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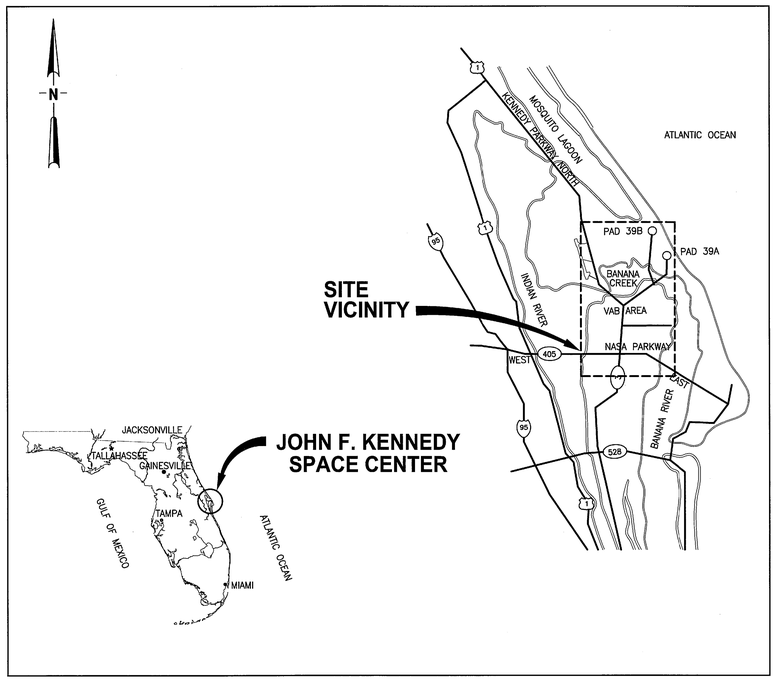
SPECIFICATION REFERENCE NO 79K38878

# REVITALIZE WATER & WASTEWATER SYSTEMS

# VOLUME 3 OF 5 - FORCE MAINS




## SITE VICINITY MAP

NTS

# NASA
# JOHN F. KENNEDY
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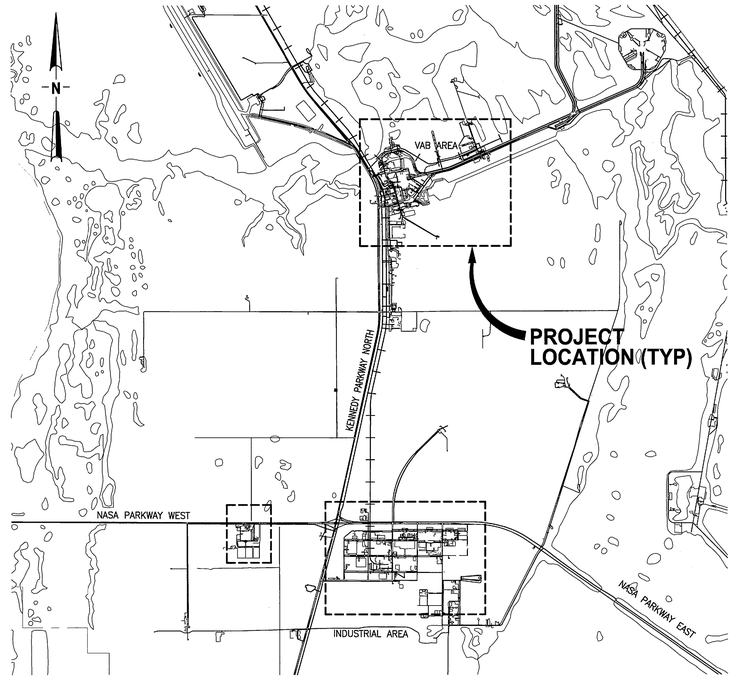


## PROJECT LOCATION MAP

NTS

**Previous Water & Wastewater Packages - For Historical Tracking Only**

| PCN | Title | Document Type | Associated Study/Drawing/Spec Numbers |
|---|---|---|---|
| 901961 | Kennedy Space Center Water Distribution System | System Drawing | 81K00694 |
| 902352 | KSC Sanitary Sewer Collection System | System Drawing | 81K00695 |
| 98307 | Water Consumption Analysis Study | Study Report | KSC-TA-7292 |
| 98497 | Kennedy Space Center Wastewater System Study Phase I | Study Report | KSC-DX-8046 |
| 98497.1 | KSC Wastewater Study Phase II | Study Report | KSC-TA-8906 |
| 96968.2 | Upgrade KSC Water and Wastewater Systems, Phase 3 - Water System Condition Assessment and Regional Modeling Report | Study Report | KSC-TA-10385 |
| 96968 | Revitalize and Upgrade KSC Water & Wastewater Systems | Contract Documents | 79K36173; 79K36174; 79K36255; 79K36256; 79K36257 |
| 96968.1 | Upgrade KSC Water and Wastewater Systems, Phase 2 | Contract Documents | 79K38517; 79K38518; 79K38648; 79K38649; 98K05225 |
| 98814 | Revitalize KSC Water Systems | Contract Documents | 79K38699; 79K38700; 79K38701; 79K38702; 79K38720; 79K38721 |
| 98815 | Revitalize KSC Wastewater Systems | Contract Documents | 79K38703; 79K38704 |
| 96968.3 | Revitalize Water & Wastewater Systems | Contract Documents | 79K38877; 79K38878; 79K38879; 79K38880 |

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| B | | REVISED SHEETS 1-2, 10, 35, AND 41-45 | 02/24/12 | |
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| APPROVED R. KOLLER | |
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**

**COVER SHEET**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
| PROJ. NO. 96968.3 | | SHEET 1 OF 46 | |

V1

KSC FORM 1-11 (3/76)(C/G 3/94)

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## GENERAL ABBREVIATIONS

| | |
|---|---|
| AC | ASBESTOS CEMENT |
| AIP | ABANDONED IN PLACE |
| ALUM | ALUMINUM |
| ANSI | AMERICAN NATIONAL STANDARD INSTITUTE |
| APPROX | APPROXIMATE |
| ARV | AIR RELEASE VALVE |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS |
| AVE | AVENUE |
| AWWA | AMERICAN WATER WORKS ASSOCIATION |
| BF | BLIND FLANGE |
| BFP | BACKFLOW PREVENTER |
| BFV | BUTTERFLY VALVE |
| BLD | BLIND |
| BLDG | BUILDING |
| BM | BENCH MARK |
| BTM | BOTTOM |
| BTM/ | BOTTOM OF |
| BV | BALL VALVE |
| BYP | BY-PASS |
| C/L, CL, C | CENTERLINE |
| CI | CAST IRON |
| CLF | CHAIN LINK FENCE |
| CLR | CLEARANCE |
| CO | CONTRACTING OFFICER |
| CONC | CONCRETE |
| CONST | CONSTRUCTION |
| CONT | CONTINUOUS |
| CV | CHECK VALVE |
| DET | DETAIL |
| DI | DUCTILE IRON |
| DIA | DIAMETER |
| DWG | DRAWING |
| E | EASTING |
| EA | EACH |
| ECC | ECCENTRIC |
| ELB | ELBOW |
| ELEC | ELECTRICAL |
| EL, ELEV | ELEVATION |
| EOP | EDGE OF PAVEMENT |
| EQ | EQUALLY |
| EST | ELEVATED STORAGE TANK |
| EW | EACH WAY |
| EXIST | EXISTING |
| FAB | FABRICATED |
| FAC | FLORIDA ADMINISTRATIVE CODE |
| FCA | FLANGED COUPLING ADAPTER |
| FCV | FLOW CONTROL VALVE |
| FDEP | FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION |
| FDOT | FLORIDA DEPARTMENT OF TRANSPORTATION |
| FFE | FINISHED FLOOR ELEVATION |
| FH | FIRE HYDRANT |
| FIG | FIGURE |
| FIN | FINISHED |
| FJ | FLANGED JOINT |
| FL | FLOOR |
| FLEX | FLEXIBLE |
| FLG | FLANGE(D) |
| FM | FORCE MAIN |
| FT | FOOT |
| GFE | GOVERNMENT FINISHED EQUIPMENT |
| GPM | GALLONS PER MINUTE |
| GR | GRADE |
| GS | GALVANIZED STEEL |
| GV | GATE VALVE |
| HDD | HORIZONTAL DIRECTIONAL DRILL |
| HDPE | HIGH DENSITY POLYETHYLENE |
| HP | HORSEPOWER |
| HORIZ | HORIZONTAL |
| HSP | HIGH SERVICE PUMP |
| HT | HEIGHT |
| IA | INDUSTRIAL AREA |
| ID | INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| IPS | IRON PIPE SIZE |
| JT | JOINT |
| KCCS | KENNEDY COMPLEX CONTROL SYSTEM |
| KSC | KENNEDY SPACE CENTER |
| LBS | POUNDS |
| LC | LAUNCH COMPLEX |
| LF | LINEAR FEET |
| LG | LONG |
| LS | LIFT STATION |
| MAX | MAXIMUM |
| MECH | MECHANICAL |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MIN | MINIMUM |
| MISC | MISCELLANEOUS |
| MJ | MECHANICAL JOINT |
| N | NORTH/NORTHING |
| N/A | NOT APPLICABLE |
| NAD | NORTH AMERICAN DATUM |
| NASA | NATIONAL AERONAUTICS AND SPACE ADMINISTRATION |
| NAVD | NORTH AMERICAN VERTICAL DATUM |
| NIC | NOT IN CONTRACT |
| NC | NORMALLY CLOSED |
| NO., # | NUMBER |
| NOM | NOMINAL |
| NPT | NATIONAL PIPE TAPER |
| NSF | NATIONAL SCIENCE FOUNDATION |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER |
| OSHA | OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION |
| PCB | POLYCHLORINATED BIPHENYLS |
| PCV | PRESSURE CONTROL VALVE |
| PE | PLAIN END |
| PET | POLYETHYLENE TUBING |
| PID | PROPORTIONAL INTEGRAL DERIVATIVE |
| PIV | POST INDICATOR VALVE |
| PLC | PROGRAMMABLE LOGIC CONTROLLER |
| POJ | PUSH ON JOINT |
| PPE | PERSONAL PROTECTIVE EQUIPMENT |
| PRL | POTENTIAL RELEASE LOCATION |
| PSI | POUNDS PER SQUARE INCH |
| PSIG | POUNDS PER SQUARE INCH GAUGE |
| PVC | POLYVINYL CHLORIDE |
| PVMT | PAVEMENT |
| PWQ | PROCESS WASTE QUESTIONNAIRE |
| RCP | REINFORCED CONCRETE PIPE |
| RED | REDUCER |
| REINF | REINFORCED |
| REQ'D | REQUIRED |
| RJ | RESTRAINED JOINT |
| RMJ | RESTRAINED MECHANICAL JOINT |
| RPOJ | RESTRAINED PUSH ON JOINT |
| RPZ | REDUCED PRESSURE ZONE |
| R/W | RIGHT OF WAY |
| SCH | SCHEDULE |
| STD | STANDARD |
| SE | SOUTH EAST |
| SQ | SQUARE |
| SR | STATE ROAD |
| SS, SST | STAINLESS STEEL |
| STL | STEEL |
| SWD | SIDE WATER DEPTH |
| SWMU | SOLID WASTE MANAGEMENT UNIT |
| T/ | TOP OF |
| T | THICK |
| TOC | TOP OF CONCRETE |
| THD | THREADED |
| TRP | TECHNICAL RESPONSE PACKET |
| TYP | TYPICAL |
| UG | UNDERGROUND |
| VAB | VEHICLE ASSEMBLY BUILDING |
| VIC | VISITOR INFORMATION CENTER |
| W/ | WITH |
| W | WIDE |
| WDS | WATER DISTRIBUTION SYSTEM |
| WM | WATER MAIN |
| WT | WEIGHT |
| WWF | WELDED WIRE FABRIC |

NOTE:

A. THIS IS A STANDARD ABBREVIATION LIST. SOME ABBREVIATIONS MAY APPEAR ON THIS LIST AND NOT IN THE DRAWINGS

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| SUBMITTED M. CLARK | 12/05/11 |
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| K. MILLER | |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## DRAWING INDEX AND ABBREVIATIONS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
| PROJ. NO. 96968.3 | | SHEET 2 | |

