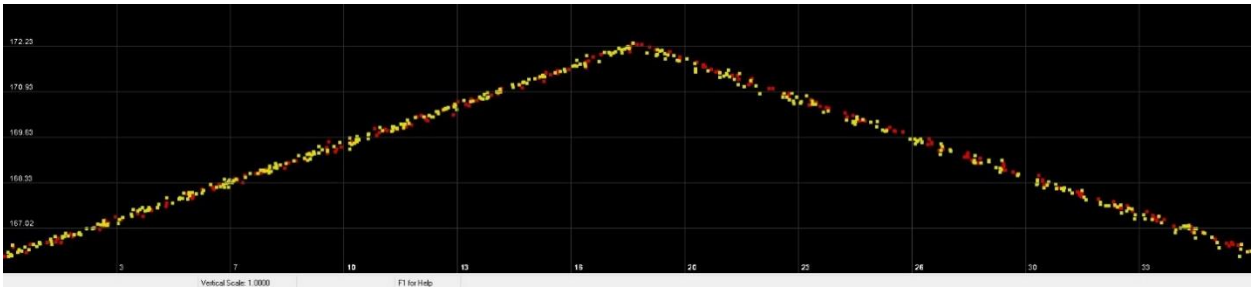

Figure 5. Profile views showing results of roll and pitch adjustments for Leading Edge Geomatics.

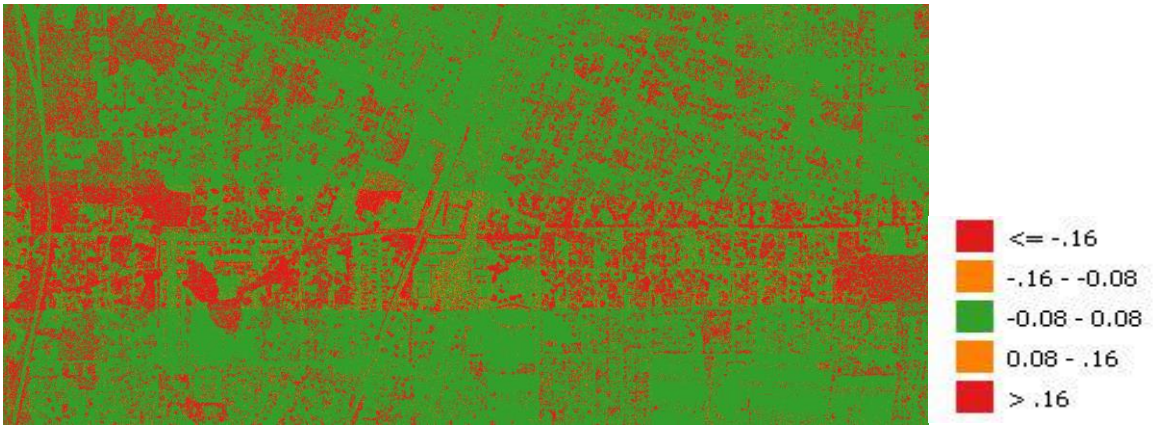

Figure 6. QC block colored by vertical difference between swaths to check accuracy at swath edges for Leading Edge Geomatics.

2.13 Final Calibration Verification- Woolpert

A preliminary RMSEz error check was performed by Woolpert at this stage of the project life cycle in the raw Lidar dataset against GNSS static and kinematic data and compared to RMSEz project specifications. The Lidar data was examined in non-vegetated, flat areas away from breaks. Lidar ground points for each flight line generated by an automatic classification routine were used. Prior to delivery to Dewberry, the elevation data was verified internally to ensure it met Non-Vegetated Vertical Accuracy (NVA) requirements (RMSEz ≤ 10 cm and Accuracy at the 95% confidence level ≤ 19.6 cm) when compared to kinematic GNSS checkpoints.

2.14 Final Calibration Verification- Leading Edge Geomatics

A preliminary RMSEz error check was performed by Leading Edge Geomatics at this stage of the project life cycle in the raw Lidar dataset against GNSS static and kinematic data and compared to RMSEz project specifications. The Lidar data was examined in non-vegetated, flat areas away from breaks. Lidar ground points for each flight line generated by an automatic classification routine were used. Prior to delivery to Dewberry, the elevation data was verified internally to ensure it met Non-Vegetated Vertical Accuracy (NVA) requirements (RMSEz ≤ 10 cm and Accuracy at the 95% confidence level ≤ 19.6 cm) when compared to kinematic GNSS checkpoints.

The following summary shows the results comparing the final calibrated Lidar data to NVA ground check points provided by Leading Edge Geomatics.

Table 5 - Ground control points (GCPs) vertical accuracy results.

100 % of Totals	# of Points	RMSEz (ft) NVA Spec=0.33 ft	NVA- Non-vegetated Vertical Accuracy ((RMSEz x 1.9600) Spec=0.64 ft	Mean (ft)	Std Dev (ft)	Min (ft)	Max (ft)
GCP	1463	0.12	0.23	-0.08	0.09	-0.41	0.13

3. LIDAR PRODUCTION & QUALITATIVE ASSESSMENT

3.1 Initial Processing

Following receipt of the calibrated swath data from the acquisition provider, Dewberry performed vertical accuracy validation of the swath data, inter-swath relative accuracy validation, intra-swath relative accuracy validation, verification of horizontal alignment between swaths, and confirmation of point density and spatial distribution. This initial assessment allowed Dewberry to determine whether the data was suitable for full-scale production.

3.1.1 Post Calibration Lidar Review

The table below identifies requirements verified by Dewberry prior to tiling the swath data, running initial ground macros, and starting manual classification.

Table 6 – Post calibration and initial processing data verification steps.

Requirement	Description of Deliverables	Additional Comments
Non-vegetated vertical accuracy (NVA) of the swath data meet required specifications of 19.6 cm at the 95%	The swath NVA was tested and passed specifications.	None

Requirement	Description of Deliverables	Additional Comments
confidence level based on RMSEz (10 cm) x 1.96		
The NPD/NPS (or Aggregate NPD/Aggregate NPS) meets required specification of 8 ppsm or 0.35 m NPS. The NPD (ANPD) is calculated from first return points only.	The average calculated (A)NPD of this project is 8 ppsm. Density raster visualization also passed specifications.	None
Spatial Distribution requires 90% of the project grid, calculated with cell sizes of 2*NPS, to contain at least one lidar point. This is calculated from first return points only.	98% of cells (2*NPS cell size) had at least 1 lidar point within the cell.	None
Within swath (Intra-swath or hard surface repeatability) relative accuracy must meet ≤ 6 cm maximum difference	Within swath relative accuracy passed specification.	None
Between swath (Inter-swath or swath overlap) relative accuracy must meet 8 cm RMSDz/16 cm maximum difference. These thresholds are tested in open, flat terrain.	Between swath relative accuracy passed specification, calculated from single return lidar points.	None
Horizontal Calibration-There should not be horizontal offsets (or vertical offsets) between overlapping swaths that would negatively impact the accuracy of the data or the overall usability of the data. Assessments made on rooftops or other hard planar surfaces where available.	Horizontal calibration met project requirements.	None
Ground Penetration-The missions were planned appropriately to meet project density requirements and achieve as much ground penetration beneath vegetation as possible	Ground penetration beneath vegetation was acceptable.	None
Sensor Anomalies-The sensor should perform as expected without anomalies that negatively impact the usability of the data, including issues such as excessive sensor noise and intensity gain or range-walk issues	No sensor anomalies were present.	None
Edge of Flight line bits-These fields must show a minimum value of 0 and maximum value of 1 for each swath acquired, regardless of which type of sensor is used	Edge of Flight line bits were populated correctly	None

Requirement	Description of Deliverables	Additional Comments
Scan Direction bits-These fields must show a minimum value of 0 and maximum value of 1 for each swath acquired with sensors using oscillating (back-and-forth) mirror scan mechanism. These fields should show a minimum and maximum of 0 for each swath acquired with Riegl sensors as these sensors use rotating mirrors.	Scan Direction bits were populated correctly	None
Swaths are in LAS v1.4 formatting	Swaths were in LAS v1.4 as required by the project.	None
All swaths must have File Source IDs assigned (these should equal the Point Source ID or the flight line number)	File Source IDs were correctly assigned	None
GPS timestamps must be in Adjusted GPS time format and Global Encoding field must also indicate Adjusted GPS timestamps	GPS timestamps were Adjusted GPS time and Global Encoding field were correctly set to 17	None
Intensity values must be 16-bit, with values ranging between 0-65,535	Intensity values were 16-bit	None
Point Source IDs must be populated and swath Point Source IDs should match the File Source IDs	Point Source IDs were assigned and match the File Source IDs	None

3.2 Data Classification and Editing

Once the calibration, absolute swath vertical accuracy, and relative accuracy of the data were confirmed, Dewberry utilized proprietary and TerraScan software for processing. The acquired 3D laser point clouds were tiled according to the project tile grid using proprietary software. Once tiled, the laser points were classified using a proprietary routine in TerraScan. This routine classified any obvious low outliers in the dataset to class 7 and high outliers in the dataset to class 18. Points along flight line edges that were geometrically unusable were flagged as withheld and classified to a separate class so that they would be excluded from the initial ground algorithm. After points that could negatively affect the ground were removed from class 1, the ground layer was extracted from this remaining point cloud using an iterative surface model.

This surface model was generated using four main parameters: building size, iteration angle, iteration distance, and maximum terrain angle. The initial model was based on low points being selected by a "roaming window" with the assumption that these were the ground points. The size of this roaming window was determined by the building size parameter. The low points were triangulated and the remaining points were evaluated and subsequently added to the model if they met the iteration angle and distance constraints. This process was repeated until no additional points were added within iterations. Points that did not relate to classified ground within the maximum terrain angle were not captured by the initial model.

After the initial automated ground routine, each tile was imported into TerraScan and a surface model was created to examine the ground classification. Dewberry analysts visually reviewed the ground surface model

and corrected errors in the ground classification such as vegetation, buildings, and bridges that were present following the initial processing. Dewberry analysts employed 3D visualization techniques to view the point cloud at multiple angles and in profile to ensure that non-ground points were removed from the ground classification. Bridge decks were classified to class 17 and bridge saddle breaklines were used where necessary. After the ground classification corrections were completed, the dataset was processed through a water classification routine that utilized breaklines to automatically classify hydro features. The water classification routine selected ground points within the breakline polygons and automatically classified them as class 9, water. During this water classification routine, points that were within 1 NPS distance or less of the hydrographic feature boundaries were moved to class 20, ignored ground, to avoid hydro-flattening artifacts along the edges of hydro features.

After manual classification, the LAS tiles were peer reviewed and then underwent a final independent QA/QC. After the final QA/QC and corrections, all headers, appropriate point data records, and variable length records, including spatial reference information, were updated and verified using proprietary Dewberry software.

3.2.1 Qualitative Review

Dewberry's qualitative assessment of lidar point cloud data utilized a combination of statistical analyses and visual interpretation. Methods and products used in the assessment included profile- and map view-based point cloud review, pseudo image products (e.g., intensity orthoimages), TINs, DEMs, DSMs, and point density rasters. This assessment looked for incorrect classification and other errors sourced in the LAS data. Lidar data are peer reviewed, reviewed by task leads (senior level analysts), and verified by an independent QA/QC team at key points within the lidar workflow.

The following table describes Dewberry's standard editing and review guidelines for specific types of features, land covers, and lidar characteristics.

Table 7 – Post calibration and initial processing data verification steps.

Category	Editing Guideline	Additional Comments
No Data Voids	The SOW for the project defines unacceptable data voids as voids greater than 4 x ANPS^2, or 1.96 m^2, that are not related to water bodies or other areas of low near-infrared reflectivity and are not appropriately filled by data from an adjacent swath. The LAS files were used to produce density grids based on Class 2 (ground) points for review.	No unacceptable voids were identified in this dataset
Artifacts	Artifacts in the point cloud are typically caused by misclassification of points in vegetation or man-made structures as ground. Low-lying vegetation and	None

Category	Editing Guideline	Additional Comments
	buildings are difficult for automated grounding algorithms to differentiate and often must be manually removed from the ground class. Dewberry identified these features during lidar editing and reclassified them to Class 1 (unassigned). Artifacts up to 0.3 m above the true ground surface may have been left as Class 2 because they do not negatively impact the usability of the dataset.	
Bridge Saddles	The DEM surface models are created from TINs or terrains. TIN and terrain models create continuous surfaces from the input points, interpolating surfaces beneath bridges where no lidar data was acquired. The surface model in these areas tend to be less detailed. Bridge saddles may be created where the surface interpolates between high and low ground points. Dewberry identifies problems arising from bridge removal and resolves them by reclassifying misclassified ground points to class 1 and/or adding bridge saddle breaklines where applicable due to interpolation.	None
Culverts and Bridges	It is Dewberry's standard operating procedure to leave culverts in the bare earth surface model and remove bridges from the model. In instances where it is difficult to determine whether the feature was a culvert or bridge, Dewberry errs on the side of culverts, especially if the feature is on a secondary or tertiary road.	None
In-Ground Structures	In-ground structures typically occur on military bases and at facilities designed for munitions testing and storage. When present, Dewberry identifies these structures in the project and includes them in the ground classification.	No in-ground structures present in this dataset