V2

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# GENERAL NOTES

1. TOPOGRAPHIC SURVEY INFORMATION WAS PROVIDED BY KUGELMANN LAND SURVEYING, INC., A REGISTERED PROFESSIONAL LAND SURVEYOR ON JULY 6, 2011, THE SURVEY ONLY APPLIES WITHIN THE LIMITS OF SURVEY LINE SHOWN ON THE DRAWINGS. AREAS INSIDE THE LIMITS OF SURVEY REPRESENT SURVEYED FEATURES FOUND DURING FIELD INVESTIGATION, UNLESS OTHERWISE NOTED. ELEVATION INFORMATION SHOWN IS FROM LIDAR FROM FDEM CONTRACT 07-HS-34-14-00-22-469 OBTAINED SEPTEMBER 2007 IN RESPONSIBLE CHARGE OF DAVID S. MAUNE, PSM OF DEWBERRY.
2. THE VERTICAL DATUM IS BASED ON NAVD 1988.
3. THE HORIZONTAL DATUM IS BASED ON THE NAD STATE PLANE EAST 1983.
4. A KSC EXCAVATION PERMIT IS REQUIRED FOR THIS PROJECT. CONTACT THE CONTRACTING OFFICER AND MISSION SUPPORT AT (321) 861-3840 FOR AN UNDERGROUND UTILITY SCAN.
5. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED. ANY DAMAGE TO SUCH ITEMS SHALL BE RESTORED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE GOVERNMENT. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE CO IMMEDIATELY.
6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF AN INDEPENDENT REGISTERED PROFESSIONAL LAND SURVEYOR FOR LAYOUT. PROOF OF REGISTRATION SHALL BE SUBMITTED TO THE CO 14 DAYS PRIOR TO STARTING THE SURVEY.
7. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING HIS/HER WORK.
8. THERE IS NO GUARANTEE THAT ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES WERE DISCOVERED AND SHOWN ON THE PLANS. THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) WHICH IN ANY WAY REFLECT/INCLUDE CONNECTIONS TO OR CONSTRUCTION NEAR EXISTING UTILITIES. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SUBMITTALS.
9. THE CONTRACTOR SHALL NOTIFY THE CO IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE CONSTRUCTION DRAWINGS.
10. THE CONTRACTOR SHALL COORDINATE THE RELOCATION OF CONFLICTING UNDERGROUND UTILITIES AS NEEDED WITH THE CO. CONTRACTOR SHALL COORDINATE CONSTRUCTION SCHEDULE WITH CONTRACTING OFFICER CONCERNING RELOCATION OF UTILITIES AND ANY ADDITIONAL RELOCATIONS RESULTING FROM CONFLICTS NOT DELINEATED ON THE DRAWINGS.
11. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED TO PRE-EXISITING CONDITIONS, BY AND AT THE EXPENSE OF THE CONTRACTOR, FOR APPROVAL OF THE CO.
12. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY HIS/HER WORK.
13. AT THE CONTRACTOR'S EXPENSE, THE CONTRACTOR SHALL RESTORE TO PRE-EXISTING CONDITIONS FOR APPROVAL OF THE CO ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, DITCHING, SIGNS, ETC WITH THE SAME TYPE OF MATERIAL THAT WAS REMOVED OR DAMAGED DURING CONSTRUCTION AS A RESULT OF CONSTRUCTION AS DIRECTED BY THE CO WITHOUT AN INCREASE IN THE CONTRACT OR PRICE. THIS INCLUDES ALL ASPHALT, CONCRETE, GRASS OR SOD REMOVAL NOT SPECIFICALLY IDENTIFIED ON THE DRAWINGS.
14. THE CONTRACTOR SHALL LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.
15. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE UNLESS OTHERWISE NOTED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED UNLESS NOTED OTHERWISE.
16. ALL PRESSURIZED PIPE/FITTING JOINTS, FLEXIBLE CONNECTORS, FLANGED COUPLING ADAPTERS, ETC, SHALL BE RESTRAINED USING SPECIFIED RESTRAINT SYSTEM UNLESS NOTED OTHERWISE.
17. SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. ALL OF THE VARIOUS PIPING APPLICATIONS ARE NOT NECESSARILY USED IN THE PROJECT. ALL BURIED AND EXPOSED PIPING SHALL BE PRESSURE TESTED AS SPECIFIED.
18. THE CONTRACTOR SHALL NOTIFY THE CO IN WRITING AT LEAST 14 FULL WORKING DAYS IN ADVANCE OF MAKING ANY CONNECTION TO THE WASTEWATER SYSTEM. THE CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM THE CO A MINIMUM OF 14 WORKING DAYS PRIOR TO INTERRUPTING WATER, SEWER, COMMUNICATION, ELECTRICAL, OR OTHER UTILITY SERVICE.
19. THE CONTRACTOR SHALL MAKE ALL CONNECTIONS TO NEW AND EXISTING UTILITIES AS SHOWN ON THE DRAWINGS AND SHALL FURNISH ALL LABOR AND MATERIALS NECESSARY TO COMPLETE THE WORK.
20. ALL JOINTS SHALL BE WATERTIGHT.
21. ALL ANCHORS AND FASTENERS SHALL BE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE. ALL PIPE/FITTING BOLT ASSEMBLIES SHALL BE CARBON STEEL AS SPECIFIED AND COATED AS SPECIFIED.
22. CONTRACTOR SHALL PROVIDE MEANS TO DEWATER SOILS FOR ALL CONSTRUCTION WORK INCLUDING WORK TO DRAIN, CLEAN, REHABILITATE, REPAIR, MODIFY, OR CONSTRUCT NEW OR EXISTING STRUCTURES OR UTILITIES.
23. FITTINGS MAY BE USED FOR PIPE ALIGNMENT CHANGES RATHER THAN DEFLECTING AT THE CONTRACTOR'S OPTION AND WITH NO ADDITIONAL COMPENSATION. ANYWHERE A TEE CAN BE ROLLED AS AN OFFSET THE CONTRACTOR IS PERMITTED TO DO SO. WITH REGARDS TO THE UTILITY CONFLICTS, THE CONTRACTOR IS TO DEFLECT THE FORCE MAIN TO CROSS THE UTILITY IF DEFLECTION CAN BE ACCOMPLISHED WITHIN 2 PIPE LENGTHS OF THE UTILITY. IF DEFLECTION IS NOT POSSIBLE THE CONTRACTOR MUST CROSS THE UTILITY IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL.
24. NOT ALL FITTINGS ARE ARE SHOWN ON DRAWINGS. THE MINIMUM PIPE COVER MUST BE MAINTAINED. ADD FITTINGS FOR VERTICAL OFFSETS.
25. ALL DRAINAGE AREAS THAT ARE CROSSED BY PIPELINES SHALL NOT BE OBSTRUCTED EXCEPT FOR SHORT PERIODS AS MAY BE NECESSARY DURING ACTUAL CONSTRUCTION HOURS.
26. THE CONTRACTOR SHALL NOT PLACE ANY FILL MATERIAL WITHIN WETTED DITCH OR WETLAND AREAS, AND SHALL INSTALL SILTATION FENCES BETWEEN WORK AND SUCH AREAS WHEN WORKING ADJACENT TO EITHER TYPE OF AREA.
27. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS OBTAINED FOR THIS PROJECT. CONTRACTOR SHALL RETAIN ON THE WORK SITE COPIES OF ANY PERMITS REQUIRED FOR CONSTRUCTION.
28. THIS PROJECT HAS THE POTENTIAL TO IMPACT THREATENED, ENDANGERED, AND PROTECTED SPECIES SUCH AS BUT NOT LIMITED TO THE GOPHER TORTOISE. THE CONTRACTOR SHALL CONTACT THE CO AND NASA ENVIRONMENTAL 14 DAYS PRIOR TO CONSTRUCTION ACTIVITIES IN ORDER FOR THE GOVERNMENT TO PERFORM SURVEY AND RELOCATION ACTIVITIES OF ANY IDENTIFIED SPECIES.
29. ALL MATERIALS, COATINGS, AND CHEMICALS THAT CONTACT RAW AND/OR DRINKING WATER SHALL BE IN CONFORMANCE WITH ANSI/NSF STANDARD 61.
30. OPEN CUT ROADWAY CROSSINGS FOR PIPE SIZES 4 INCHES IN DIAMETER OR SMALLER SHALL BE SLEEVED.
31. NOT USED.
32. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE VOLUME OF SOIL DISPLACED WITHIN THE SMWU AREAS. THE CONTRACTOR SHALL PROVIDE THE CO WITH THE APPROXIMATE VOLUME OF CONTAMINATED SOIL SO THAT THE PROPER ARRANGEMENTS CAN BE MADE FOR ITS REMOVAL AND DISPOSITION.
33. THE CONTRACTOR SHALL ADD A CAP OR RESTRAINED PLUG TO THE END OF ALL EXISTING LINES WHICH ARE TO REMAIN ACTIVE.
34. WHEN AND WHERE REQUIRED, PROVIDE DIVERSION FOR THE PIPE BURSTING/REPLACEMENT PROCESS. PROVIDE PUMPS, WASTEWATER STORAGE AND BY-PASS LINES OF ADEQUATE CAPACITY AND SIZE TO HANDLE ALL FLOWS. ALL COSTS FOR BY-PASS PUMPING AND WASTEWATER DISPOSAL REQUIRED DURING INSTALLATION OF THE PIPE SHALL BE SUBSIDIARY TO THE PIPE RECONSTRUCTION ITEM.
35. THE CONTRACTOR IS RESPONSIBLE FOR CONTINUITY OF SANITARY SEWER SERVICE TO EACH FACILITY CONNECTED TO THE SECTION OF SEWER DURING THE EXECUTION OF THE WORK. IF SEWAGE BACKUP OCCURS AND ENTERS BUILDINGS, CLEAN-UP, REPAIR, PROPERTY DAMAGE COST, AND CLAIMS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
36. PIPE BURST ROUTING IS SHOWN BASED ON BEST AVAILABLE INFORMATION AND IS FOR REFERENCE ONLY. NOT ALL APPURTENANCES ARE SHOWN ON DRAWINGS. THE REPLACEMENT FORCE MAINS AND ASSOCIATED APPURTENANCES SHALL BE REPLACED IN KIND WITH RESPECT TO SIZE AND FUNCTION UNLESS OTHERWISE NOTED.
37. COORDINATES AND ELEVATIONS SHOWN ARE FOR GENERAL LAYOUT AND BEST DESIGN. MINOR FIELD MODIFICATIONS MAY BE NECESSARY BASED UPON EXISTING FIELD CONDITIONS. MINOR DEVIATIONS ARE ALLOWED BY THE CONTRACTOR BUT AT NO ADDITIONAL COST TO THE CONTRACT.
38. IF EXISTING SOIL IS CONTAMINATED AS INDICATED ON THE SWMU AND PRL CONTAMINANTS TABLES ON EN2, CONTRACTOR IS TO REPLACE SOIL WITH CLEAN FILL.
39. CONTRACTOR TO SURVEY ALL MANHOLES THAT REQUIRE REPLACEMENT TO VERIFY AS-BUILTS MATCH EXISTING CONDITIONS, AND REPORT ANY SIGNIFICANT DEVIATIONS TO THE CO.
40. FOR CONNECTION TO EXISTING PIPING, ADDITIONAL RESTRAINTS ARE REQUIRED BASED ON THE CONDITIONS SPECIFIED IN THE CONTRACT DOCUMENTS. SEE DETAIL 3/C33
41. CONTRACTOR SHALL COMPLETELY SOD ALL DISTURBED AREAS. SOD VARIETY SHALL MATCH ADJACENT UNDISTURBED AREAS AND BE CERTIFIED WEED-FREE. ALL SOD ON SLOPES GREATER THAN 3:1 SHALL BE STAKED. CONTRACTOR SHALL FERTILIZE AND THOROUGHLY WATER ALL SOD AT TIME OF PLANTING AND AS NECESSARY UNTIL MATERIAL IS ESTABLISHED.
42. ALL EXISTING STORMWATER DRAINAGE PATTERNS AND CHANNELS ARE TO BE MAINTAINED. CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER IF THE WORK APPEARS TO INTERRUPT AN EXISTING STORMWATER DRAINAGE PATTERN. CONTRACTOR SHALL MAINTAIN A CLEAR PATH FOR ALL SURFACE WATER DRAINAGE STRUCTURES AND DITCHES DURING ALL PHASES OF CONSTRUCTION AND SHALL USE WHATEVER MEANS NECESSARY TO MANAGE STORMWATER SUCH THAT THE IMPACT TO CONSTRUCTION AND/OR SURROUNDING FACILITIES IS MINIMIZED. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EROSION, SEDIMENT TRANSPORT, DISTURBED FOUNDATIONS, IMPACT TO STRUCTURES, AND ANY OTHER DAMAGE CAUSED DURING CONSTRUCTION.
43. CONTRACTOR SHALL PREVENT THE DISCHARGE OF SEDIMENT INTO DRAINAGE DITCHES DUE TO CONSTRUCTION OPERATIONS. APPROVED EROSION CONTROL DEVICES SHALL BE INSTALLED AND MAINTAINED WITH BEST MANAGEMENT PRACTICES TO PREVENT DISCHARGE OF SEDIMENT INTO A DRY OR WET WATERCOURSE. EROSION CONTROL SHALL CONSIST OF ANCHORED HAY BALES, SILT FENCE, OR OTHER EROSION CONTROL METHODS APPROVED BY THE ENGINEER. SILT FENCE SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE FDOT STANDARD SPECIFICATIONS SECTION 104.
44. CONTRACTOR SHALL COMPLY WITH THE TURBIDITY CONTROL REQUIREMENTS OF THE SJRWMD, WHICH AT A MINIMUM MAY INCLUDE USING TURBIDITY CURTAINS. THE CONTRACTOR SHALL PREVENT INCREASES IN TURBIDITY IN EXCESS OF WATER QUALITY STANDARDS.
45. DRAINAGE STRUCTURES AND CULVERTS SHALL REMAIN FREE OF SEDIMENTATION AT ALL TIMES DURING CONSTRUCTION AND SHALL BE CLEANED OF SEDIMENT AFTER COMPLETION OF PAVING OPERATIONS.
46. UNVERIFIED UTILITIES AND AREAS OUTSIDE LIMITS OF SURVEY ARE BASED ON THE BEST AVAILABLE INFORMATION, INCLUDING NASA KSC GIS MAPS AND AS-BUILT DRAWINGS.

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| ST of LICENSURE: FL | |
| LICENSE NO: 48898 | |
| APPROVED M. CLARK | 12/5/11 |
| K. MILLER | 12/5/11 |

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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS**

**GENERAL NOTES**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 3 | |

V3

KSC FORM 1-11 (3/76)(C/G 3/94)

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# CIVIL LEGEND

- 1.00 — ELEVATION CALL OUT
- ASPHALT RESTORATION
- CONCRETE RESTORATION
- ITEM TO BE REMOVED
- S — CONTOURS
- SWALE
- FM-JB — FM-JB — FORCE MAIN (JACK AND BORE)
- FORCE MAIN (HORIZONTAL DIRECTIONAL DRILL)
- FM-PB — FM-PB — FORCE MAIN (PIPE BURSTING)
- FM-OC — FM-OC — FORCE MAIN (OPEN CUT)
- FM-RS — FM-RS — FORCE MAIN (REUSE OF EXISTING SLEEVE)
- WM — WATER MAIN 5
- WM-R — WATER MAIN IN-KIND REPLACEMENT 5
- RSAN — RSAN — EXISTING GRAVITY SEWER PIPE TO BE REPLACED
- LSS — EXISTING GRAVITY SEWER PIPE TO BE LINED ASSOCIATED LENGTHS ARE APPROXIMATE
- (170') 8"
- 100 — COORDINATE POINT
- +100.00 — SPOT ELEVATION
- BOLLARD
- UTILITY CONFLICT AREA
- SPT BORING LOCATION
- LIMITS OF SURVEY (SEE NOTE 1 ON V3)
- FULLY GROUTED ABANDONED FORCE MAIN EXTENDED TO 10 FEET BEYOND EDGE OF RAILROAD TRACKS. SEE SPECIFICATIONS FOR GROUT MATERIAL
- S9 — EXISTING SANITARY MANHOLE NUMBER
- EXISTING SANITARY MANHOLE TO BE REPLACED
- ASPHALT PAVEMENT RESTORATION WITH SLEEVED PIPE
- C10 — KEYMAP SHEET BOUNDARY
- LIMIT OF GROUNDWATER CONTAMINANT PLUME
- GAS — GAS — TYPICAL UNVERIFIED UTILITY (SEE NOTE 47 ON V3)

## PIPING SYMBOLS

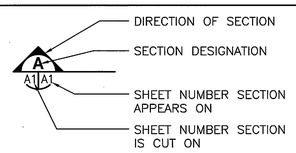
| DOUBLE LINE | SINGLE LINE | |
|---|---|---|
| | | EXISTING PIPE |
| | | NEW PIPE (ABOVE GROUND) |
| | | NEW PIPE (BELOW GROUND) |
| | | EXISTING PIPE TO BE REMOVED |
| | | FLANGED JOINT |
| | | MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT |
| | | FLEXIBLE COUPLING ADAPTER |
| | | HUB & SPIGOT JOINT |
| | | FLANGED COUPLING ADAPTER W/ THRUST TIES |
| | | FLEXIBLE COUPLING WITH THRUST TIES |
| | | BLIND FLANGE |
| | | 90° ELBOW UP |
| | | 90° ELBOW DOWN |
| | | TEE UP |
| | | TEE DOWN |
| | | FLANGED COUPLING ADAPTER |
| | | PUMP EXPANSION COUPLING |

# MECHANICAL LEGEND

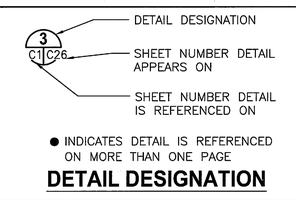
| DOUBLE LINE | SINGLE LINE | |
|---|---|---|
| | | ELBOW UP |
| | | ELBOW DOWN |
| | | CONCENTRIC REDUCER |
| | | ECCENTRIC REDUCER |
| | | UNION |
| | | CAP |
| | | TEE |
| | | TEE W/ RESTRAINED PLUG |
| | | ELBOW, 90 DEGREE |
| | | ELBOW, 45 DEGREE |
| | | ELBOW, 22.5 DEGREE |
| | | ELBOW, 11.25 DEGREE |
| | | ABANDON IN PLACE |
| | | SLEEVE |
| | | WYE |

## VALVE SYMBOLS

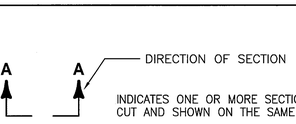
| DOUBLE LINE | SINGLE LINE | |
|---|---|---|
| | | PLUG |
| | | GATE |
| OR | | BUTTERFLY |
| | | BALL |
| | | CHECK |
| OR | | PRESSURE CONTROL |
| | | AIR RELEASE AND/OR VACUUM RELIEF |
| | | PRESSURE SAFETY RELEASE VALVE |




**SECTION DESIGNATION**




**DETAIL DESIGNATION**




**SECTION DESIGNATION**

## NOTES

A. THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS MAY APPEAR ON THE LEGEND AND NOT ON THE DRAWINGS.

B. EXISTING PIPE, EQUIPMENT, AND FEATURES ARE SHOWN LIGHT-LINED AND/OR SCREENED. PROPOSED PIPE AND EQUIPMENT IS SHOWN HEAVY-LINED OR BOLD.

# SURVEY LEGEND

- BACK-FLOW PREVENTER
- BOLLARD
- CURB INLET, STORM GRATE
- CONCRETE LIGHT POLE
- CO — CLEAN-OUT (SANITARY)
- CONCRETE POWER POLE
- E — ELECTRIC MARKER
- EB — ELECTRIC BOX
- ELECTRIC HANDHOLE
- EM — ELECTRIC METER
- ELECTRIC MANHOLE
- ELECTRIC TRANSFORMER
- FDC — FIRE DEPARTMENT CONNECTION
- F — FIRE METER
- FO — FIBER OPTIC CABLE MARKER
- FO — FIBER OPTIC CABLE HANDHOLE
- G — GAS MARKER
- G — GAS METER
- GUY
- GV — GAS VALVE
- HYDRANT
- IRV — INDICATOR VALVE
- LIGHT POLE
- M — MANHOLE, UNKNOWN
- MANHOLE, SANITARY SEWER
- MANHOLE, STORM SEWER
- M — MONITORING WELL
- STORM GRATE
- SIGN
- SV — SEWER VALVE
- S — SPRINKLER HEAD
- TH — TELEPHONE HANDHOLE
- TB — TELEPHONE BOX
- TM — TELEPHONE MARKER
- T — TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- TS — TRAFFIC SIGNAL BOX
- TRAFFIC SIGNAL
- W — WATER METER
- WV — WATER SPIGOT
- WATER VALVE
- W — WELL
- WOOD POWER POLE
- SOFT DIG
- CONCRETE
- FENCELINE
- TREELINE
- UGTV — UGTV — UNDERGROUND CABLE TV
- UGE — UGE — UNDERGROUND ELECTRIC
- FOC — FOC — UNDERGROUND FIBER OPTIC CAE
- UNDERGROUND UNKNOWN UTILIT
- GAS — GAS — UNDERGROUND GAS
- RAILROAD
- SAN — SAN — SANITARY SEWER
- SFM — SFM — SANITARY FORCEMAIN
- SITE FEATURE
- STM — STM — STEAMLINE
- STORM SEWER
- UGW — UGW — UNDERGROUND WATER
- UGCW — UGCW — UNDERGROUND CHILLED WATER
- 5 — EXISTING CONTOUR

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| K. MILLER | 11/1/11 |

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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**

**DRAWING LEGENDS AND DESIGNATIONS**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 | SHEET 4

V4

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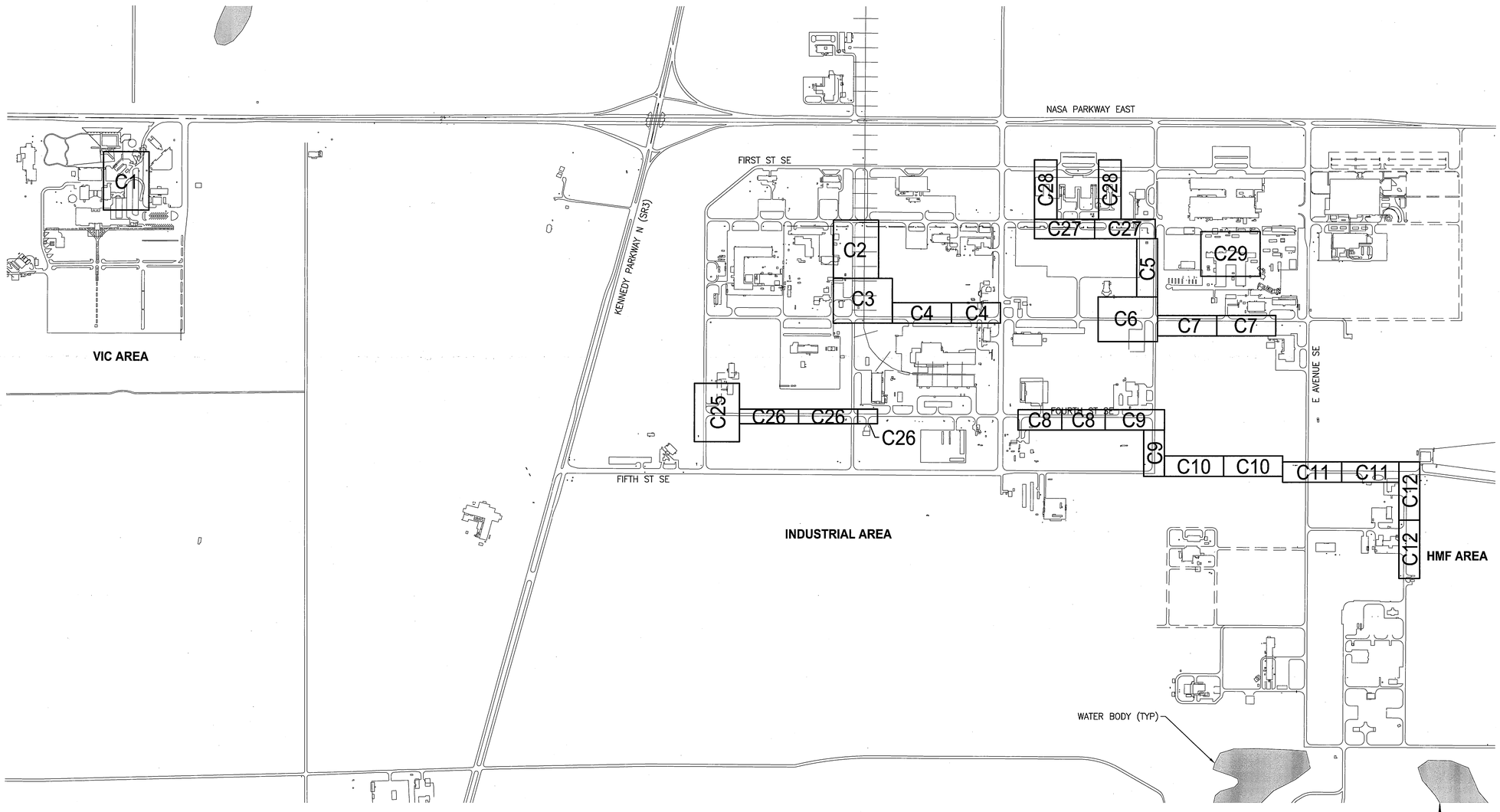


## INDUSTRIAL AREA/HMF AREA PLAN

1"=500'

GRAPHIC SCALE
0 250 500 1000
SCALE IN FEET
1"=500'

N

V5

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| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 10/31/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## KEY MAP (SOUTH)

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 5

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## VAB AREA PLAN
1" =500'

GRAPHIC SCALE
0 250 500 1000
SCALE IN FEET
1" =500'

N

V6

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## KEY MAP (NORTH)

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 | SHEET 6

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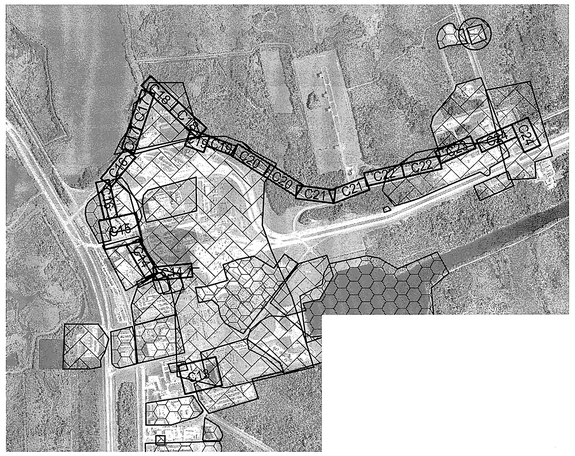
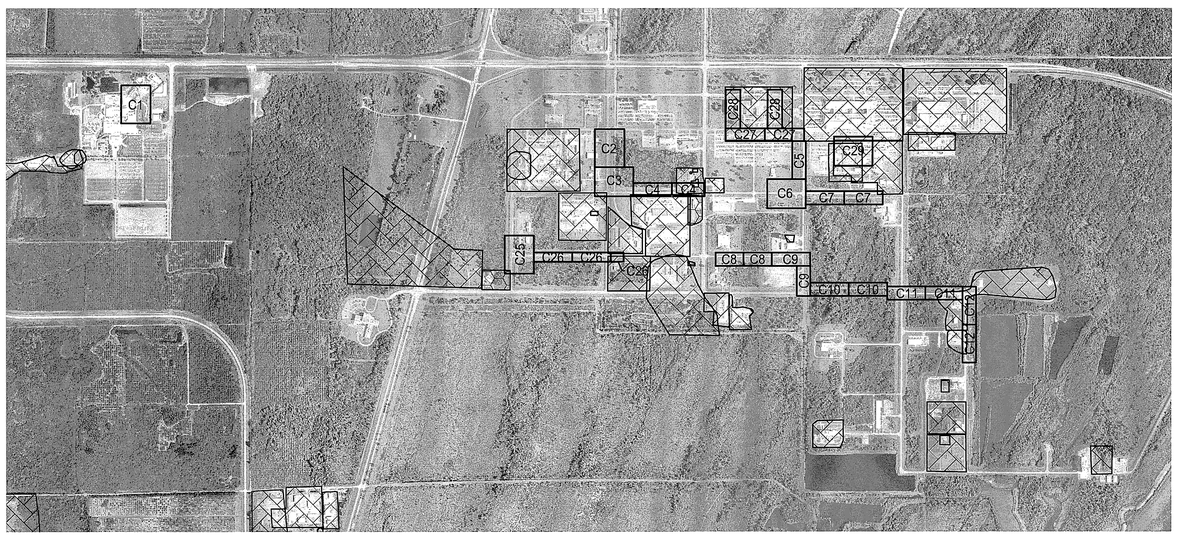
## LEGEND

SWMU SITE

PRL SITE




**VAB AREA PLAN**
1"=1000'




**INDUSTRIAL AREA /VIC AREA/HMF AREA PLAN**
1"=1000'

## GENERAL NOTES:

1. THE SYSTEMS BEING MODIFIED MAY BE LOCATED WITHIN VARIOUS SWMU OR PRL. THESE SITES CONTAIN GROUNDWATER CONTAMINATION, SOIL CONTAMINATION, OR BOTH. SOIL EXCAVATED FROM THE LAND SURFACE TO ANY DEPTH SHALL BE RETURNED TO THE AREA OF EXCAVATION FROM WHICH IT WAS REMOVED. SOIL EXCAVATED FROM THE SITE THAT CANNOT BE RETURNED TO THE AREA FROM WHICH IT WAS REMOVED SHALL BE COLLECTED BY THE CONTRACTOR AND PLACED IN AN APPROPRIATE CONTAINER IN ACCORDANCE WITH THE REGULATIONS. THE CONTRACTOR SHALL COORDINATE WITH THE CO AND NASA ENVIRONMENTAL TO HAVE THE EXCAVATED SOIL SAMPLED TO DETERMINE IF IT IS A HAZARDOUS WASTE. THE SOIL SHALL BE DISPOSED OF IN ACCORDANCE WITH THE PWQ/TRP PROCESS. THE CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICES TO PREVENT EROSION AND REMOVAL OF SOIL FROM SITE.
2. DEWATERING EFFLUENT SHALL BE DISCHARGED TO GRADE UPLAND OF THE EXCAVATED AREA AND ALLOWED TO PERCOLATE BACK INTO THE PERVIOUS GROUND SURFACE. DEWATERING SHALL NOT EXCEED 50 GPM WITHIN A SWMU OR PRL, UNLESS AUTHORIZED BY THE CO AND NASA ENVIRONMENTAL. BEST MANAGEMENT PRACTICES SHALL BE USED TO PREVENT DEWATERING EFFLUENT FROM ENTERING SURFACE WATERS. THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE CO AND NASA ENVIRONMENTAL 14 DAYS PRIOR TO COMMENCEMENT OF DEWATERING WORK WITHIN A SWMU OR PRL BOUNDARY FOR DEWATERING PLAN APPROVAL.
3. THE SIZE AND LOCATIONS OF SWMU/PRL AREAS ARE BASED ON THE BEST AVAILABLE INFORMATION AND LOCATIONS AND SIZE OF AREAS ARE APPROXIMATE.
4. THE CONTRACTOR IS TO CONTACT THE CO SHOULD CONTAMINANTS OR SUSPECTED CONTAMINANTS BE IDENTIFIED OUTSIDE THE LIMITS OF THE IDENTIFIED SWMU/PRL AREAS AND WITHIN THE LIMITS OF CONSTRUCTION.
5. SWMU/PRL CONTAMINANT DATA WAS PROVIDED BY NASA ENVIRONMENTAL.

**GRAPHIC SCALE**
0 500 1000 2000
SCALE IN FEET
1"=1000'

N

EN1

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| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## SWMU/PRL SITE KEY MAP

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 7 | |

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## SWMU CONTAMINANTS

| SWMU | CONTAMINANTS | LOCATION (MEDIA) | STATUS | NOTES | DWG NO |
|---|---|---|---|---|---|
| 4 | POLYCHLORINATED BIPHENYLS (PCBS), POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS) | SOIL | LTM | | |
| | VOLATILE ORGANIC COMPOUNDS (VOCS) | GROUNDWATER | | | |
| 8 | CHLORINATED VOLATILE ORGANIC COMPOUNDS [CVOCS (TCE, CDCE, VINYL CHLORIDE (VC))], PENTACHLOROPHENOL (PCP) | GROUNDWATER | CMS | | C3 |
| | ZINC, ARSENIC, BERYLLIUM, LEAD, BENZO(A)PYRENE (BAP), COPPER, CADMIUM, CHROMIUM, PAHS, PCBS, PCP | SOIL, SEDIMENT | | | |
| 9 | CVOCS (TCE, CDCE, VC), METALS (ALUMINUM, ARSENIC, BARIUM, LEAD, MERCURY, THALLIUM) | GROUNDWATER | CMI | | |
| | BENZO(A)PYRENE (BAP), ARSENIC, NICKEL, ZINC | SOIL, SEDIMENT | | | |
| 10 | VOCS AND PCBS (GROUNDWATER); NONE (SOIL) | GROUNDWATER: WATER TABLE TO 30 FT BELOW LAND SURFACE | CMI | | |
| 13 | PAHS, METALS | SOIL, SEDIMENT | CMI | | |
| | VOCS | GROUNDWATER | | | |
| 14 | PCBS, PAHS, ARSENIC | SOIL, SEDIMENT | LTM | | |
| | VOCS, IRON | GROUNDWATER | | | |
| 21 | PCBS | SOILS: PCBS IN SURFACE SOILS SURROUNDING SANDBLAST FACILITIES | LUCIP | | |
| 24C | VOCS AND PETROLEUM | GROUNDWATER: SEE SWMU 035 FOR PETROLEUM, LOW LEVEL VOCS CAN ALSO BE FOUND IN GENERAL AREA BELOW 20 FT BLS | LTM | PART OF SWMU 056 | |
| 30 | VOCS, SEMIVOLATILE ORGANIC COMPOUNDS (SVOCS) | GROUNDWATER | CMI | | C22–C24 |
| 35 | PETROLEUM | GROUNDWATER: SMALL AREA OF PETROLEUM CONTAMINANTS IN SHALLOW GROUNDWATER NORTH OF ABOVE GROUND STORAGE TANKS | SA | | |
| 36 | VOCS | PART OF GROUNDWATER PLUME FROM SWMU 010 ENCROACHES ON THE SOUTHEAST CORNER OF THIS SITE | SA | | |
| 39 | VOCS | GROUNDWATER | CMI | | |
| 40 | VOCS | GROUNDWATER: WATER TABLE TO 50 FT BELOW LAND SURFACE | LTM | | |
| 41 | VOCS[(TDCE, CDCE, VC, DFP (DECAFLUOROPENTANE)] | GROUNDWATER | RFI/IM | | |
| 43 | PCBS | SOIL | CMI | | |
| 44 | PAHS, PCBS, THALLIUM | SOIL | LUCIP | | C15, C16 |
| 45 | NICKEL | SWALE SOIL | CMI | | C4 |
| | VOCS | GROUNDWATER | | | |
| 55 | PCBS, METALS | SOIL | CMI, LTM | | |
| | VOCS | GROUNDWATER | | | |
| 56 | VOCS, AMMONIA | GROUNDWATER | CMI | | C13–C16, C18–C20 |
| | BAP, PCBS | SOIL | | | |
| 67 | PCBS, PAHS | SOIL | CMI | | |
| | VOCS, ALUMINUM | GROUNDWATER | | | |
| 70 | VOCS [TRICHLOROFLUOROMETHANE (TCFM) AND VC] AND ALUMINUM | GROUNDWATER | LUCIP | | |
| 72 | METALS, PAHS, AND TRPH | SOIL, SWALE SOIL | CMI | | C14, C15 |
| | ALUMINUM, VOCS | GROUNDWATER | | | |
| 76 | PCBS, PAHS | SOIL | LTM | | C5, C25 |
| | VOCS, IRON | GROUNDWATER | | | |
| 77 | CVOCS | GROUNDWATER | RFI/IM | | |
| | COPPER, CHROMIUM | SOIL | | | |
| 79 | VINYL CHLORIDE | GROUNDWATER | CS | | |
| 80 | VOCS | GROUNDWATER: WATER TABLE TO 50 FT BELOW LAND SURFACE | LTM | | |
| 81 | COPPER, ARSENIC, BAP, DIBENZO(A,H)ANTHRACENE, TOTAL PETROLEUM HYDROCARBONS (TPH) | SOIL/SWALE SOIL | LTM | | |
| | ANTIMONY | GROUNDWATER | | | |
| 82 | VOCS (CDCE, VC) | GROUNDWATER | CMS | | |
| 84 | 1,1–BIPHENYL, ARSENIC, LEAD | GROUNDWATER | CMI | | |
| 85 | VC | GROUNDWATER | LTM | | |
| 88 | CVOCS (TCE, VC) | GROUNDWATER | CMI | | |
| 89 | TCE, CDCE, VC | GROUNDWATER | RFI/IM | | C24 |

## SWMU CONTAMINANTS

| | | | | | |
|---|---|---|---|---|---|
| 90 | PCBS, TRPH, BARIUM, CHROMIUM, TCE, FREON 113 | SOIL | CMS/IM | | C11, C12 |
| | TETRACHLOROETHENE (PCE), TCE, CDCE, 1,1–DCE, 1,1 DCA, VC, FREON 113 | GROUNDWATER | | | |
| 91 | VC | GROUNDWATER | RFI | | C7, C29 |
| 92 | PCBS, PAHS | SOIL | CMI | | C3, C4 |
| 94 | AMMONIA | GROUNDWATER | LTM | | |
| 95 | VOCS (TCE, 1,1–DCE, CDCE, TDCE, VC) | GROUNDWATER | CMS/IM | | |
| 96 | BARIUM, COPPER, PCBS, TOTAL PETROLEUM HYDROCARBONS (TPH) | SOIL | CMI | | |
| 98 | AMMONIA | GROUNDWATER | LTM | | |
| 99 | BAP, PAHS | SOIL | LTM | | |
| | PETROLEUM HYDROCARBONS | GROUNDWATER | | | |
| 100 | VOCS (TCE, CDCE, TDCE, VC) | GROUNDWATER | RFI | | |
| 101 | VOCS WITH VINYL CHLORIDE ONLY CONTAMINANT OF CONCERN EXCEEDING GW CLEANUP CRITERIA | GROUNDWATER | LTM | | C14 |
| 102 | VOCS (TCE, CDCE, VC) | GROUNDWATER | RFI | | C23, C24 |
| 104 | PCBS | SOIL, CONCRETE | RFI/IM | | C25, C27, C28 |
| 106 | (AROCLOR–1254, BENZO(A)PYRENE TOTAL EQUIVALENTS [BAP TEQ], ARSENIC, BARIUM, CHROMIUM, COPPER, LEAD, MERCURY | SOIL | RFI/IM | | |
| | VINYL CHLORIDE | GROUNDWATER | | | |

BAP= BENZO(A)PYRENE

BLS= BELOW LAND SURFACE

CDCE= CIS–DICHLOROETHENE

CS= CONFIRMATION SAMPLING

CMI= CORRECTIVE MEASURES IMPLEMENTATION

CMS= CORRECTIVE MEASURES STUDY

CVOCS= CHLORINATED VOLATILE ORGANIC COMPOUNDS

DCA= DICHLOROETHANE

DCE= DICHLOROETHANE

DFP= DECAFLUOROPENTANE

IM= INTERIM MEASURE

LTM= LONG TERM MONITORING

LUCIP= LAND USE CONTROL IMPLEMENTATION PLAN

PAHS= POLYNUCLEAR AROMATIC HYDROCARBONS

PCBS= POLYCHLORNATED BIPHENYLS

PCP= PENTACHLOROPHENOL

RFI= RESOURCE CONSERVATION RECOVERY ACT (RCRA) FACILITY INVESTIGATION

TCE= TRICHLOROETHENE

TCFM= TRICHLOROFLUOROMETHANE

TDCE= TRANS–DICHLOROETHENE

TRPH= TOTAL RECOVERABLE PETROLEUM HYDROCARBONS

TPH= TOTAL PETROLEUM HYDROCARBONS

VC= VINYL CHLORIDE

VOCS= VOLATILE ORGANIC COMPOUNDS

## PRL CONTAMINANTS

| PRL | CONTAMINANTS | LOCATION (MEDIA) | STATUS | NOTES | DWG NO |
|---|---|---|---|---|---|
| 51 | PETROLEUM | GROUNDWATER AND SOIL: AREA SOUTH OF FACILITY CONTAINS PETROLEUM PRODUCTS FROM 5–15 FT BLS. | CMI | | |
| 84 | VOCS | GROUNDWATER: WATER TABLE TO 50 FT BELOW LAND SURFACE | LTM | CRAWLER PARK SITE SOUTH, PART OF SWMU 044 | |
| | METALS AND PAHS(SOIL) | SOIL | | | |
| 86B | PCBS | GROUNDWATER: PCBS IN SHALLOW GROUNDWATER (5 TO 15 FT BLS) SOUTH OF AN POWER BUILDING | LTM | STP14, PART OF SWMU 021 | |
| 144 | NOT AVAILABLE | NOT AVAILABLE | CS/IM | | |
| 149 | ARSENIC | SOILS: ARSENIC IN SURFACE SOILS BENEATH PLAYGROUND POUR AND PLAY SURFACE | | | |
| 150 | PCBS | SOIL: PCBS IN SOIL BENEATH TRANSFORMER PAD ONLY | LUCIP | | |
| 164 | NO CONCERNS IN THIS AREA | NONE | LTM | | |
| 165 | NOT AVAILABLE | | SAR | SAR ON HOLD | |
| 166 | PCBS, BAP | SOIL | CS | CURRENTLY UNDERGOING IM, WILL BE NFA | |
| 167 | PCBS, COPPER | SOIL, GROUNDWATER | CS/IM | NFA PENDING SRCO | |
| 170 | PCBS | SOIL, CONCRETE, ASPHALT | CS | SOIL IM NO EARLIER THAN FY12 | |
| 172 | NOT AVAILABLE | SOIL, GROUNDWATER | CS | NO LOCS NEAR LIFT STATION, CS ON HOLD | |
| 174 | PCBS, BAP, COPPER, CHROMIUM, TPH 2,6–DINITROTOLUENE, CARBAZOLE, ACENAPTHENE, NAPTHALENE, DIBENZO(A,H)ANTHRACENE | SOIL | CS | | |
| | DIBENZO(A,H)ANTHRACENE | GROUNDWATER | | | |
| 175 | NOT AVAILABLE | SOIL AND GROUNDWATER | CS | CS ON HOLD | |
| 176 | NO CONTAMINANTS IDENTIFIED YET | CS ON HOLD | CS | | C15, C16 |
| 182 | BAP, ZINC | SOIL | CS | | |
| | DCE | GROUNDWATER | | | |
| 187 | NOT AVAILABLE | SOIL AND GROUNDWATER | CS | CS ON HOLD (FY12 AT EARLIEST) | |

SAR= SWMU ASSESSMENT REPORT SITE REHABILITATION

SRCO= COMPLETION ORDER

## ENVIRONMENTAL NOTES

A. THE CONTRACTOR SHALL SUBMIT A SITE SPECIFIC HEALTH AND SAFETY PLAN TO THE CO PRIOR TO START OF WORK PER SPECIFICATION SECTION 01 35 26. THE SPECIAL CONDITIONS OF THE CONTRACT DOCUMENTS, AND ALL APPLICABLE STATE AND FEDERAL REQUIREMENTS.