Category	Editing Guideline	Additional Comments
Dirt Mounds	Irregularities in the natural ground, including dirt piles and boulders, are common and may be misinterpreted as artifacts that should be removed. To verify their inclusion in the ground class, Dewberry checked the features for any points above or below the surface that might indicate vegetation or lidar penetration and reviews ancillary layers in these locations as well. Whenever determined to be natural or ground features, Dewberry edits the features to class 2 (ground)	No dirt mounds or other irregularities in the natural ground were present in this dataset
Irrigated Agricultural Areas	Per project specifications, Dewberry collected all areas of standing water greater than or equal to 2 acres, including areas of standing water within agricultural areas and not within wetland or defined waterbody, hydrographic, or tidal boundaries. Areas of standing water that did not meet the 2 acre size criteria were not collected.	Standing water within agricultural areas not present in the data
Wetland/Marsh Areas	Vegetated areas within wetlands/marsh areas are not considered water bodies and are not hydroflattened in the final DEMs. However, it is sometimes difficult to determine true ground in low wet areas due to low reflectivity. In these areas, the lowest points available are used to represent ground, resulting in a sparse and variable ground surface. Open water within wetland/marsh areas greater than or equal to 2 acres is collected as a waterbody.	No marshes present in the data
Flight Line Ridges	Flight line ridges occur when there is a difference in elevation between adjacent flight lines or swaths. If ridges are visible in the final DEMs, Dewberry ensures that any ridges remaining after editing and QA/QC are within project relative accuracy specifications.	No flight line ridges are present in the data
Temporal Changes	If temporal differences are present in the dataset, the offsets are identified with a shapefile.	If temporal offsets are present in the data, the areas are outlined in the temporal.shp

Category	Editing Guideline	Additional Comments
Low NIR Reflectivity	Some materials, such as asphalt, tars, and other petroleum-based products, have low NIR reflectivity. Large-scale applications of these products, including roadways and roofing, may have diminished to absent lidar returns. USGS LBS allow for this characteristic of lidar but if low NIR reflectivity is causing voids in the final bare earth surface, these locations are identified with a shapefile.	No Low NIR Reflectivity is present in the data
Laser Shadowing	Shadows in the LAS can be caused when solid features like trees or buildings obstruct the lidar pulse, preventing data collection on one or more sides of these features. First return data is typically collected on the side of the feature facing toward the incident angle of transmission (toward the sensor), while the opposite side is not collected because the feature itself blocks the incoming laser pulses. Laser shadowing typically occurs in areas of single swath coverage because data is only collected from one direction. It can be more pronounced at the outer edges of the single coverage area where higher scanning angles correspond to more area obstructed by features. Building shadow in particular can be more pronounced in urban areas where structures are taller. Data are edited to the fullest extent possible within the point cloud. As long as data meet other project requirements (density, spatial distribution, etc.), no additional action taken.	No Laser Shadowing is present in the data

3.2.2 Formatting Review

After the final QA/QC was performed and all corrections were applied to the dataset, all lidar files were updated to the final format requirements and the final formatting, header information, point data records, and variable length records were verified using proprietary tools. The table below lists the primary lidar header fields that are updated and verified.

Table 8. Classified lidar formatting parameters

Parameter	Project Specification	Pass/Fail
LAS Version	1.4	Pass
Point Data Record Format	6	Pass
Horizontal Coordinate Reference System	NAD83 (2011) FL State Plane Zone East in WKT format	Pass
Vertical Coordinate Reference System	NAVD88 (Geoid 12B), feet in WKT format	Pass
Global Encoder Bit	17 for adjusted GPS time	Pass
Time Stamp	Adjusted GPS time (unique timestamps)	Pass
System ID	Sensor used to acquire data	Pass
Multiple Returns	The sensor shall be able to collect multiple returns per pulse and the return numbers are recorded	Pass
Intensity	16-bit intensity values recorded for each pulse	Pass
Classification	Class 1: Unclassified Class 2: Ground Class 6: Buildings Class 7: Low Noise Class 9: Water Class 17: Bridge Decks Class 18: High Noise Class 20: Ignored Ground	Pass
Withheld Points	Withheld bits set	Pass
Scan Angle	Recorded for each pulse	Pass
XYZ Coordinates	Recorded for each pulse	Pass

4. BREAKLINE PRODUCTION & QUALITATIVE ASSESSMENT

4.1 Breakline Production Methodology

Breaklines were manually digitized within an Esri software environment, using full point cloud intensity imagery, bare earth terrains and DEMs, the lidar point cloud, and ancillary ortho imagery where appropriate.

When data characteristics are suitable, Dewberry may use eCognition software to generate initial, automated water polygons, which are then manually reviewed and refined where necessary.

Breakline features with static or semi-static elevations (ponds and lakes, bridge saddles, and soft feature breaklines) were converted to 3D breaklines within the Esri environment where breaklines were draped on terrains or the las point cloud. Subsequent processing was done on ponds/lakes to identify the minimum z-values within these features and re-applied that minimum elevation to all vertices of the breakline feature.

Linear hydrographic features show downhill flow and maintain monotonicity. These breaklines underwent conflation by using a combination of Esri and LP360 software. Centerlines were draped on terrains, enforced for monotonicity, and those elevations were then assigned to the bank lines for the final river/stream z-values.

Tidal breaklines may have been converted to 3D using either method, dependent on the variables within each dataset.

4.1.1 Breakline Collection Requirements

The table below outlines breakline collection requirements for this dataset.

Table 9. Breakline collection requirements

Parameter	Project Specification	Additional Comments
Ponds and Lakes	Breaklines are collected in all inland ponds and lakes ~2 acres or greater. These features are flat and level water bodies at a single elevation for each vertex along the bank.	None
Hydrographic Features	Breaklines are collected for all streams and rivers 8 ft nominal width or wider as dual line drains and single line drains for features <8 ft in nominal width but greater than 0.5 mi in length. The dual line drain features are flat and level bank to bank, gradient will follow the surrounding terrain and the water surface will be at or below the surrounding terrain. Streams/river channels will break at culvert locations however not at elevated bridge locations.	None
Coastal Feature	Breaklines are collected as polygon features depicting water bodies such as oceans, seas, gulfs, bays, inlets, slat marshes, very large lakes, etc. Includes any significant water body that is affected by tidal variations. Tidal variations over the course of collection, and between different collections, can result in discontinuities along shorelines. This is considered normal and should be retained. Variations in water surface elevation resulting from tidal variations during collection should not be removed or adjusted. Features should be captured as a dual line with	None

	one line on each bank. Each vertex placed shall maintain vertical integrity. Parallel points on opposite banks of the tidal waters must be captured at the same elevation to ensure flatness of the water feature. The entire water surface edge is at or below the immediate surrounding terrain.	
Islands	Donuts will exist where there are islands greater than 1 acre in size within a hydro feature.	None
Bridge Saddle Breaklines	Bridge Saddle Breaklines are collected where bridge abutments were interpolated after bridge removal causing saddle artifacts.	None
Soft Features	Soft Feature Breaklines are collected where additional enforcement of the modeled bare earth terrain was required, typically on hydrographic control structures or vertical waterfalls, due to large vertical elevation differences within a short linear distance on a hydrographic features.	None
Connectors	A CONNECTOR will be collected where a hydrographic feature is collected on either side of the road. The connector must snap to the adjoining hydrological features.	None

4.2 Breakline Qualitative Assessment

Dewberry performed both manual and automated checks on the collected breaklines. Breaklines underwent peer reviews, breakline lead reviews (senior level analysts), and final reviews by an independent QA/QC team. The table below outlines high level steps verified for every breakline dataset.