B. HEAVY METALS AND/OR PCB'S IN PAINT AND MATERIALS ARE ASSUMED ON THE FACILITIES TO BE DEMOLISHED. CONCENTRATIONS ARE LOW ENOUGH IN RELATION TO OVERALL WEIGHT OF THE STRUCTURE THAT THE GOVERNMENT WILL ALLOW THE DISPOSAL OF THE STRUCTURES AT THE GOVERNMENT OWNED KSC CLASS III LANDFILL SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. UNPAINTED METALS AND CONCRETE SHALL BE RECYCLED IN ACCORDANCE WITH THE SPECIAL CONDITIONS OF THE CONTRACT DOCUMENTS.

## ASBESTOS ABATEMENT NOTES

C. THIS PROJECT INCLUDES CUTTING AND CAPPING OF ASBESTOS CEMENT PIPE TO BE ABANDONED IN PLACE. THE CONTRACTOR SHALL HANDLE ASBESTOS CONTAINING MATERIALS IN ACCORDANCE WITH APPLICABLE STATE AND FEDERAL REGULATIONS, SPECIFICATION 02 82 13.00 98 AND THE CONTRACT REQUIREMENTS.

D. SITE SPECIFIC ASBESTOS WORK PLANS MUST BE PROVIDED FOR ALL WORK ASSOCIATED WITH THE IDENTIFIED ASBESTOS CONCRETE PIPES.

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | KM |

REVISIONS

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| DRAWN J. ALLEN | 12/05/11 |
| CHECKED D. TOTH | 12/05/11 |
| SUBMITTED K. RIVERA | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 65681 | |
| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
FORCE MAINS

SWMU - PRL CONTAMINANTS AND ENVIRONMENTAL/ASBESTOS NOTES

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| EN2 | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 8 | |

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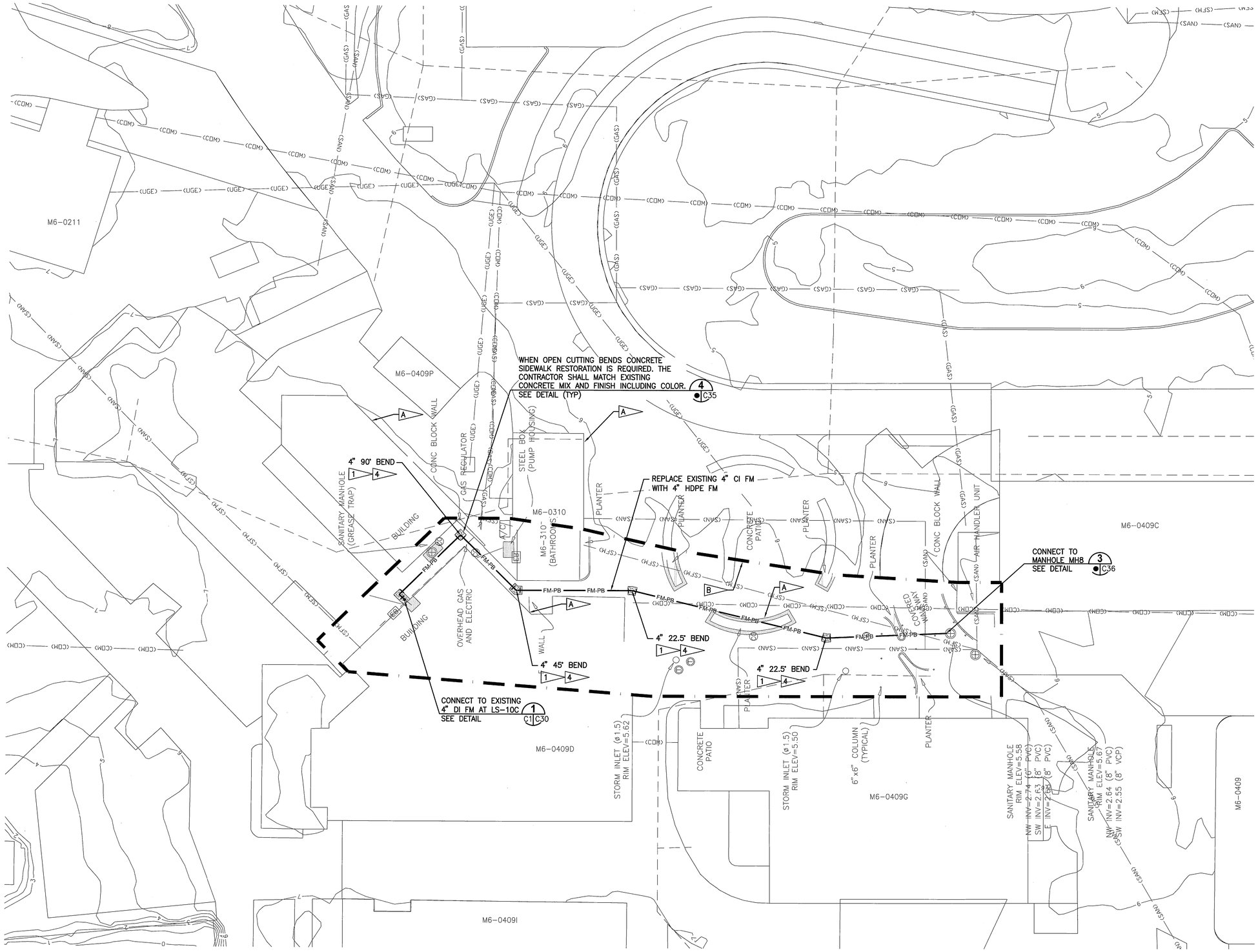
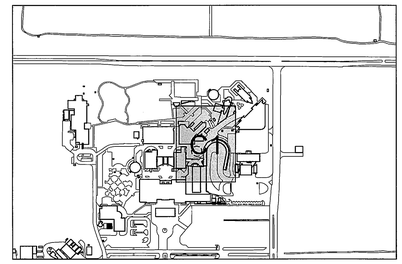



## LS-10C PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'



## KEY MAP

NTS

## GENERAL CIVIL NOTES

1. EXISTING BENDS LESS THAN OR EQUAL TO 45° MAY BE BURSTED THROUGH WITHOUT INSTALLATION OF A REPLACEMENT FITTING IF THE RESULTING BEND IN THE REPLACEMENT PIPE DOES NOT EXCEED THE MANUFACTURERS ALLOWABLE BEND RADIUS. IF THE CONTRACTOR CANNOT MAINTAIN THE ALLOWABLE BEND RADIUS THEN THE FITTING MUST BE REMOVED AND A NEW HDPE FITTING OF LIKE SIZE SHALL BE INSTALLED.
2. CONTRACTOR SHALL INSTALL A PLUG VALVE AT MINIMUM EVERY 750 FEET OF FORCE MAIN INSTALLATION.
3. FULLY GROUTED ABANDONED FORCE MAIN EXTENDED TO 10 FEET BEYOND EDGE OF RAILROAD TRACKS. SEE SPECIFICATIONS FOR GROUT MATERIAL.
4. NOT ALL FITTINGS ARE SHOWN ON DRAWINGS. THE CONTRACTOR SHALL FIELD VERIFY EXISTING BEND DEGREES AND LOCATIONS. THE MINIMUM PIPE COVER MUST BE MAINTAINED. ADD FITTINGS FOR VERTICAL OFFSETS.
5. WATER MAIN CONSTRUCTED UNDER 79K38877 – VOLUME 1.
6. RESTORATION AREAS SHOWN ON PLANS ARE FOR REFERENCE ONLY. FOR BIDDING PURPOSES CONTRACTOR SHALL DETERMINE LIMITS OF CONCRETE, LIMEROCK, ASPHALT, CURB, AND SIDEWALK RESTORATION BASED ON PLANNED INSTALLATION METHOD.
7. LIMIT OF GROUNDWATER CONTAMINATION. CONTRACTOR TO INSTALL RESTRAINED DUCTILE IRON PIPE WITH CHEMICAL COMPATIBLE GASKETS FOR PIPE SIZES 4" AND LARGER, SOCKET WELDED STAINLESS STEEL FOR PIPE SIZES 3" AND SMALLER, AND APPROPRIATE FITTINGS INCLUDING TRANSITION COUPLINGS. COORDINATES ARE APPROXIMATE.
8. PROVIDE THRUST BLOCK PER DETAIL 3 C33

## NOTES

A. VIDEO INSPECTIONS OF ALL STRUCTURES IN THE VICINITY OF WHERE PIPE BURSTING IS EXECUTED SHALL BE PERFORMED BY THE CONTRACTOR BEFORE AND AFTER BURSTING INSTALLATION AS SPECIFIED IN THE CONTRACT DOCUMENTS.

B. SURVEY INFORMATION IS BASED ON LIMITED, BUT BEST AVAILABLE INFORMATION. THERE MAY BE OTHER UNDERGROUND UTILITIES IN THIS AREA THAT ARE NOT INDICATED ON THE SURVEY. CONTRACTOR TO USE CAUTION WHEN PIPE BURSTING AND OPEN CUTTING IN THIS AREA.

THIS SPACE RESERVED

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|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

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| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

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KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 9 | |

C1

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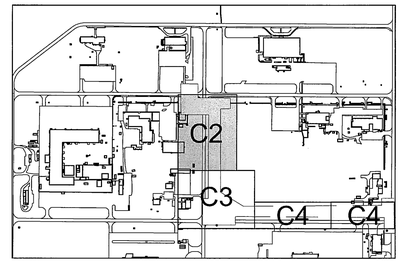


**KEY MAP**
NTS

10" DI WM 5

TYPICAL FM REMOVAL 6 SEE DETAIL C2 C35

10" DI WM 5

UTILITY CONFLICT 1 SEE DETAIL (TYP) C34

5 6" PLUG VALVE C36 SEE DETAIL

6" HDPE FM 2

EXISTING 6" FM AIP

ENLARGED PLAN 11 SEE DETAIL C2 C31

57' FROM EOP

58' FROM EOP

MATCHLINE - SEE C3

2ND STREET

B AVENUE

SANITARY MANHOLE
WET WELL
RIM ELEV=7.08
N INV=2.03 (10" PVC)
S INV=2.19 (10" DIP)
SE INV=1.95 (10" VCP)
W INV=0.98 (10" VCP)
E INV=1.23 (10" VCP)

SANITARY MANHOLE
RIM ELEV=7.68
S INV=2.08 (10" VCP)
S INV=4.98 (4" PVC)
NW INV=2.26 (10" VCP)

SANITARY LIFT STATION
TOP ELEV=7.13

EXISTING 6" HDPE FM

LS-1D

10" DI WM 5

6" DI WM 5

10" DI WM 5

10" DI WM 5

CHILLED WATER VAULT

(ABANDONED) CONC VAULT

RAILROAD

(ABANDONED) CONC TRENCH

ELECTRIC SUBSTATION

TR6-113

TR6-0113 SANITARY LIFT STATION TOP ELEV=6.72

SANITARY SEWER (NEW)

M6-0492

CONCRETE FLUME THROAT ELEV=6.95

EOP 2ND ST

## B AVENUE PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

C2

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | REVISED TYPICAL FM REMOVAL DETAIL CALLOUT | 03/07/12 | |
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | |
| K. MILLER | |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
| PROJ. NO. 96968.3 | | SHEET 10 | |

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MATCHLINE - SEE C2

M6-0539

M6-0589

6" HDPE FM
2

B AVENUE

RAILROAD

TREELINE

72' JACK AND BORE
SEE DETAIL 1 ● C36

1 UTILITY CONFLICT
● C34 SEE DETAIL (TYP)

N: 1522237.4929
E: 766170.1421

61" FROM EOP

6" 90° SWEEP BEND

ABOVE GROUND
GAS W/ REGULATOR
AND PRESSURE SENSOR

6.5' CLF

132' FROM EOP

STORM PIPE
15"x30" CMP
W INV=2.55
E INV=2.55

UTILITY CONFLICT
SEE DETAIL (TYP) 1 ● C34

6" PLUG VALVE
SEE DETAIL 5 ● C36
2

N: 1522154.05
E: 766253.72

(2) 6" 45° BEND

50' FROM EOP

SIGN "STOP AHEAD"

6" HDPE FM
2

HEADWALL
TOP ELEV=6.16

STORM PIPES
(2) 24" RCP
(E PIPE) N INV=4.65
(W PIPE) N INV=4.61

SIGN
"STOP"

3RD ST

EOP

3RD STREET

CONC
PATCH

HEADWALL
TOP ELEV=5.61

HEADWALL
TOP ELEV=5.80

MATCHLINE - SEE C4

C2
C3
C4
C4

N

**KEY MAP**
NTS

## 3RD STREET & B AVENUE PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| DRAWN J. ALLEN | 10/31/11 |
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| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 11 | |

C3

FORM 1-11 (3/76)(C/G 3/94)

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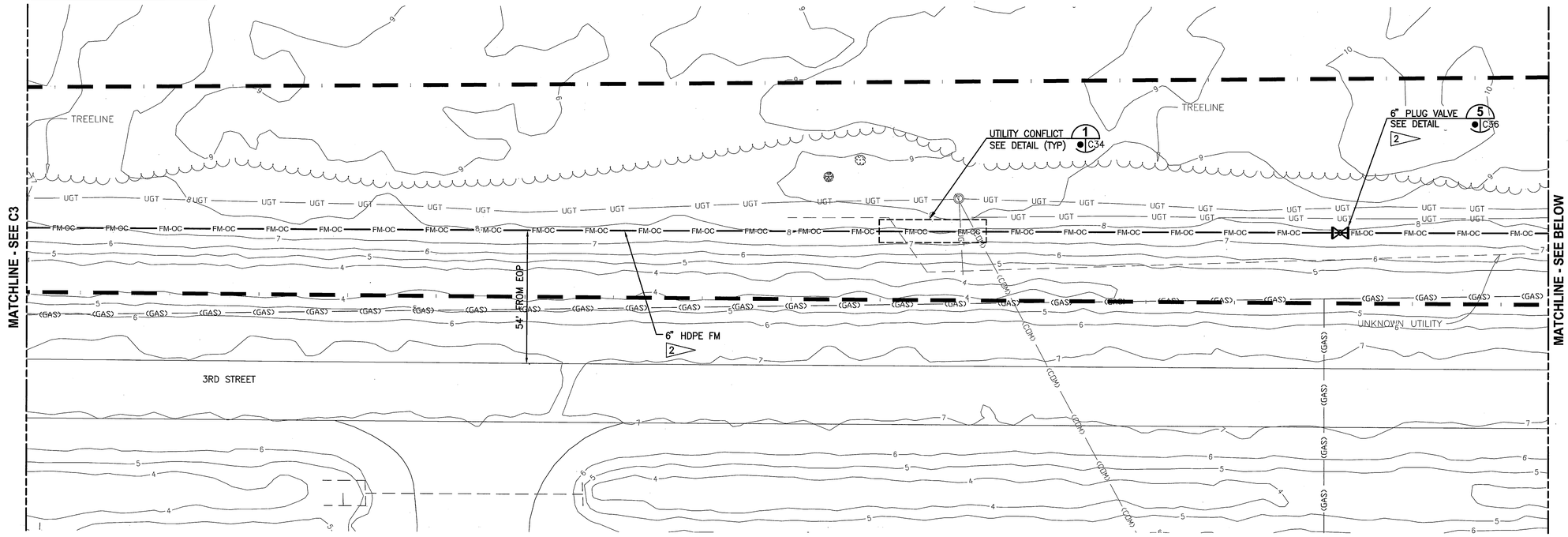
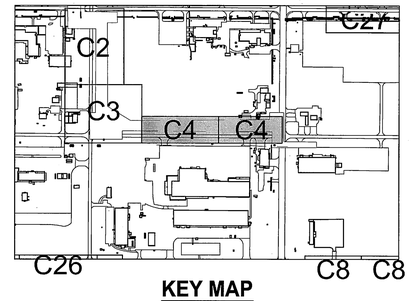


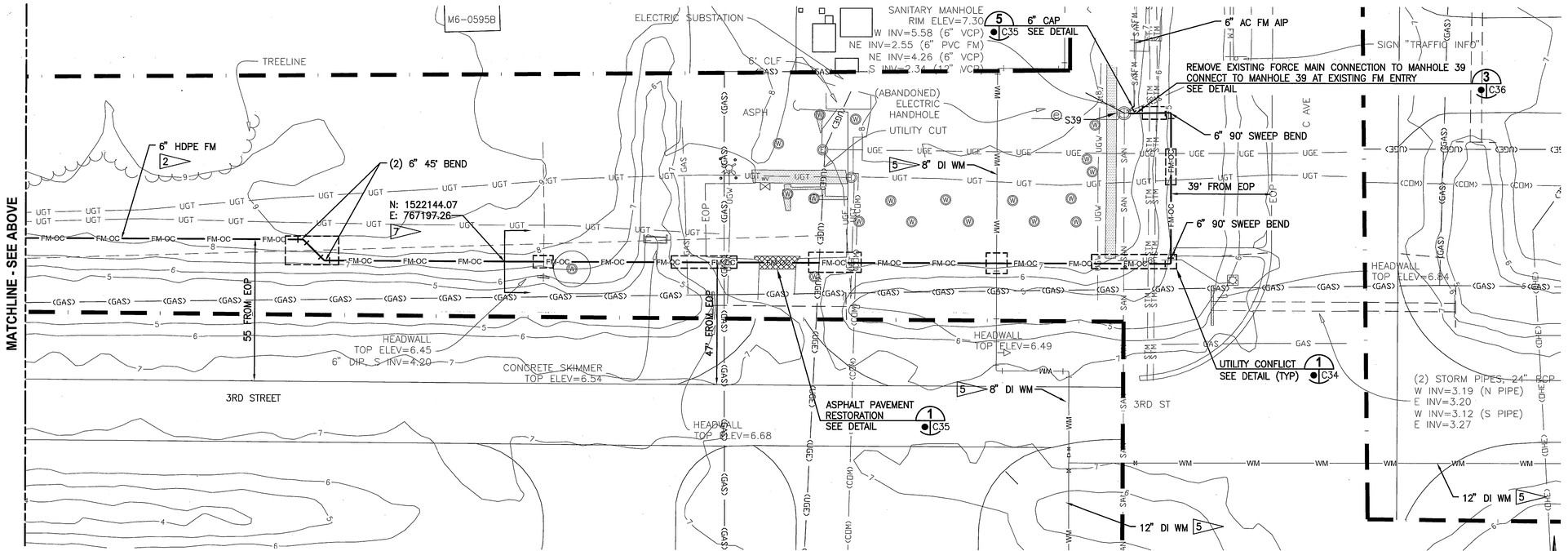

## 3RD STREET PLAN

1"=20'