Table 10 – Breakline verification steps.

Parameter	Requirement	Pass/Fail
Collection	Collect breaklines according to project specifications using lidar-derived data, including intensity imagery, bare earth ground models, density models, slope models, and terrains.	Pass

Placement	Place the breakline inside or seaward of the shoreline by 1-2 x NPS in areas of heavy vegetation or where the exact shoreline is hard to delineate.	Pass
Completeness	Perform a completeness check, breakline variance check, and all automated checks on each block before designating that block complete.	Pass
Merged Dataset	Merge completed production blocks. Ensure correct horizontal and vertical snapping between all production blocks. Confirm correct horizontal placement of breaklines.	Pass
Merged Dataset Completeness Check	Check entire dataset for features that were not captured but that meet baseline specifications or other metrics for capture. Features should be collected consistently across tile boundaries.	Pass
Edge Match	Ensure breaklines are correctly edge-matched to adjoining datasets. Check completion type, attribute coding, and horizontal placement.	Pass
Vertical Consistency	Waterbodies shall maintain a constant elevation at all vertices Vertices should not have excessive min or max z-values when compared to adjacent vertices Intersecting features should maintain connectivity in X, Y, Z planes Dual line streams shall have the same elevation at any given cross-section of the stream	Pass
Vertical Variance	Using a terrain created from lidar ground (class 2, 8, and 20 as applicable) and water points (class 9) to compare breakline Z values to interpolated lidar elevations to ensure there are no unacceptable discrepancies.	Pass
Monotonicity	Dual line streams generally maintain a consistent down-hill flow and collected in the direction of flow – some natural exceptions are allowed	Pass
Topology	Features must not overlap or have gaps Features must not have unnecessary dangles or boundaries	Pass
Hydro-classification	The water classification routine selected ground points within the breakline polygons and automatically classified them as class 9, water. During this water classification routine, points that were within 1 NPS distance or less of the hydrographic feature boundaries were	Pass

	moved to class 20, ignored ground, to avoid hydroflattening artifacts along the edges of hydro features.	
Hydro-flattening	Perform hydro-flattening and hydro-enforcement checks. Tidal waters should preserve as much ground as possible and can be non-monotonic.	Pass

5. DEM PRODUCTION & QUALITATIVE ASSESSMENT

5.1 DEM Production Methodology

Dewberry utilized LP360 to generate DEM products and both ArcGIS and Global Mapper for QA/QC.

The final classified lidar points in all bare earth classes were loaded into LP360 along with the final 3D breaklines and the project tile grid. A raster was generated from the lidar data with breaklines enforced and clipped to the project tile grid. The DEM was reviewed for any issues requiring corrections, including remaining lidar misclassifications, erroneous breakline elevations, incorrect or incomplete hydro-flattening or hydro-enforcement, and processing artifacts. The formatting of the DEM tiles was verified before the tiles were loaded into Global Mapper to ensure that there was no missing or corrupt data and that the DEMs matched seamlessly across tile boundaries. A final qualitative review was then conducted by an independent review department within Dewberry.

5.2 DEM Qualitative Assessment

Dewberry performed a comprehensive qualitative assessment of the bare earth DEM deliverables to ensure that all tiled DEM products were delivered with the proper extents, were free of processing artifacts, and contained the proper referencing information. Dewberry conducted the review in ArcGIS using a hillshade model of the full dataset with a partially transparent colorized elevation model overlaid. The tiled DEMs were reviewed at a scale of 1:5,000 to look for artifacts caused by the DEM generation process and to verify correct and complete hydro-flattening and hydro-enforcement. Upon correction of any outstanding issues, the DEM data was loaded into Global Mapper for its second review and to verify corrections.

The table below outlines high level steps verified for every DEM dataset.

Table 11 – DEM verification steps.

Parameter	Requirement	Pass/Fail
Digital Elevation Model (DEM) of bare-earth w/ breaklines	DEM of bare-earth terrain surface (2.5') is created from lidar ground points and breaklines. DEMs are tiled without overlaps or gaps, show no edge artifact or mismatch, DEM deliverables are .tif format	Pass
DEM Compression	DEMs are not compressed	Pass
DEM NoData	Areas outside survey boundary are coded as NoData. Internal voids (e.g., open water areas) are coded as NoData	Pass

Hydro-flattening	Ensure DEMs were hydro-flattened or hydro-enforced as required by project specifications	Pass
Monotonicity	Verify monotonicity of all linear hydrographic features	Pass
Breakline Elevations	Ensure adherence of breaklines to bare-earth surface elevations, i.e., no floating or digging hydrographic feature	Pass
Bridge Removal	Verify removal of bridges from bare-earth DEMs and no saddles present	Pass
DEM Artifacts	Correct any issues in the lidar classification that were visually expressed in the DEMs. Reprocess the DEMs following lidar corrections.	Pass
DEM Tiles	Split the DEMs into tiles according to the project tiling scheme	Pass
DEM Formatting	Verify all properties of the tiled DEMs, including coordinate reference system information, cell size, cell extents, and that compression is not applied to the tiled DEMs	Pass
DEM Extents	Load all tiled DEMs into Global Mapper and verify complete coverage within the (buffered) project boundary and verify that no tiles are corrupt	Pass

6. DERIVATIVE LIDAR PRODUCTS

USGS required several derivative lidar products to be created. Each type of derived product is described below.

6.1 Interswath Raster

Interswath raster representing interswath alignment have been delivered. This raster was created from the last return of all points except points classified as noise or flagged as withheld. The images are in .TIFF format.

6.2 Swath Separation Images

Swath separation images representing interswath alignment have been delivered. These images were created from the last return of all points except points classified as noise or flagged as withheld. The images are in .TIFF format. The swath separation images are symbolized by the following ranges:

- 0-8 cm: **Green**
- 8-16 cm: **Yellow**
- >16 cm: **Red**

6.3 Interswath and Intraswath Polygons

6.3.1 Interswath Accuracy

The Interswath accuracy, or overlap consistency, measures the variation in the lidar data within the swath overlap. Interswath accuracy measures the quality of the calibration or boresight adjustment of the data in each lift. Per USGS specifications, overlap consistency was assessed at multiple locations within overlap in non-vegetated areas of only single returns. As with precision, the interswath consistency was reported by way of a polygon shapefile delineating the sample areas checked and attributed with the following and using the cells within each polygon as sample values:

- Minimum difference in the sample area (numeric)
- Maximum difference in the sample area (numeric)
- RMSDz (Root Mean Square Difference in the vertical/z direction) of the sample area (numeric). Intraswath Accuracy

The intraswath accuracy, or the precision of lidar, measures variations on a surface expected to be flat and without variation. Precision is evaluated to confirm that the lidar system is performing properly and without gross internal error that may not be otherwise apparent. To measure the precision of a lidar dataset, level or flat surfaces were assessed. Swath data were assessed using only first returns in non-vegetated areas.

Precision was reported by way of a polygon shapefile delineating the sample areas checked and attributed with the following and using the cells within each polygon as sample values:

- Minimum slope-corrected range (numeric)
- Maximum slope-corrected range (numeric)
- RMSDz of the slope-corrected range (numeric).

ANNEX D-1
Mechanical Plates (PLACEHOLDER – NOT USED)

ANNEX E-1
Conceptual Electrical Utility Plan for Recommended Plan

LAKE OKEECHOBEE COMPONENT A RESERVOIR (LOCAR)

SECTION 203 FEASIBILITY STUDY REPORT
CONCEPTUAL ELECTRICAL UTILITY PLAN FOR RECOMMENDED PLAN

DRAWING PREPARED BY J-TECH 12/19/2023

EXIST. S-67 (TO REMAIN)

ISTOKPOGA CANAL

LAKE ISTOKPOGA

CR 621

US HWY 98

CSX RAILROAD

KISSIMMEE RIVER

NORTH

0 3,000' 6,000'

EXIST. S-68 & S-68X (TO REMAIN)

EXIST. S-65D & S-65DX2 (TO REMAIN)

UNDERHILL RD

EXIST. BASINGER TRACT PROPERTY BOUNDARY (TO REMAIN)

EXIST. S-65DX1 (TO REMAIN)

BUTLERS BLUFF RD

C-41A

RESERVOIR SITE LIMITS OF CONSTRUCTION

PERIMETER CANAL (**CNL-1**) C/L

PERIMETER DAM C/L

BORROW AREA (TYP)

EXIST. AGI R12 TO BE REMOVED

EXIST. S-82 (TO REMAIN)

LOCAR WEST CELL

DIVIDER DAM C/L

LOCAR EAST CELL

LARSON DAIRY RD

RES. WEST INFLOW-OUTFLOW CANAL (**CNL-3**)

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS GATED CULVERT (**CU-2**)

CR 721

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS GATED DIVIDER DAM STRUCTURE (**DDS-1**)

EXIST. S-83 & S-83X (TO REMAIN)

C-41

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
100 CFS RES. SEEPAGE PUMP STA. (**SPS-1**)
(2) 50 CFS RES. SEEPAGE RETURN PUMPS W/ (1) 50 CFS AUXILLARY SEEPAGE PUMP

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS GATED OUTFLOW CULVERT (**CU-1A**)

C-38

TEMPORARY ELECTRICAL SERVICE TO BE EXTENDED TO:
TEMPORARY CONSTRUCTION OFFICE & STAGING AREA

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE (**CU-1B**)

SR 70

EXIST. S-65E & S-65EX1 (TO REMAIN)

EXIST. S-65EW (TO REMAIN)

BRIGHTON VALLEY IMPOUNDMENT

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS RES. INFLOW PUMP STA. (**PS-2**)
(4) 375 CFS RES. INFLOW PUMPS

EXIST. GLADES ELECTRIC COOPERATIVE MORRIS SUBSTATION

SW RUCKS DAIRY RD

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
GATED SPILLWAY (**S-84+**)
(TO REPLACE S-84 & S-84X)

C-41A

PERMANENT ELECTRICAL SERVICE TO BE EXTENDED TO:
1,500 CFS PUMP STA. (**PS-1**)
(4) 375 CFS PUMPS

LEGEND

LOCAR PROPOSED WATER MANAGEMENT FEATURES

- FIXED WEIR OUTFALL/OVERFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PERIMETER CANAL ADJUSTABLE WEIR STRUCTURE WITH FLOW DIRECTION ARROW
- UNGATED OVERFLOW SPILLWAY WITH FLOW DIRECTION ARROW
- UNGATED CULVERT WITH FLOW DIRECTION ARROWS
- GATED BI-DIRECTIONAL FLOW CONTROL STRUCTURE WITH FLOW DIRECTION ARROWS
- GATED OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- ADJUSTABLE WEIR OUTFLOW CULVERT STRUCTURE WITH FLOW DIRECTION ARROW
- PUMP STATION WITH FLOW DIRECTION ARROW

POWER UTILITY - POWER LINE LEGEND

- EXISTING FPL 3-PHASE POWER LINE
- PROPOSED FPL 3-PHASE POWER LINE
- EXISTING GLADES ELEC. COOP. POWER LINE
- PROPOSED GLADES ELEC. COOP. POWER LINE

ANNEX F-1
Register of Project-Specific Engineering Tasks to be Completed During the PED Phase

LOCAR Section 203 Final Feasibility Study Report and Final EIS
Prepared by J-Tech Date: 5/19/2024

ANNEX F-1: Register of Project-Specific Engineering Tasks to be Completed During the PED Phase, as specified in the LOCAR Section 203 Final Feasibility Study Report and Final EIS