## KEY MAP

NTS




## 3RD STREET PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

N

C4

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| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL | |
| LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 12 | |

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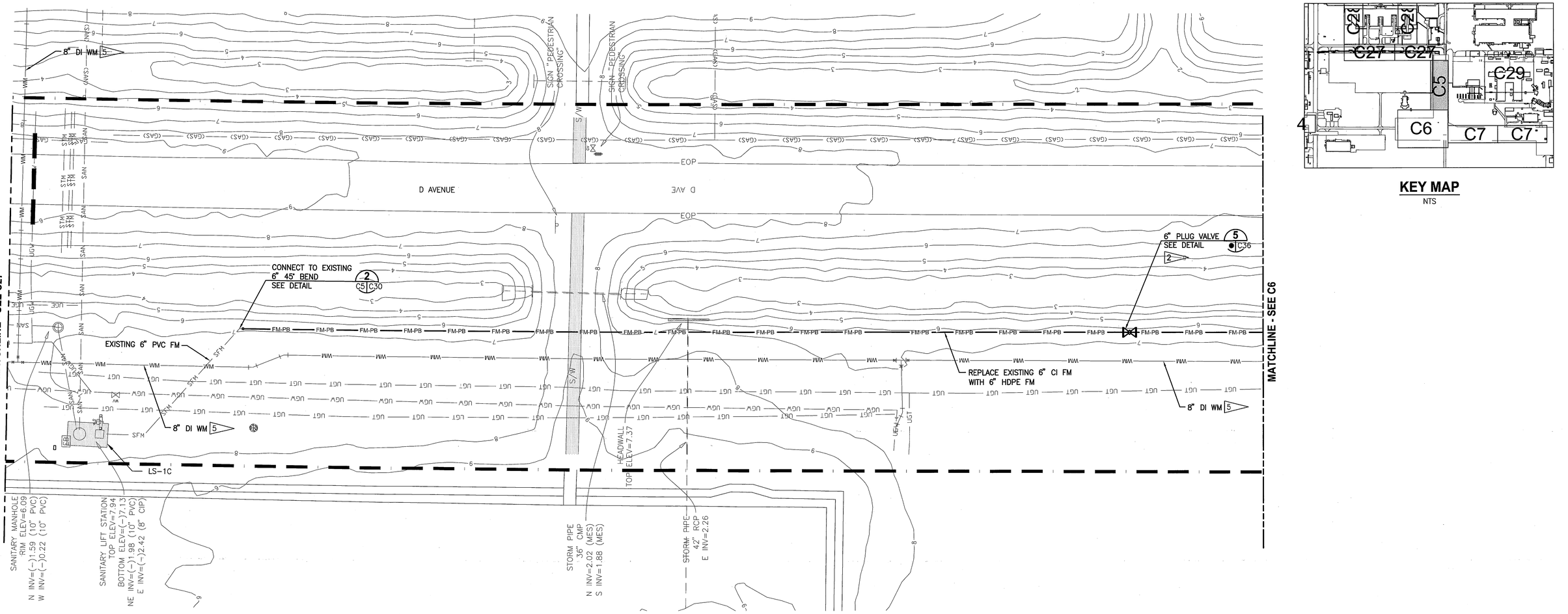


## D AVENUE PLAN
1"=20'




## KEY MAP
NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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3910 S WASHINGTON AVE, SUITE 210, TITUSVILLE, FLORIDA 32780 / (321) 269-2950


| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 13 | |

C5

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MATCHLINE - SEE C5

STORM PIPE
15" PVC
N INV=4.45
S INV=2.66 (MES)

AIR RELEASE CABINET

5 8" DI WM

REPLACE EXISTING 6" CI FM WITH 6" HDPE FM
2

STORM PIPES
(2) 42" RPC
W INV=1.17 (N PIPE)
E INV=1.04
W INV=1.14 (S PIPE)
E INV=1.03

D AVENUE

12" DI WM 5

3RD STREET

SIGN "SPEED"

HEADWALL
TOP ELEV=6.17

3RD ST

6" DI WM 5

SIGN
"STOP/STREET"

UTILITY CUT

CONNECT TO MANHOLE S16
3 C36 SEE DETAIL

5 6" PLUG VALVE
C36 SEE DETAIL

HEADWALL TOP ELEV=5.96

6" 45° BEND
1 4

REMOVE EXISTING FITTINGS
INSTALL 6"x6"x6" WYE, 6"x4" REDUCER, 4" 90° SWEEP BEND
4

S16

REPLACE EXISTING 6" CI FM WITH 6" HDPE FM

STEAM VAULT W/
Ø3' ACCESS PIPE
TOP ELEV=6.15

2 C6 C36 STUB-OUT FOR FUTURE CONNECTION SEE DETAIL
N: 1522007.42
E: 768974.75

5 4" PLUG VALVE
C36 SEE DETAIL

CONCRETE TRENCH

SANITARY MANHOLE
RIM ELEV=7.70
W INV=4.10 (10" VCP)
E INV=4.18 (FM 6" PVC)
NE INV=5.46 (FM 4" HDPE)

STORM PIPE
24" RCP
(N PIPE) W INV=3.43
E INV=3.39
(S PIPE) W INV=3.47
E INV=3.36

D AVE

HEADWALL
TOP ELEV=5.92

CONCRETE TRENCH

REMOVE EXISTING 90° BEND
INSTALL 90° SWEEPBEND
1 4

REPLACE EXISTING 4" CI FM
WITH 4" HDPE FM
2

MATCHLINE - SEE C7

KEY MAP
NTS
C4 C5 C6 C7 C8 C9 C27 C29

## 3RD STREET & D AVENUE PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

N

C6

THIS SPACE RESERVED

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|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 14

FORM 1-11 (3/76)(C/G 3/94)

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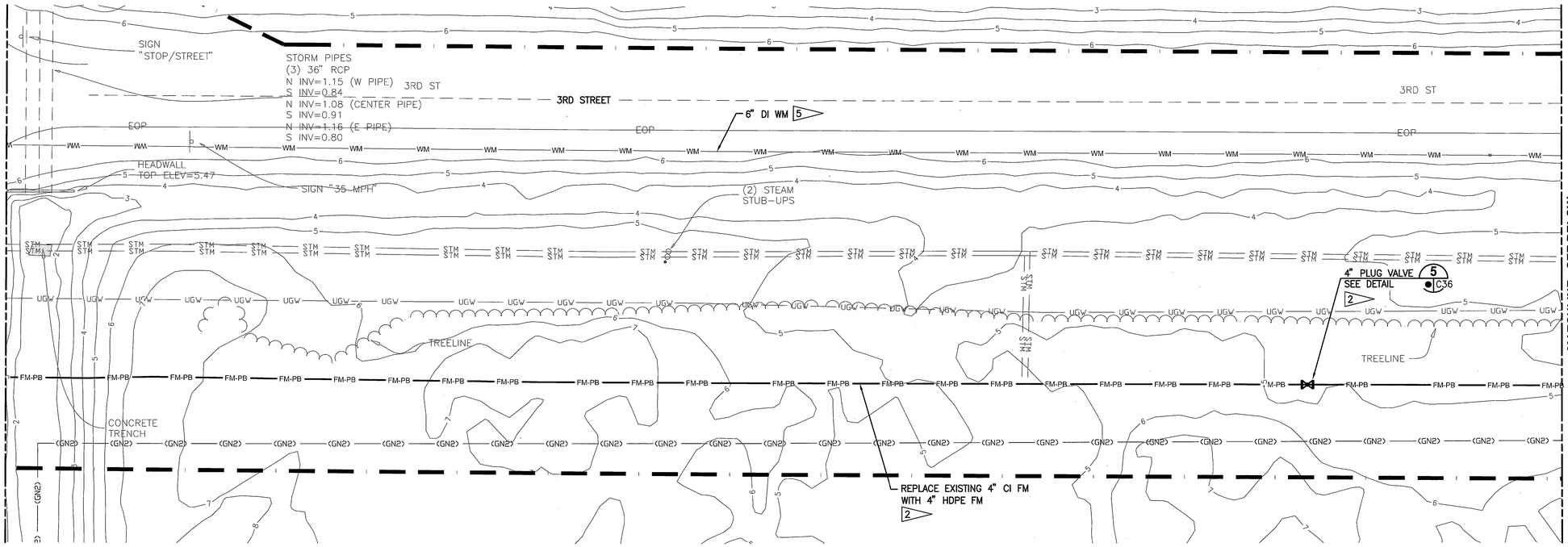
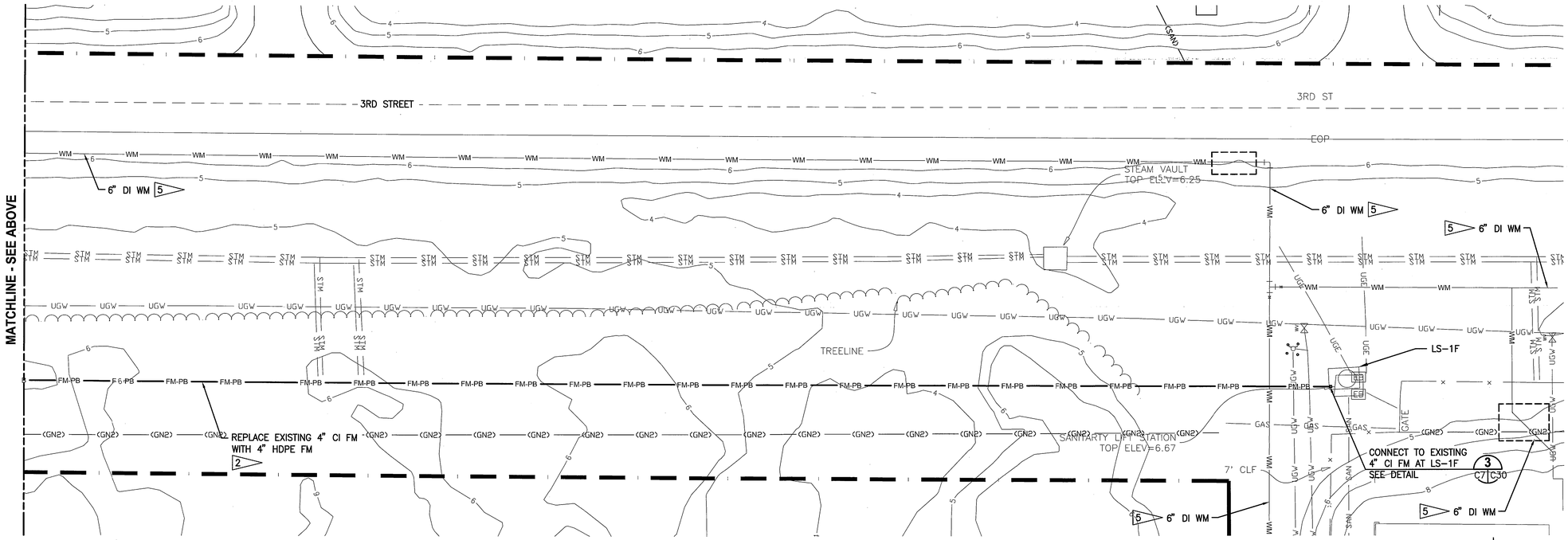


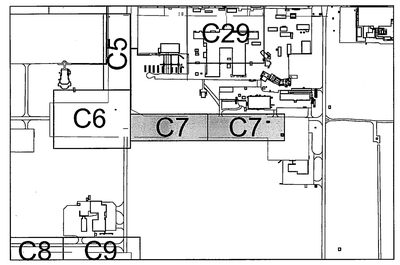

## 3RD STREET PLAN

1"=20'




## 3RD STREET PLAN

1"=20'




## KEY MAP

NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | KM |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 15 | |

C7

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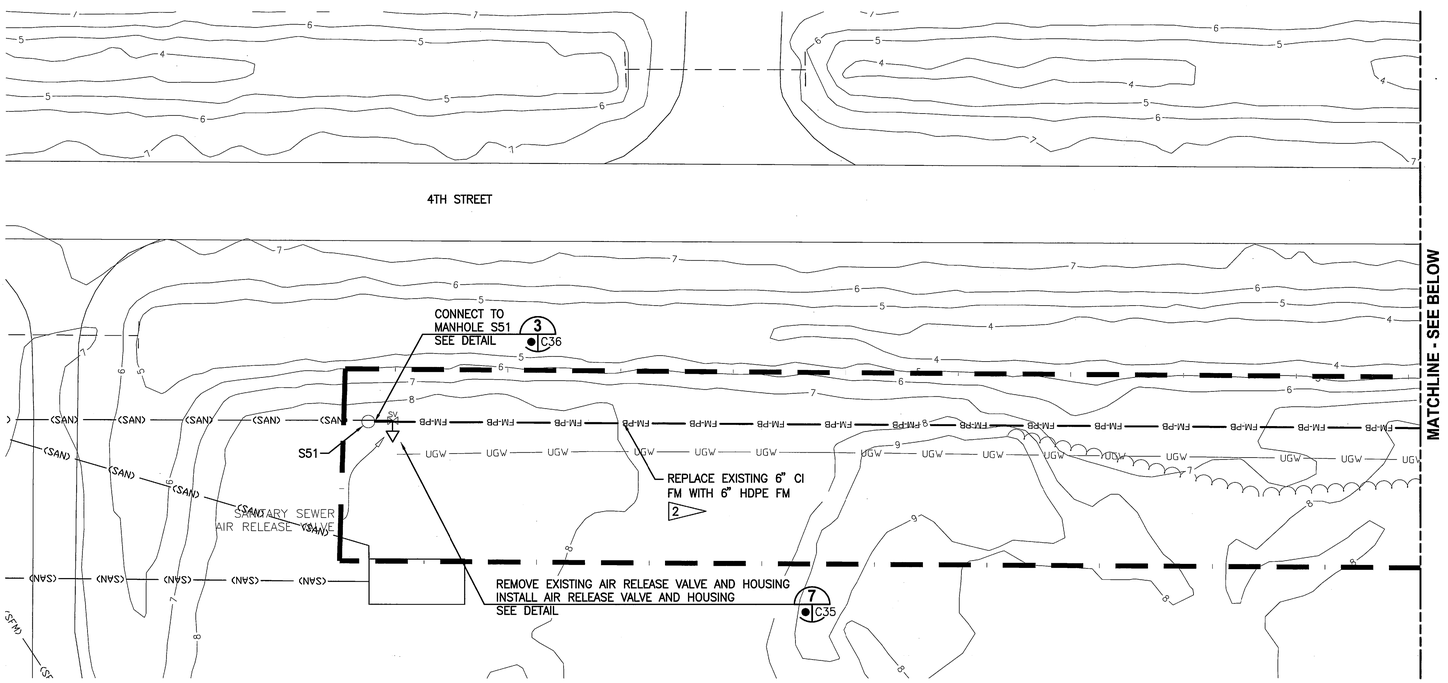
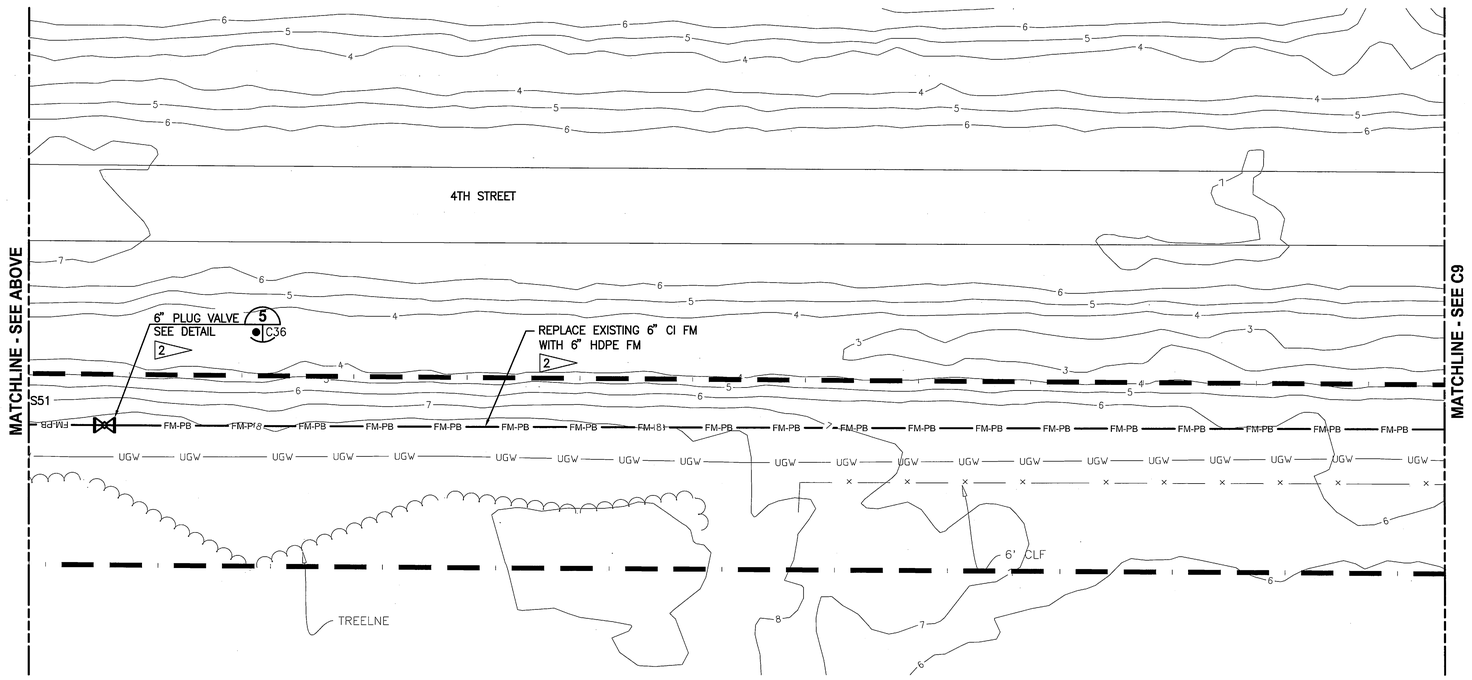
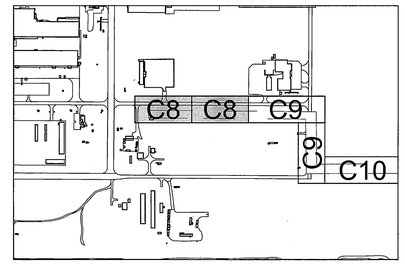