Item No.	Engineering Task for PED Brief Description	Report Section	Subsection(s)	Engineering Task for PED Detailed Description
1	Datum conversion	ES / Section 6 / Annex B	ES.6.2 / 6.7.2 / B.4.1.1	Elevations in NGVD29 in LOCAR FS Report will be converted to NAVD88 as needed during PED.
2	Savings Clause - additional assessments	ES / Appendix A / Appendix B / Annex B	ES.6.7 / Table A.1-1 (Design Capacity column), A.6.1, Annex A-2.6 (Section 8) / Attachment 7 / B.1.2.6.2	Additional Savings Clause assessments of potential effects of Recommended Plan will be completed during PED. In accordance with section 3.11 of CERP Guidance Memorandum #3 (CGM-3), during PED, the 1D HEC-RAS-HMS H&H models presented in Annex A-2.6, will be converted to and/or replaced with 2D HEC-RAS-HMS H&H models (or other 2D H&H models approved by the Corps and District to use for the Project); and these 2D H&H models be used to run continuous simulations for a climatic period of record, in order to address the Flood Protection Savings Clause requirements of CGM-3. In addition, these 2D models will be used to run simulations that account for the effects of anticipated climate change (e.g. increases in precipitation depths of standard design storms as discussed in Section A.5.2.2 and Annex H). During the PED phase, a technical memorandum that summarizes this 2D H&H modeling, along with the 2D modeling files, will be submitted to the Corps, Jacksonville District for review and approval prior to finalizing the engineering design of the Project during the PED phase. Revisions to the 2D model and technical memorandum as well as revisions to the engineering design of the Project will be completed during the PED phase to address as needed any review comments from the Jacksonville District, concerning this 2D H&H modeling.
3	NRCS coordination	Section 4 / Appendix C	4.3.4 / C.3.1.10	Coordination with NRCS per the Farmland Protection Policy Act, concerning the use of farmland for the Recommended Plan will be completed during PED.
4	FFE determination	Section 5 / Appendix A	5.12 / A.12.2.3, A.15.3.1	Required minimum finished floor elevations (FFE) for buildings will be further evaluated during PED per the Federal Flood Risk Management Standard, more current standards/guidance, and other considerations.
5	Update emissions calcs	Section 5	5.14.1	Calculations for total CO_2 emissions during construction and the annual operational CO_2 emissions of the Recommended Plan will be updated during PED; and permitting requirements related to emissions will be determined during PED.
6	Cultural resources - additional investigations & coordination	Section 5 / Appendix D	5.24.1.2 / D.13	Additional cultural resource surveys will be completed during PED as needed. Measures to avoid, minimize or mitigate potential impacts to cultural resources will be implemented during PED as needed.
7	S-83 potential relocation	Section 6 / Appendix A	6.1.1.2 / A.1.3	The proposal to relocate S-83 will be further evaluated during PED.
8	Design of staging & access areas	Section 6 / Appendix A / Appendix D	6.1.2.1 / A.3.3.7 / D.4.2	Limits of construction staging areas, within the overall limits of construction for the Recommended Plan, will be determined during PED. Additional access areas will be identified during PED, as needed.
9	Finalize/optimize design of project components	Section 6 / Appendix A	6.4.1, 6.4.2.2 / A.2.2, A.6.1	The location and design of each project feature will be refined and optimized as the design of the project is finalized during PED.
10	Wave wall - inclusion/exclusion	Section 6 / Appendix A / Annex A-2.5	6.4.2.1 / A.2.1, A.5.5 / 1.0	During PED, the reservoir perimeter dam may be redesigned to include a wave wall as a construction cost savings measure.
11	Address Risk Register risks	Section 6 / Appendix A	6.4.2.1 / A.2.1	The project risks identified in the project risk register (included in Appendix B of the LOCAR Section 203 FS Report) will be further evaluated and addressed during PED. Risks TD1 - TD20 to be addressed as part of the finalization of the engineering design during PED.
12	Economic analysis for pump stations	Section 6 / Appendix A	6.4.2.2 / A.2.2	During PED, an economic analysis will be conducted on the components of each proposed pump station to ensure compliance with Corps EM 1110-2-3102.
13	Start date & responsibilities for PED	Section 6 / Annex B	6.7.2 / B.4.1.1	PED could begin after Congressional authorization and upon the SFWMD's concurrence. Either Corps or SFWMD will prepare the preliminary through final design documents during PED. All work during PED will be coordinated and reviewed between the Corps and SFWMD; and approved by Corps and SFWMD prior to construction.
14	Additional environmental & engineering site investigations	Section 6 / Appendix A / Appendix B / Appendix C / Annex B	6.7.2 / A.3.4 / Attachment 5 (TD9) / C.3.4 (Contamination Determinations) / B.4.1.1	PED will include environmental site assessments (Phase I and as needed Phase II), site-specific surveys, geotechnical and subsurface utility investigations, required to prepare construction contract documents. Demolition and disposal requirements for each LOCAR construction contract will be based on the findings of these environmental site assessments.
15	Update project assurances, saving clauses analyses & operating manuals	Section 6 / Annex B	6.7.2 / B.4.1.1	During PED, project assurances, savings clause analyses, and operating manuals will be updated consistent with the construction implementation phases, as needed.
16	CEPRA permit application	Section 6 / Annex B	6.7.2 / B.4.1.1	During PED, the lead construction agency (i.e., Corps or SFWMD) will prepare and submit a Comprehensive Everglades Restoration Plan Regulation Act (CERPRA) permit application (Florida Statutes [F.S.] 373.1502) to FDEP.
17	Use Corps standards for final design	Section 6 / Appendix C / Annex B	6.8.2.2 / C.2.12, C.2.21.12, C.2.21.15 / B.1.3.1, B.3.4, B.6.3	Design work completed during PED will adhere to Corps ER 1110-2-1150 and ER 1110-2-1156.

Item No.	Engineering Task for PED Brief Description	Report Section	Subsection(s)	Engineering Task for PED Detailed Description
18	Additional dam safety & seepage analyses, along with groundwater monitoring	Section 6	6.9.1, A.7.4, A.8.16	During PED, additional dam safety and seepage analyses will be performed, along with additional modelling to ensure that current levels of flood protection within the project basin are maintained during and after the construction of the Recommended Plan. Seepage and effects on groundwater in surrounding properties, effects on existing local drainage infrastructure, and dam safety evaluation and design criteria would be further modelled/refined during the PED phase. During PED, groundwater levels would be monitored within and around the reservoir site to establish a baseline condition. Groundwater levels would continue to be monitored to ensure there are no off-site impacts during construction and project operations.
19	Resiliency & adaptive mgmt. measures/plans	Section 6 / Annex C / Annex H	6.10.1.4 / C.16 / H.2, H.6	Resiliency and adaptive management measures for the constructed project features and their operation will be developed during PED, including but not limited to an adaptive management plan for the operation of the reservoir perimeter canal per Section C.16 of Annex C.
20	Update & calibrate 3D seepage model; finalize design of reservoir seepage canal & structures	Appendix A / Annex A-1.1 / Annex A-2.6 / Appendix B / Appendix C /Annex C	A.1.1, Table A.1-1, A.6.3.8, A.6.4.3, A.9.3.1(4.), A.9.4 / 3.5 / 8.0 / Attachments 1 (PCW-1 thru PCW-10 coversheet) & 7 / C.2.21.12 / C.8.1, C.15, Table C-2, C.16	During PED, a calibrated 3D seepage model will be completed as recommended in Section A.9.4, and the flow capacity of the SPS-1 seepage pumps will be adjusted as needed. Also, during PED, the number, limits and typical wet/dry season control elevations of each reach of the reservoir perimeter canal will be finalized, based on the results of the calibrated 3D seepage model. In addition, the sizing of the reservoir perimeter canal and its structures, including but not limited to the crest width and the allowable limits for the adjustment of the crest elevation of each perimeter canal weir (currently PCW-1 through PCW-10) will be finalized during PED, based on the results of the calibrated seepage model, updated 2D seepage/slope stability modeling of the reservoir perimeter dam, and 2D H&H modeling (Item No. 2). Also during PED, other analyses will be completed using the calibrated 3D seepage model as recommended in Section A.9.4.
21	Basinger Tract stormwater mgmt. system modifications - finalize w/ landowner	Appendix A	A.1.1, Table A.1-1, Fig. A.1-4 (Notes), A.3.3.6, A.3.4, A.6.4.4	During PED, the design of the proposed modifications to the Basinger Tract stormwater management system will be finalized based on additional review and coordination with the Basinger Tract property owner. In addition, the design of these modifications will be finalized based on the 2D H&H modeling completed during PED (Item No. 2). The reuse of any components of the existing AGI R12 pump stations for the construction of AGI-PS-1 and/or AGI-PS-2 will be coordinated during the PED phase with the landowner of the property where AGI-PS-1 and AGI-PS-2 are to be constructed.
22	RuMar Tract offsite drainage collection ditch design - finalize w/ landowner	Appendix A	Table A.1-1	During PED, the final design of the offsite drainage collection ditch to be located on the RuMar tract (ODCD-2), will be coordinated with and approved by the landowner of the property for which this ditch will serve and be located on. In addition, the design of this feature will be finalized based on the 2D H&H modeling completed during PED (Item No. 2).
23	Finalize design of offsite overflow structures w/ landowners	Appendix A / Annex A-2.6	Table A.1-1, Fig. A.1-4 (Notes) / 4.0 (Proposed Condition Model), 8.0	During PED, the final design of the offsite overflow structures (currently OOS-1 through OOS-8) will be coordinated with and approved by the landowner of the property for which each offsite overflow structure is to serve and be located on. In addition, the design of these features will be finalized based on the 2D H&H modeling completed during PED (Item No. 2).
24	Finalize design of reservoir perimeter canal overflow structures	Appendix A / Annex A-1.1	Table A.1-1 / 3.6	During PED, fixed weir crest elevation and width of the reservoir perimeter canal overflow structures (currently PCOS-1 through PCOS-4, and ODCD-OS-1) will be finalized based on the results of the calibrated seepage model (Item No. 20), updated 2D seepage/slope stability modeling of the reservoir perimeter dam (Item No. 20), and 2D H&H modeling (Item No. 2).
25	SPS-1 potential elimination	Appendix A	A.1.4	The proposal to eliminate seepage pump station SPS-1 will be further evaluated during PED.
26	Finalize number, scope & schedule of construction contracts	Appendix A	A.3.2	The number, scope and scheduling of the proposed construction contracts for the Recommended Plan will be finalized during PED.
27	Design life considerations	Appendix A	A.4.3	During PED, evaluations will be made concerning the potential need to increase the minimum-required design life beyond 50 years for components of each project feature.
28	NOAA Atlas 15	Appendix A	A.5.2.2, A.6.1	If NOAA Atlas 15 rainfall depths are available for use early enough during the PED phase of the Project, they should be compared with the NOAA Atlas 14 rainfall depths; and a determination should be made on which rainfall depths to use for the finalization of the Project design during the PED phase.
29	Evaluate & further explore measures to reduce required dam height	Appendix A	A.5.4.5	During PED, alternative design refinements to manage wave overtopping along the reservoir perimeter dam; and thereby, reduce the required height of the perimeter dam will be evaluated.
30	Finalize dam heights	Appendix A / Appendix B	A.5.4.5 / Attachment 7	During PED, the spatial variability in the wave overtopping along the embankment will be further investigated and the design refined accordingly. Such a design refinement may include but not limited to having a variable crest elevation along the reservoir perimeter and divider dams.
31	Finalize dam structures design	Appendix A	A.5.4.5	During PED, load cases involving potential wave and flood loads (including overtopping loads) on structures that will penetrate the reservoir perimeter and divider dams will be analyzed to finalize the design of these structures.
32	CFD modeling	Appendix A	A.6.1	During PED, computational fluid dynamics (CFD) modeling will be performed for all proposed canals as well as proposed intake/discharge channels for water management structures, to not only finalize the geometric design of these canals/channels, but to also finalize the design (i.e. the extent, thickness and type) of the riprap and/or other channel linings required to provide scour protection for these canals, channels and structures.
33	Seepage control features to be designed for the reservoir perimeter canal weirs	Appendix A	A.6.3.8	During PED. When the minimum, maximum and typical control elevations are finalized for each reach of the reservoir perimter canal, the perimeter canal adjustable weirs will be designed to resist sliding and overturning dur to the maximum anticpated head differential across each weir, which will also include the design of seeage control features for each weir.