## 4TH STREET PLAN
1"=20'




## 4TH STREET PLAN
1"=20'




## KEY MAP
NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

N

C8

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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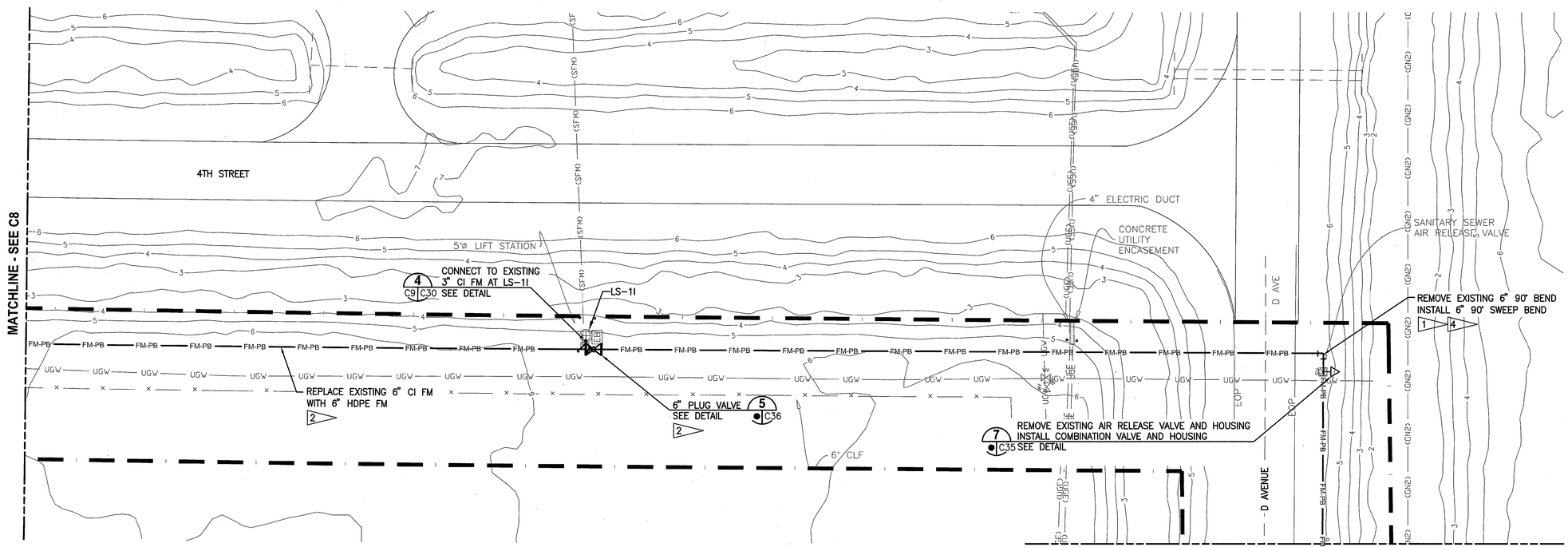
# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

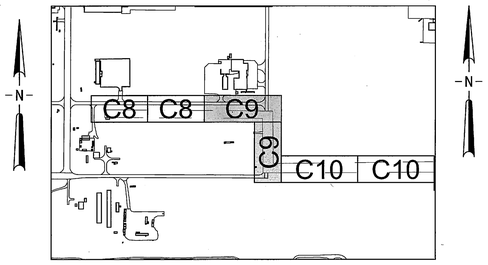
| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 16 | |

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.



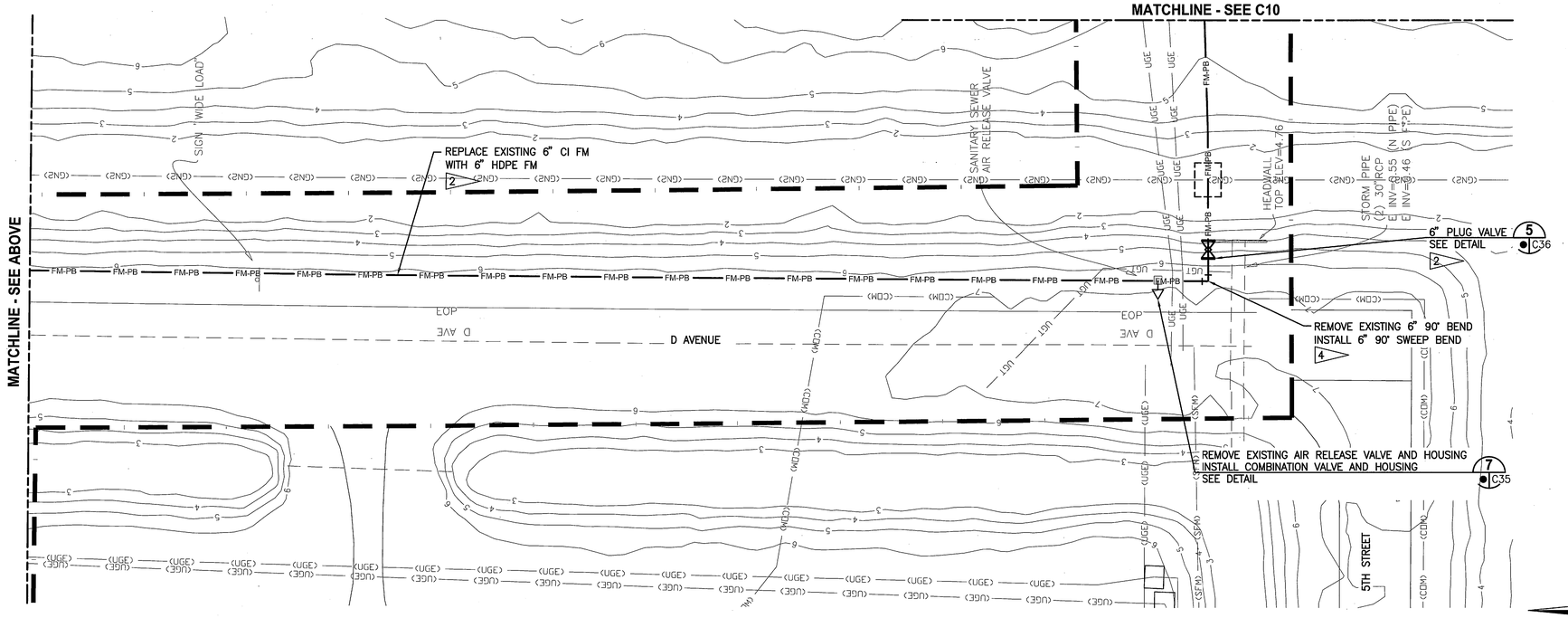

## 4TH STREET & D AVENUE PLAN

1"=20'




## KEY MAP

NTS




## D AVENUE PLAN

1"=20'

GRAPHIC SCALE

0 10 20 40

SCALE IN FEET

1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | | DATE |
|---|---|---|
| DRAWN | J. ALLEN | 10/31/11 |
| CHECKED | M. CLARK | 10/31/11 |
| SUBMITTED | R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | | |
| APPROVED | M. CLARK | 10/31/11 |
| | K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 17

C9

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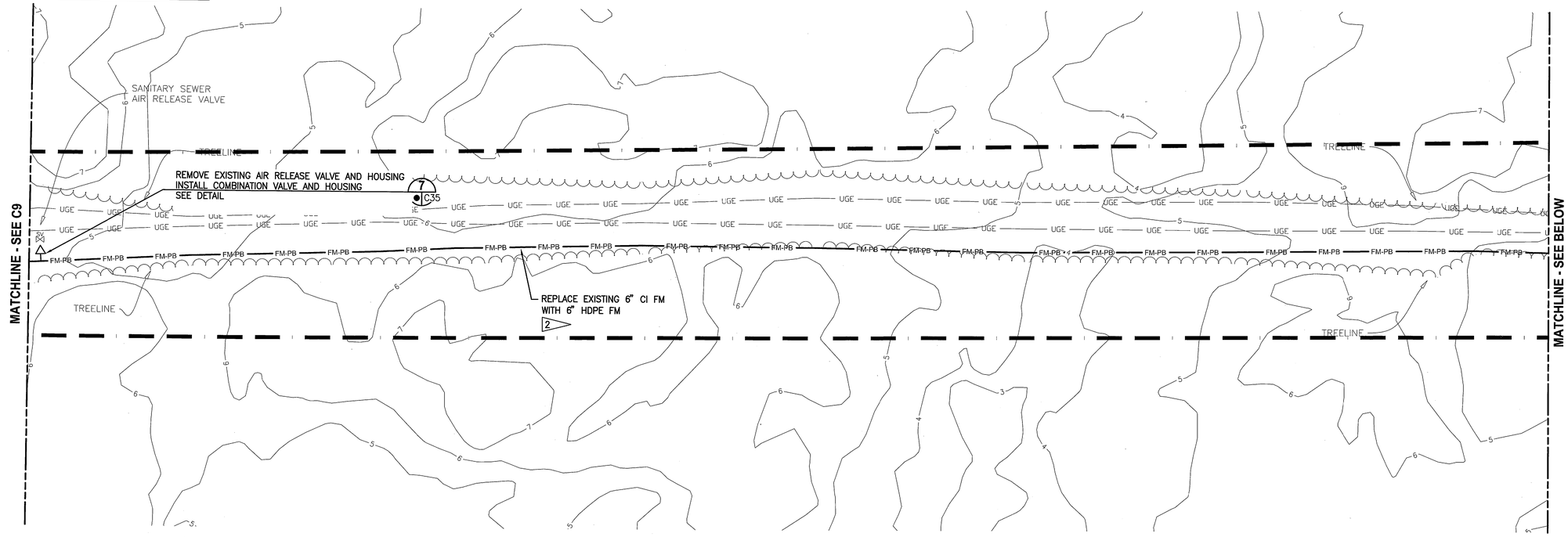
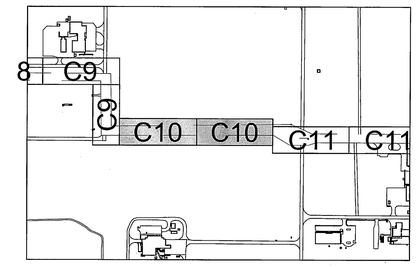


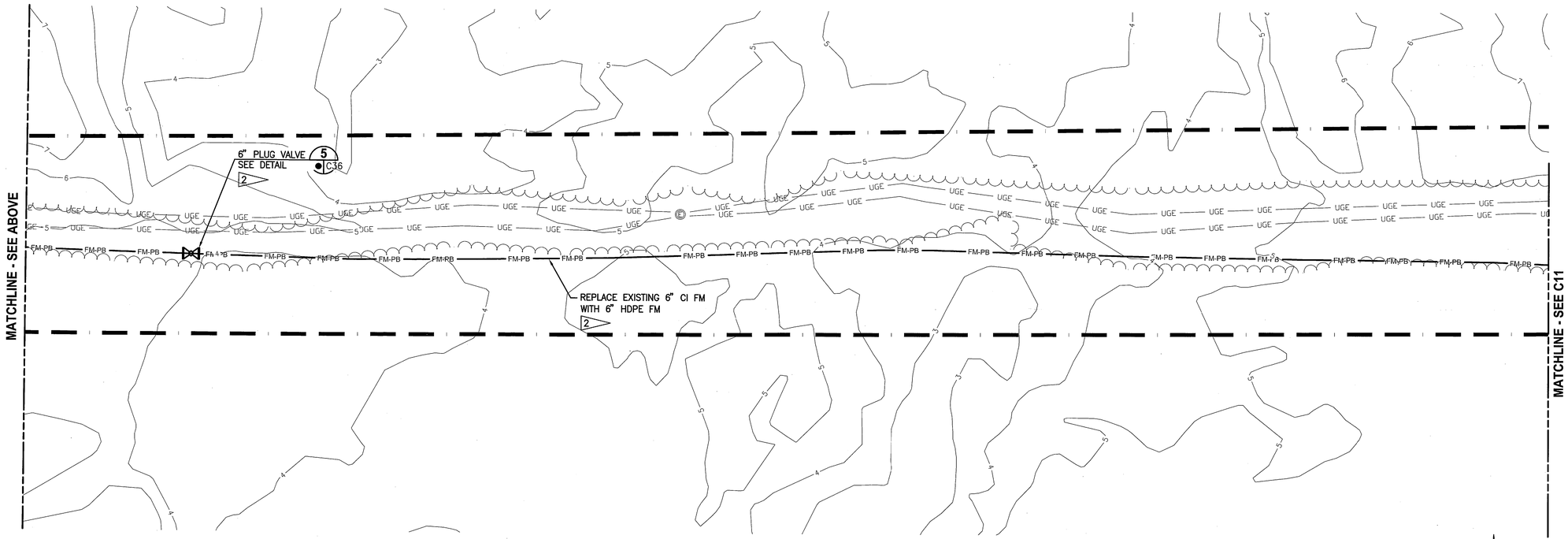

## 5TH STREET PLAN

1"=20'




**KEY MAP**

NTS




## 5TH STREET PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1" =20'

N

C10

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 18 | |

C FORM 1-11 (3/76)(C/G 3/94)

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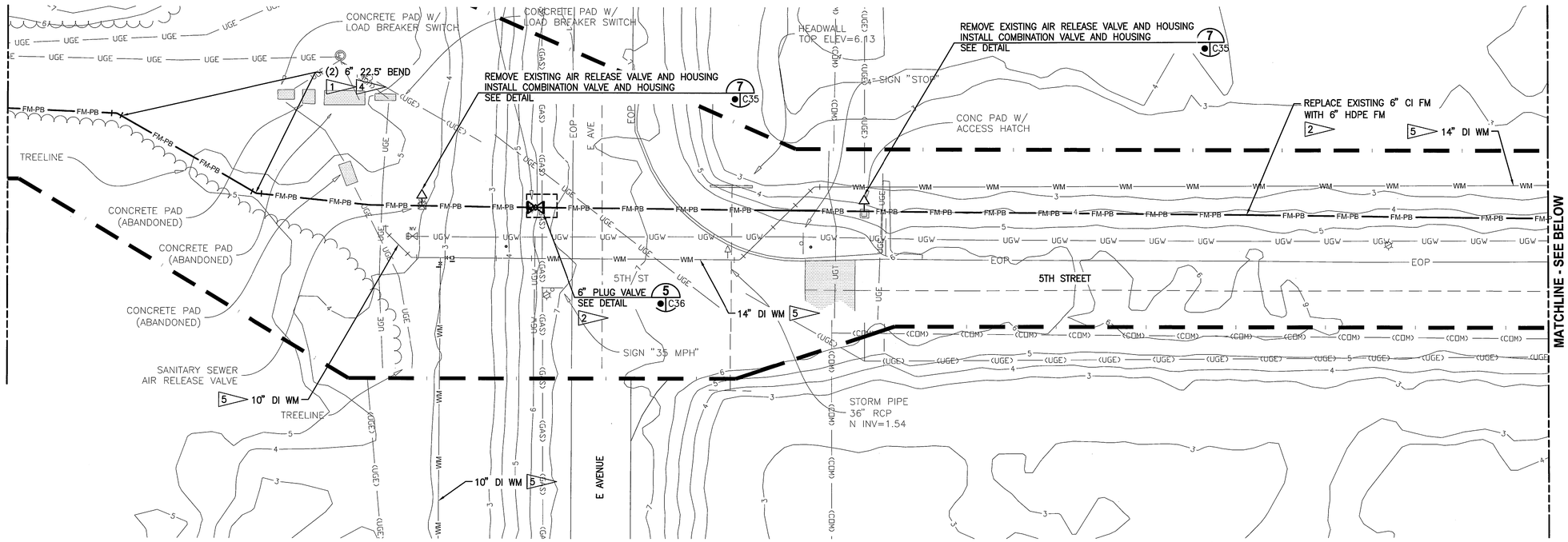
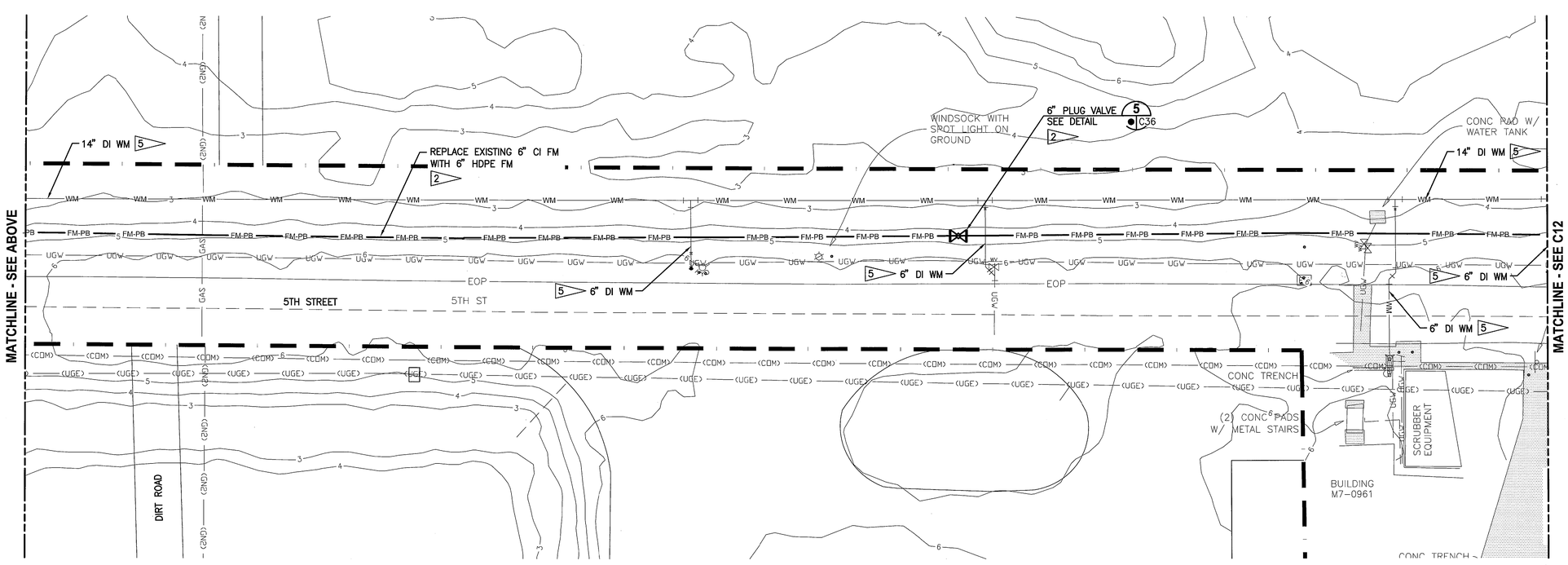