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34	Additional geotechnical borings/tests	Appendix A / Appendix B	A.7.7, A.8.1, A.5.5.2 / Attachments 5 (TD5) & 7	Additional field exploration within the reservoir site is expected during the PED and the LOCAR construction phases to further define the best borrow materials sources for materials with higher fines content. A more detailed field exploration during PED must be performed for the LOCAR site to better understand the behavior of the in-situ materials and confirm that the preliminary design assumptions are valid for the extent of the Project. In addition, future investigations will provide information about the soil material characteristics when excavated, placed, and compacted, and assess suitability of available borrow resources.
35	Finalize chimney drain design	Appendix A	A.8.3.1	The specific filter gradation and inherent appurtenances for the reservoir perimeter dam chimney drain will be designed during PED.
36	Earthquake & soil liquefication analyses	Appendix A	A.8.4.2, A.8.4.4, A.8.8.3	End of Construction and Steady Seepage with Earthquake Loading analyses as well as liquefication potential of embankment foundations during earthquakes were not performed as part of the LOCAR Section 203 study. These analyses will be performed during PED.
37	Finalize geotechnical design of reservoir perimeter canal	Appendix A	A.8.7.2, A.8.16	During PED, an evaluation for the need to have a less steep side slope and/or filtered exit along the side slope of the reservoir perimeter canal closest to reservoir will be performed.
38	Settlement analysis for structures	Appendix A	A.8.16	During PED, a detailed settlement analysis for each structure should be performed and proposed waiting periods be re-evaluated based on additional site investigations and the result of settlement analyses.
39	Finalize of seepage cutoff wall design	Appendix A	A.8.16	During PED, the designer may consider optimizing the depth of the reservoir perimeter and divider dam seepage cutoff wall based on localized soil conditions along the alignment of the cutoff wall.
40	Filtered seepage exit with revetment along exterior of dam at concave corners	Appendix A	A.8.16	During PED, design consideration will be given to adding a filtered seepage exit with revetment along the exterior side slope and toe ditch of the perimeter dam at the locations where there is a concave corner in the perimter dam.
41	Update 3D seepage model stratigraphy	Appendix A	A.9.2.2, A.9.2.3	During PED, the stratigraphic layering of the 3D seepage model may need to be updated based on the findings from additional borings performed within and around the reservoir site during PED. The bottom of the surficial aquifer and the no flow boundary assumption should be further refined as more data becomes available in PED.
42	Additional soil permeability tests	Appendix A	A.9.3.3	During PED, a more thorough assessment of the permeability of the soil at the reservoir site through field test is highly recommended, in order to improve the accuracy of conductivity values inputted in the 3D seepage model, so that the 3D seepage model can more accurately simulate seepage impacts caused by the reservoir.
43	Additional sensitivity analyses for 3D seepage model	Appendix A	A.9.3.4	For the LOCAR Section 203 study a sensitivity analysis of the parameters and boundary types used to represent the farm canals in the 3D seepage model was completed for wet season conditions as described in Section A.9.3.4. During PED, it is recommended that this type of sensitivity analysis be completed for dry season conditions as well.
44	Obtain 408 Approval for construction of S-84+ and PS-1	Appendix A	A.11.2	During PED a 408 Approval will need to be obtained from the Corps, for the demolition of S-84/S-84X and the construction of S-84+ and PS-1, because of the impacts to the levees along C-41A, that are part of the Herber Hoover Dike.
45	Design stormwater mgmt. system for each pump station site	Appendix A	A.11.4.2	During PED a stormwater management system will be designed for each pump station site, in accordance with SFWMD's environmental resource permitting requirements.
46	Confirm scope of utility relocations	Appendix A / Appendix D	A.11.5.3 / D.20	During PED, an updated, comprehensive review of existing utilities within and adjacent to the project limits of construction will be performed to confirm if any other utility relocations are required for the construction of the Recommended Plan, beyond the utility relocations identified in Section A.11.5.3. Coordination for the relocation of any existing utilities will be performed with the appropriate utility companies during PED. If survey during PED identifies that utilities are required to be relocated, a Final Attorney's Opinion of Compensability will be prepared in writing for each proposed utility relocation per Appendix D, Section D.20.
47	Physical scaled modelling of pump station intakes	Appendix A	A.12.2.6	Based on the size and capacity of pump stations PS-1 and PS-2, physical scaled modelling of the intake of each of these pump stations and the Reservoir East Inflow-Outflow Canal (CNL-2) will be required during PED.
48	Coordinate electrical service extension design with FPL	Appendix A	A.13.1.1, A.13.1.2, A.13.1.3	During PED, the design team will coordinate with FPL to further develop the FPL's design of their system to provide permanent electrical service to pump stations PS-1, PS-2 and SPS-1, gated structure S-84+, CU-1A, DDS-1, and adjustable weir structure CU-1B.
49	Coordinate electrical service extension design with GEC	Appendix A	A.13.1.4	During PED, the design team will coordinate with GEC to further develop the GEC's design of their system to provide permanent electrical service to gated structure CU-2.
50	Finalize design of security features	Appendix A	A.17.2	During PED, the final design of all security features and elements for the Recommend Plan components will be coordinated with and approved by the SFWMD field station staff and security staff.
51	Determine location of boat ramps, access ramps and gates	Appendix A	A.18	During PED, the locations of boat ramps, access ramps, and gates for O&M purposes of the Recommended Plan will be determined.
52	Additional dam breach and non-dam-breach simulations	Appendix A	A.19.1	During PED, additional dam breach and non-dam-breach simulations will be performed to support the development of the Emergency Action Plan during PED.
53	Updates to consequences modeling to be based on latest traffic data for SR 70	Appendix A	A.19.1	During PED, the updated consequences modeling to be performed by the Corps, should include simulated traffic on SR 70 based on the latest traffic data from FDOT for SR 70.

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54	Update dam breach modeling & complete Emergency Action Plan	Appendix A / Annex C	A.19.2 / C.12	During PED, an Emergency Action Plan for the reservoir will be developed in conjunction with updates to the reservoir dam breach modeling performed during PED. Also, EAP should acknowledge that one of the highest areas for life loss in the event of a brach is SR 70; and the EAP should include procedures for closure of SR 70 in the event that a breach is immeinent or has occurred.
55	Continuation of public outreach	Appendix B	Attachment 5 (EX2)	During PED, SFWMD and Corps will continue to lead public outreach activities concerning the project.
56	Investigate design features to reduce risks to larval fish	Appendix C	C.3.4 (Effects on Nekton)	During PED, design features to reduce risks to larval fish will be investigated.
57	Perform Takings Analysis, if needed	Appendix D	D.12	During PED, if it is determined that induced flooding is anticipated outside of the reservoir site limits, a Takings Analysis will be prepared to determine if the expected induced flooding would rise to the level of a taking that would require additional real estate for the LOCAR project.
58	Complete real estate acquisition	Appendix D	D.23	Complete real estate acquisition for all real estate required for the construction and operation of the Recommended Plan, per Appendix D, Section D.23.
59	Complete design of recreational features	Appendix F		Complete design of recreational features consistent with preliminary plan for recreational features in Appendix F.
60	Complete work identified for PED in the technical review comments & responses	Appendix H		Complete work identified for completion during the PED phase in the technical review comments and responses in Appendix H.
61	Update DPOM based on final design and official structure names to produce PPOM	Annex C	See references to tasks to be completed during PED throughout Annex C	During PED, update the DPOM to produce the PPOM based on the final design of the project and the official SFWMD structure names given to each project feature, as well as update the DPOM to include: an adaptive management plan for the reservoir perimeter canal, interim operations during construction, and preliminary operations during operational testing & monitoring developed during PED. Updates to DPOM to produce the PPOM will include but not be limited to updating Sections C.3.2, C.7, C.12, C.15, C.16, C.17, C.20, C.22, C.23, and C.24 of the DPOM.
62	Complete adaptive mgmt. & monitoring activities identified for the PED phase	Annex D	D.1.13, D.1.14.2	See referenced subsections in Annex D for additional information.
63	Address project uncertainties identified to be addressed during PED	Annex D	Table D-9	See Table D-9 in Annex D for additional information.
64	Update hydrometeorological and hydraulic monitoring plan for the project based on final design	Annex D	D.3.2	See referenced subsection in Annex D for additional information.
65	Update climate change assessments	Annex H	H	Update climate change assessments in Annex H. See Item 28 in this table about the possibility of using projected future rainfall depths in NOAA Atlas 15 during PED.
66	Further evaluation of alternative water supply for reservoir from Istokpoga Canal	North of Lake O Storage Res. Section 203 Study Final EIS	Table A-2, Comment ID: AF-3	See Table A-2 in the Final EIS for additional information. See note 1 below this table.
67	Further evaluation of construction means & methods for the construction of the perimeter/divider dam seepage cutoff wall	North of Lake O Storage Res. Section 203 Study Final EIS	Table A-2, Comment ID: STOF-6	See Table A-2 in the Final EIS for additional information. See note 1 below this table.

Note:

1. In addition to Items 66 and 67 in this table, there are other statements in the North of Lake Okeechobee Storage Res. Section 203 Study Final EIS, concerning engineering tasks to be completed during PED; however, these statements are duplications of statements made in the LOCAR Section 203 Final FS report, which are referenced in this table.