## 5TH STREET & E AVENUE PLAN

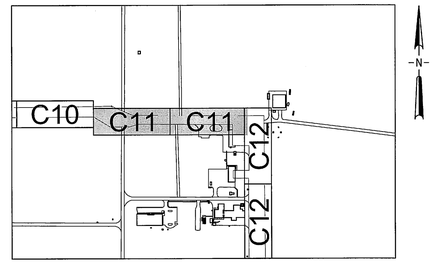
1"=20'




## 5TH STREET PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'




KEY MAP
NTS

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | kpa |

REVISIONS

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3910 S WASHINGTON AVE, SUITE 210, TITUSVILLE, FLORIDA 32780 / (321) 269-2950


| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 12/05/11 |
| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| C11 | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 19 | |

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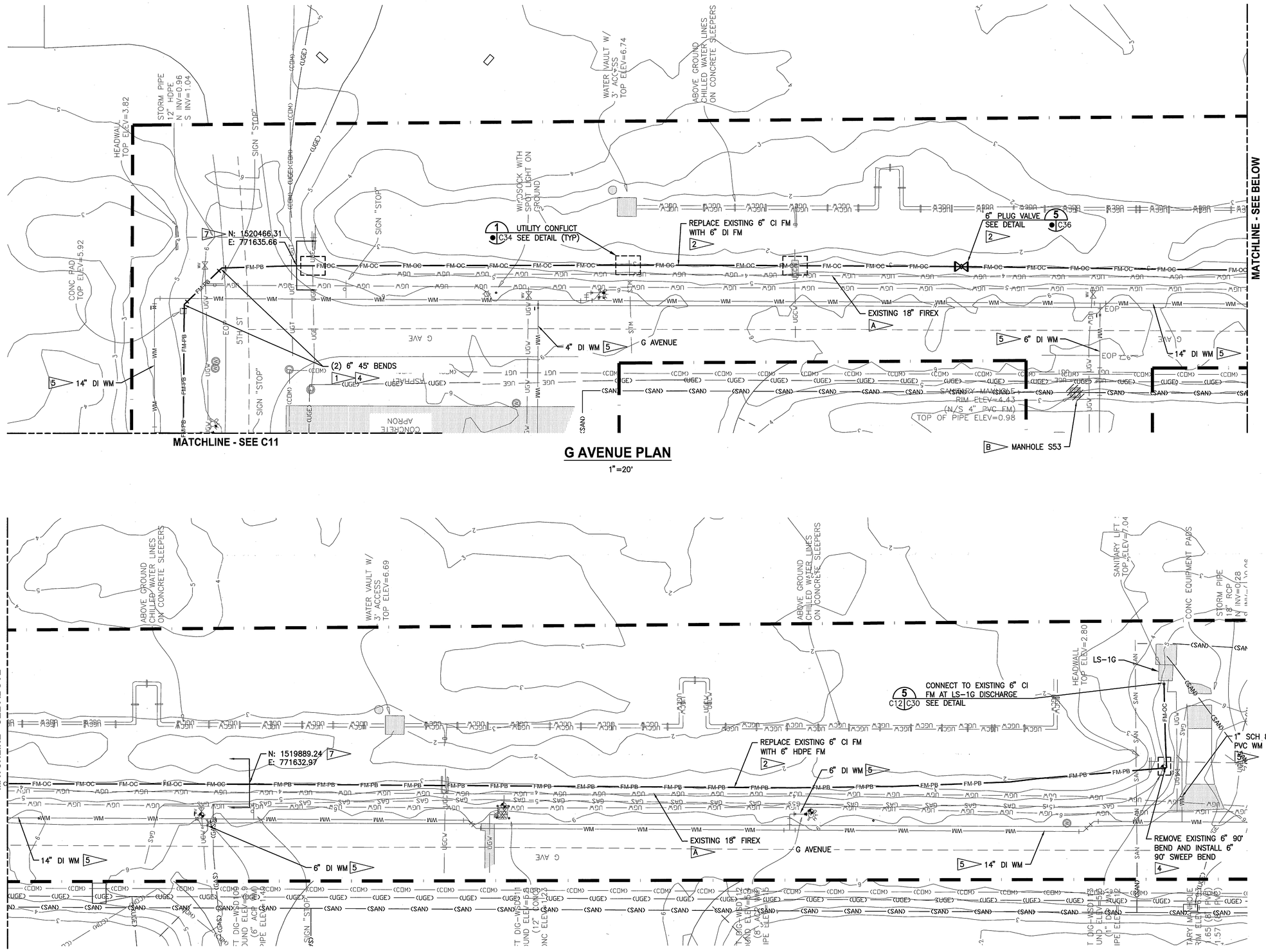


## G AVENUE PLAN
1"=20'




## KEY MAP
NTS

### NOTES

A. FIREX LINES ARE GENERALLY KEPT AT 170–200 PSI. CONTRACTOR IS RESPONSIBLE FOR TAKING PRECAUTIONS AS NECESSARY TO PROTECT ALL EXISTING MAN–MADE STRUCTURES INCLUDING BUT NOT LIMITED TO THE FIREX SYSTEM.

B. CONTRACTOR TO REMOVE TOP CONCRETE SECTION OF MANHOLE AND METAL MANHOLE COVER. CONTRACTOR TO PUNCH (2) 1' DIAMETER HOLES IN BOTTOM OF MANHOLE. CONTRACTOR TO BACK–FILL MANHOLE IN 8" LIFTS TO A 90% COMPACTION. CONTRACTOR RESPONSIBLE FOR MAINTAINING EXISTING GRAVITY PIPES AND RESPONSIBLE FOR REPAIRING ANY DAMAGE AT NO COST TO THE GOVERNMENT.




## G AVENUE PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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3910 S WASHINGTON AVE, SUITE 210, TITUSVILLE, FLORIDA 32780 / (321) 269-2950

| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 20 | |

C12

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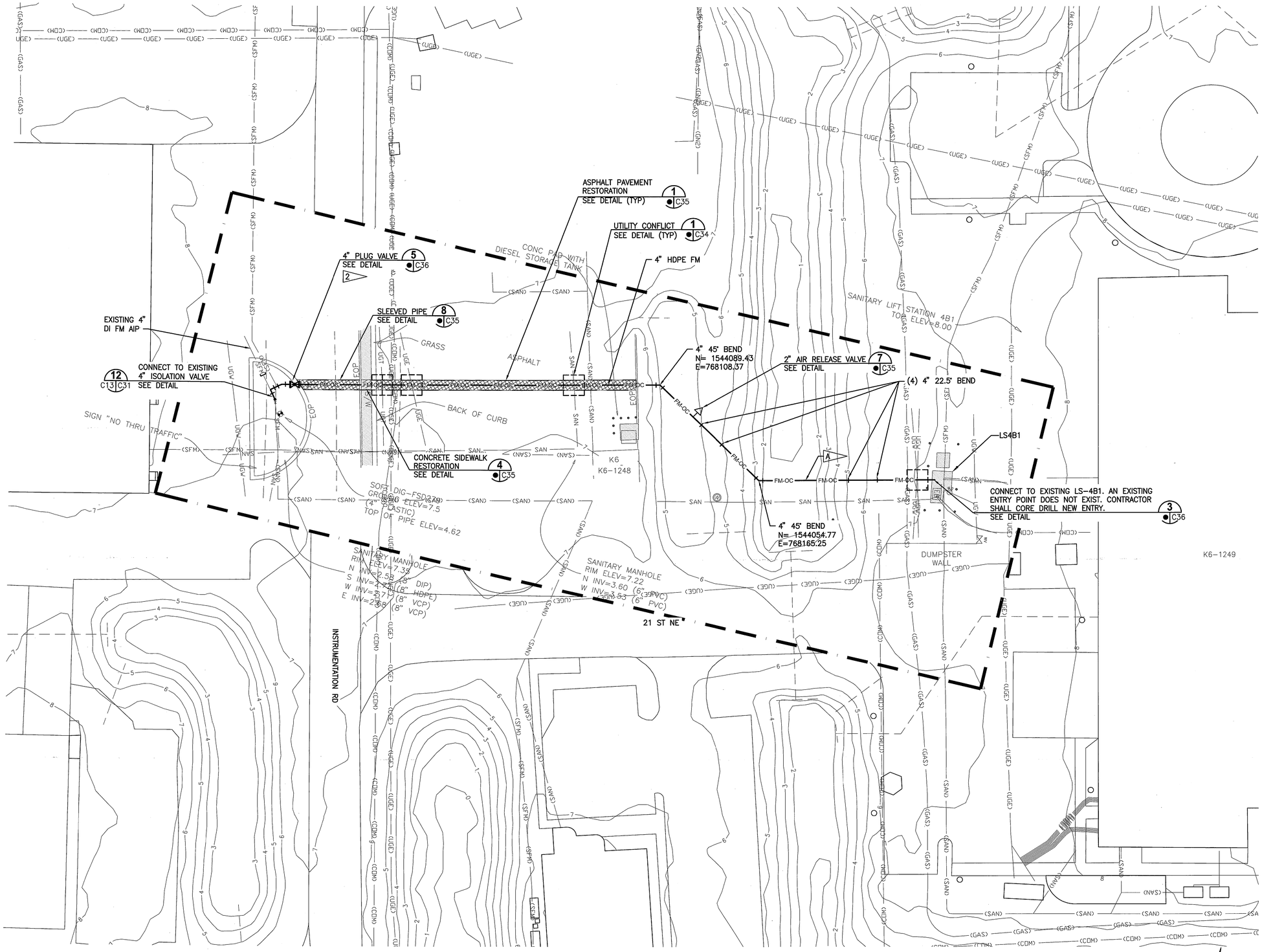
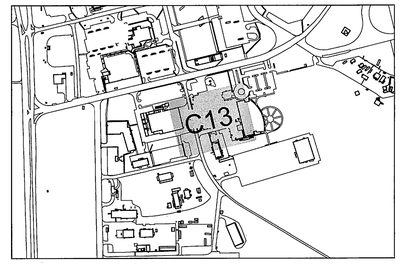



## 21ST STREET PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'




## KEY MAP
NTS

**NOTES**

A WET DITCH CROSSING. ALL WORK SHALL MEET THE REQUIREMENTS OF THE ENVIRONMENTAL RESOURCE PERMIT.

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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JONES EDMUNDS
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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 21 | |

C13

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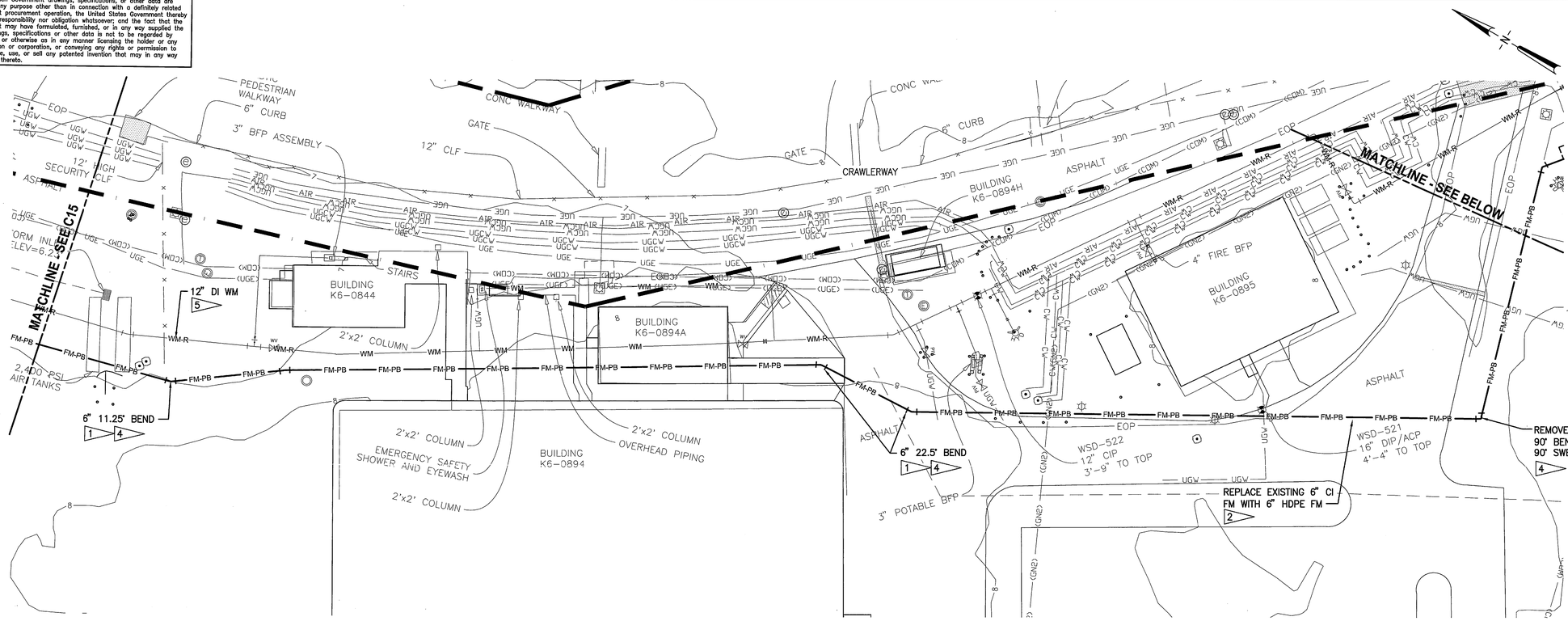
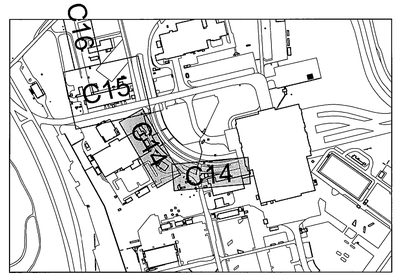



## SAFE HAVEN ROAD PLAN

1"=20'




## KEY MAP

NTS

## SAFE HAVEN ROAD PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

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| SIGNATURES | DATE |
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| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 22 | |

C14

SC FORM 1-11 (3/76)(C/G 3/94)

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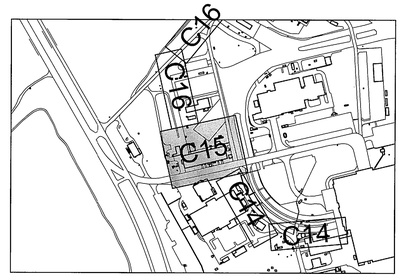
MATCHLINE - SEE C16

UNKNOWN UTILITY
UNKNOWN UTILITY
DIRT DRIVE
UNKNOWN UTILITY
UNKNOWN UTILITY
CONC PAD FOR STAIRS
CONC PAD
CONC PAD
BLDG TANK WALL
CONC DOOR PAD
SOFT DIG-FSD280 GROUND ELEV=8.4 (NO INFO)
3' RETAINING WALL
PORTABLE SHED
PORTABLE SHED
ASPH
GROUNDING ROD
CONC UTILITY VAULT
(2) CONC DOOR PADS
CONCRETE TOWAY
CONCRETE TOWAY
CONCRETE TOWAY
CONC HEADWALL TOP ELEV=7.95
STORM PIPE 30" RCP W INV=2.12
STORM INLET TOP ELEV=6.82 30"RCP, W INV=2.38 30"RCP, E INV=2.49
STORM INLET TOP ELEV=6.97 30"RCP, W INV=2.72 30"RCP, E INV=2.72
STORM INLET TOP ELEV=7.20 30"RCP, W INV=3.00 30"RCP, E INV=3.06
STORM INLET TOP ELEV=7.03 30"RCP, W INV=3.23 30"RCP, E INV=3.28
STORM INLET TOP ELEV=7.05 30"RCP, W INV=3.37 30"RCP, E INV=3.50
STORM MANHOLE RIM ELEV=7.52 30" RCP, W INV=3.43 24"x36" RCP, S INV=3.50
SANITARY LIFT STATION #4A1
TOP ELEV=8.06
BOTTOM ELEV=0.04
N INV=1.70 (6" CIP)
E INV=3.71 (4" CIP)
S INV=2.89 (4" CIP)
W INV=2.98 (4" PVC FM)
7' CLR
LS-4A
LS-4A1
K6-0742
K6-0792
K6-0793
K6-0794
K6-0794A
K6-0794B
BLDG K6-795
BLDG K6 795
AIR HANDLER UNIT
ELECTRIC SUBSTATION
RAMP DOOR
RAMP
CURB
CRAWLER WAY
CONC PAD WITH (4) BLOW-OFF VALVES (4) BOLLARDS
6" CURB
SIGN "NO PARKING"
SIGN "15 MPH"
(2) SIGNS "HANDI-CAP PARKING"
GROUNDING ROD
GROUNDING ROD
GROUNDING ROD
EXISTING FM TO LS-4F
CONNECT TO BELOW GRADE 90° CI BEND AT LS-4A INLET SEE DETAIL 7 C15 C51
REMOVE EXISTING 4" 45° BEND INSTALL 4" 45° BEND 1 4
REPLACE EXISTING 4" CI FM WITH 4" HDPE FM 2
REMOVE EXISTING 6"x6"x6" WYE INSTALL 6"x6"x6" WYE
REMOVE EXISTING 6" 90° BEND INSTALL 6" 90° SWEEP BEND 4
REPLACE EXISTING 6" CI FM WITH 6" HDPE FM 2
6" 22.5° BEND 1 4
(1) 6" 45° BEND
(1) 6" 22.5° BEND 1 4
5 C36 PLUG VALVE SEE DETAIL 2
5 C36 6" PLUG VALVE SEE DETAIL 2
5 C36 PLUG VALVE SEE DETAIL
12" DI WM 5
A
FM-PB
WM-R
UGW
UGE
UGT
(SAN)
(SFM)
(GN2)
(CDM)
(UGE)
(WM)
(COM)
(RED)
(SPH)
(SSP)
(HDSP)

## LS-4A PLAN
1" =20'

MATCHLINE - SEE C14

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1" =20'




## KEY MAP
NTS

## NOTES
A CONTRACTOR TO REMOVE EXISTING 6" CI FM OUT OF EXISTING 15" SLEEVE. CONTRACTOR TO REUSE EXISTING SLEEVE TO INSTALL APPROXIMATELY 95' OF 6" HDPE FM.

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | KMC |

REVISIONS

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| ST of LICENSURE: FL LICENSE NO: 69875 | |
| M. CLARK | 12/05/11 |
| K. MILLER | 12/15/11 |

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JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 23

C15

C FORM 1-11 (3/76)(C/G 3/94)

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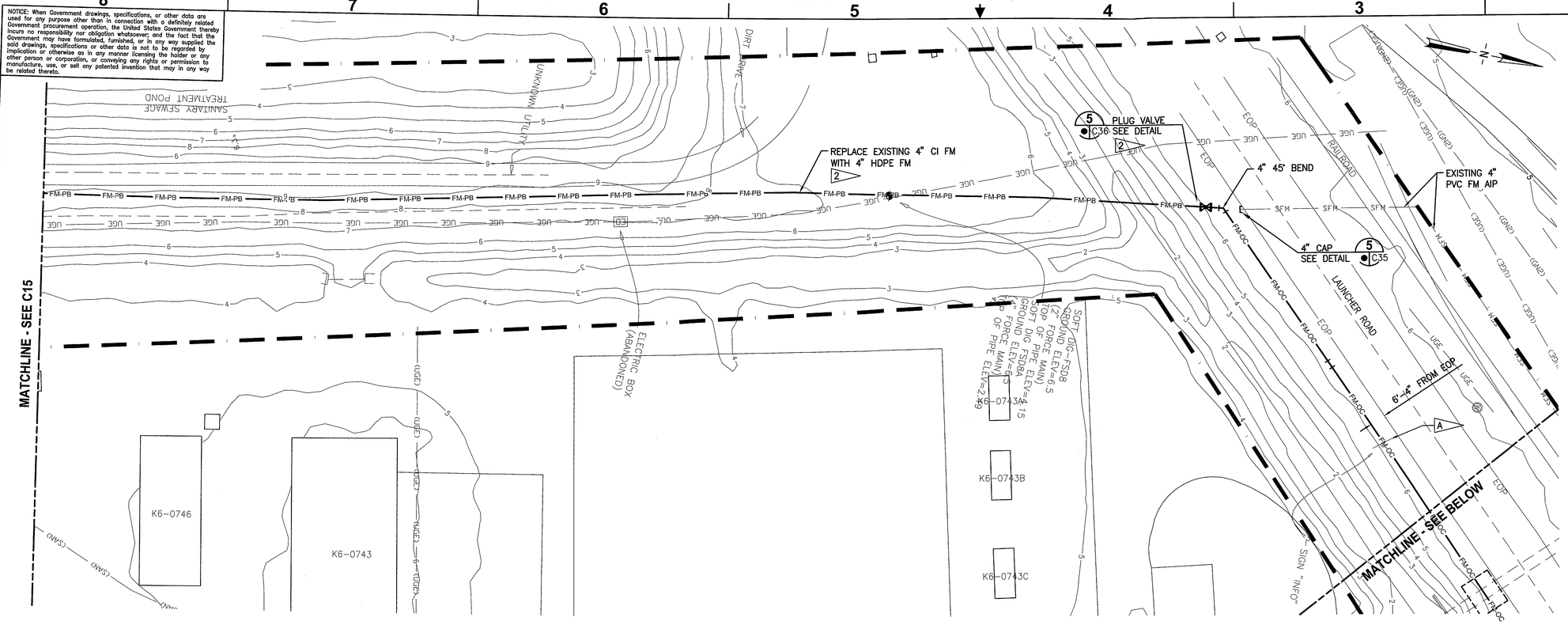
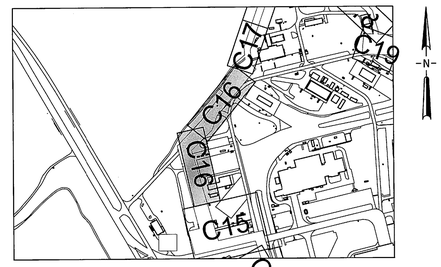



## LAUNCHER ROAD PLAN

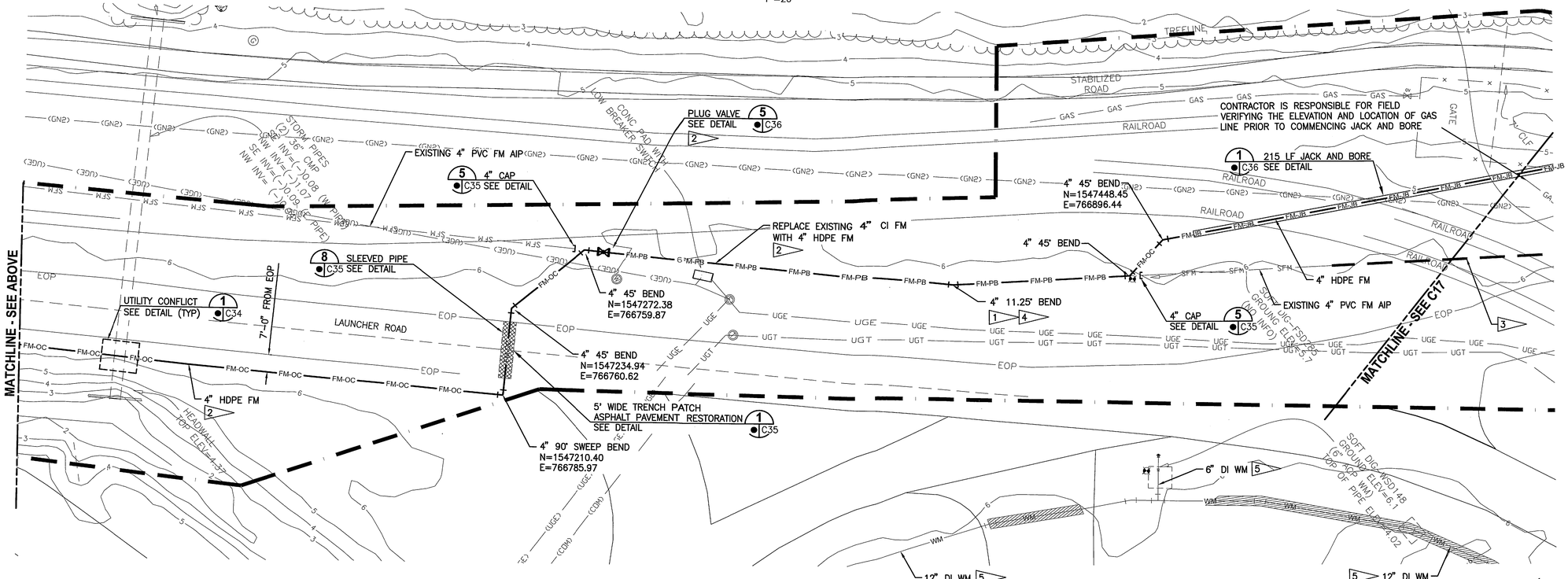
1"=20'




KEY MAP
NTS

**NOTE:**

A REMOVE AND RESET SIGN




## LAUNCHER ROAD PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| K. MILLER | 12/5/11 |

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KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 24 | |

C16

FORM 1-11 (3/78)(C/C 3/94)

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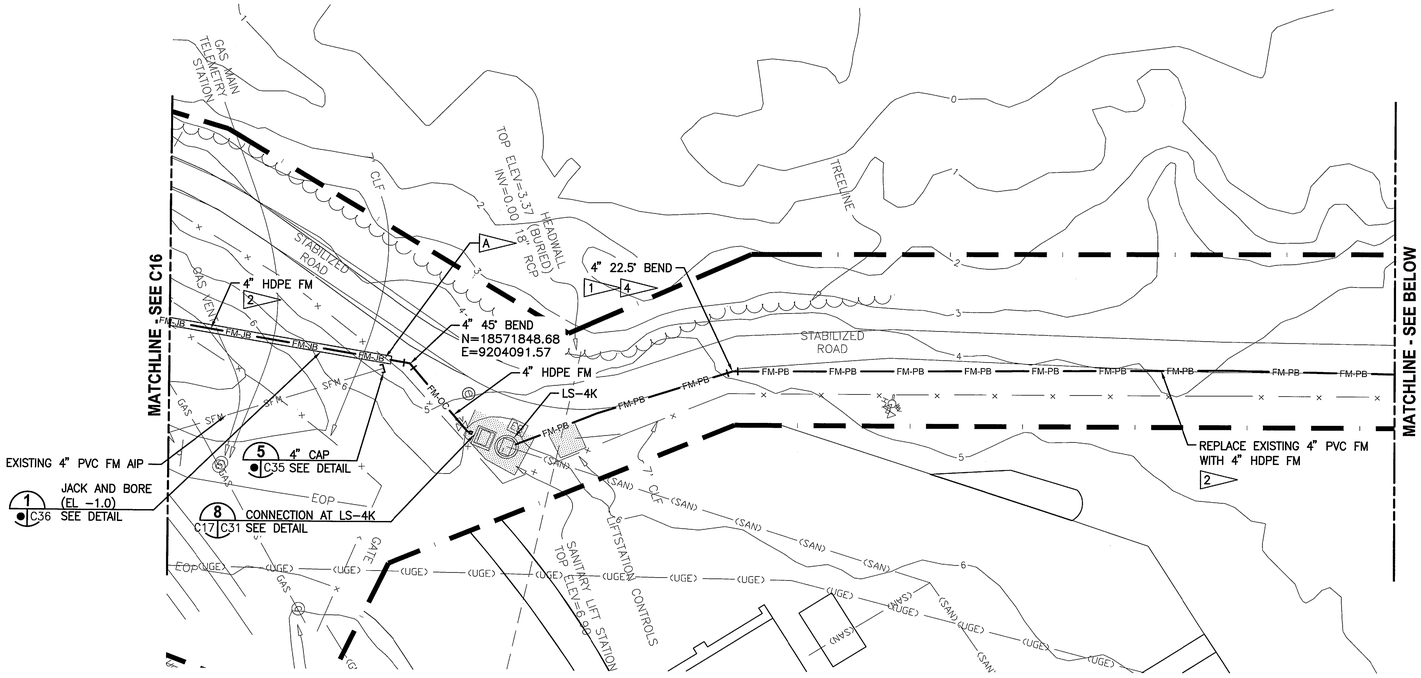
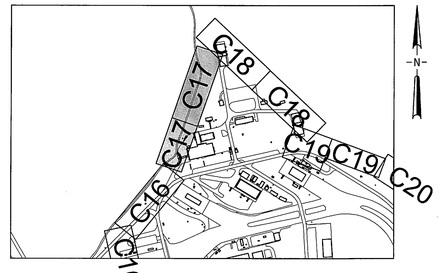



## LAUNCHER ROAD PLAN

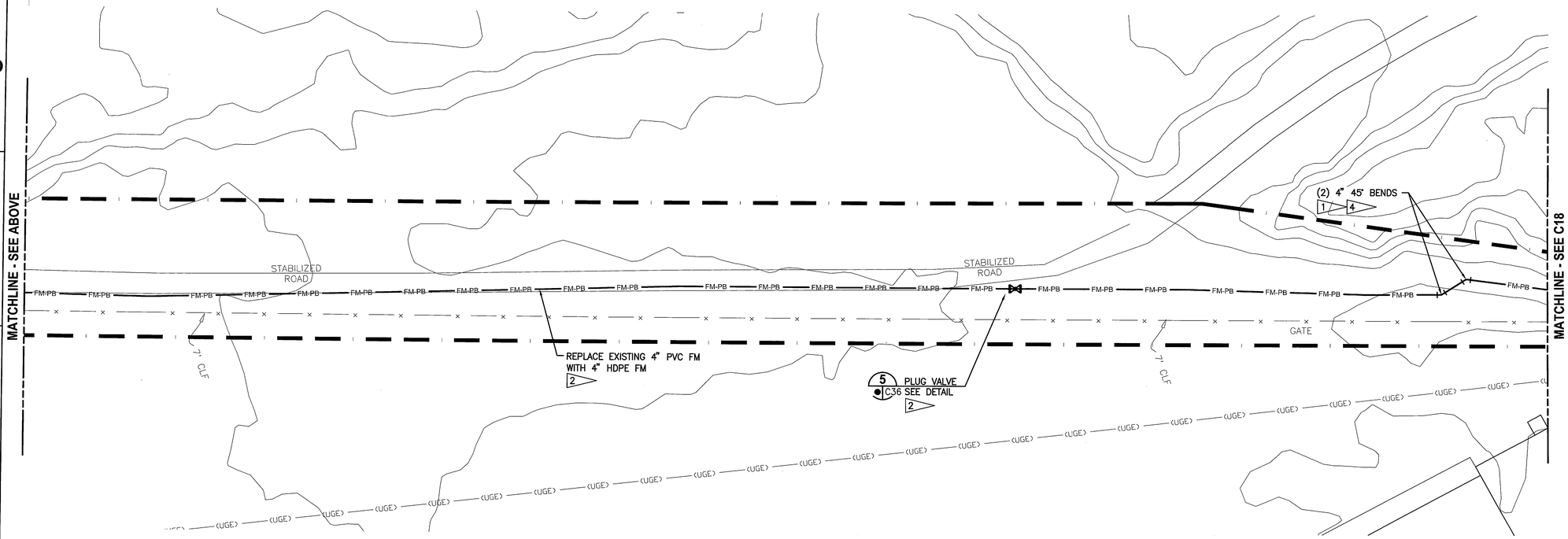
1"=20'




**KEY MAP**
NTS

**NOTE:**

A — REMOVE AND RESET FENCING.




## LAUNCHER ROAD PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| SIGNATURES | DATE |
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| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 25

C17

C FORM 1-11 (3/76)(C/G 3/94)

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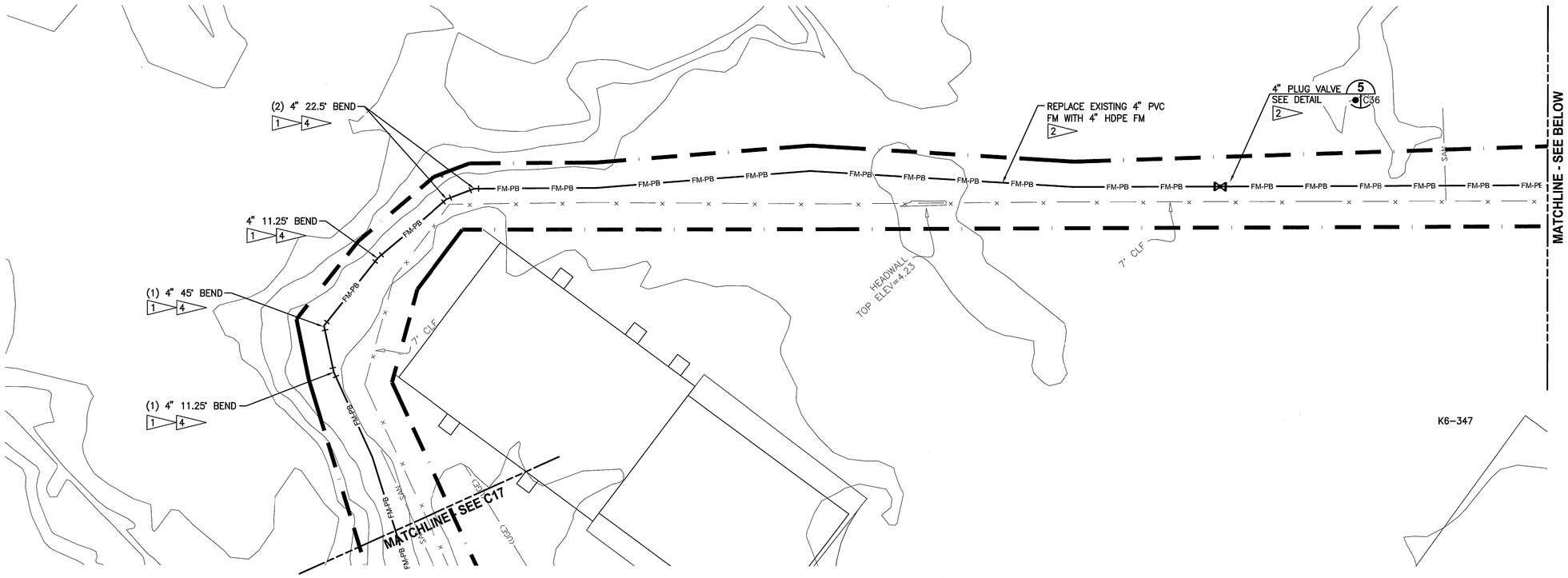
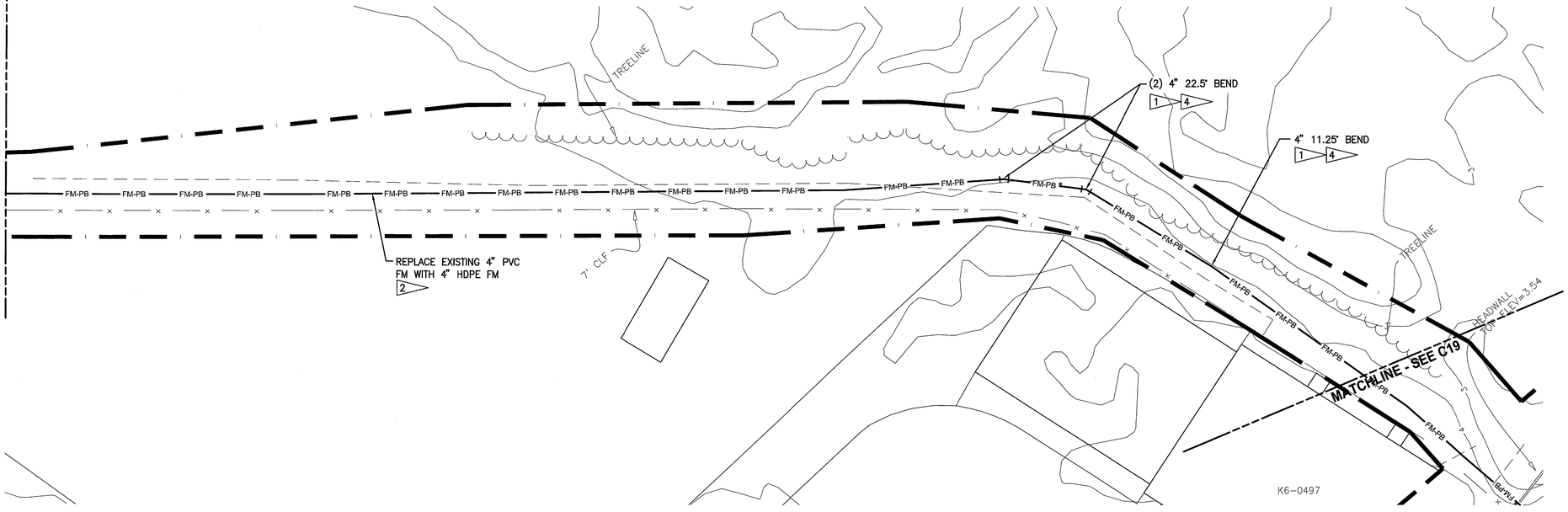



## FORCE MAIN PLAN
1"=20'

**KEY MAP**
NTS




## FORCE MAIN PLAN
1"=20'

**GRAPHIC SCALE**
0 10 20 40
SCALE IN FEET
1"=20'

C18

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| M. CLARK | 12/05/11 |
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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 26 | |

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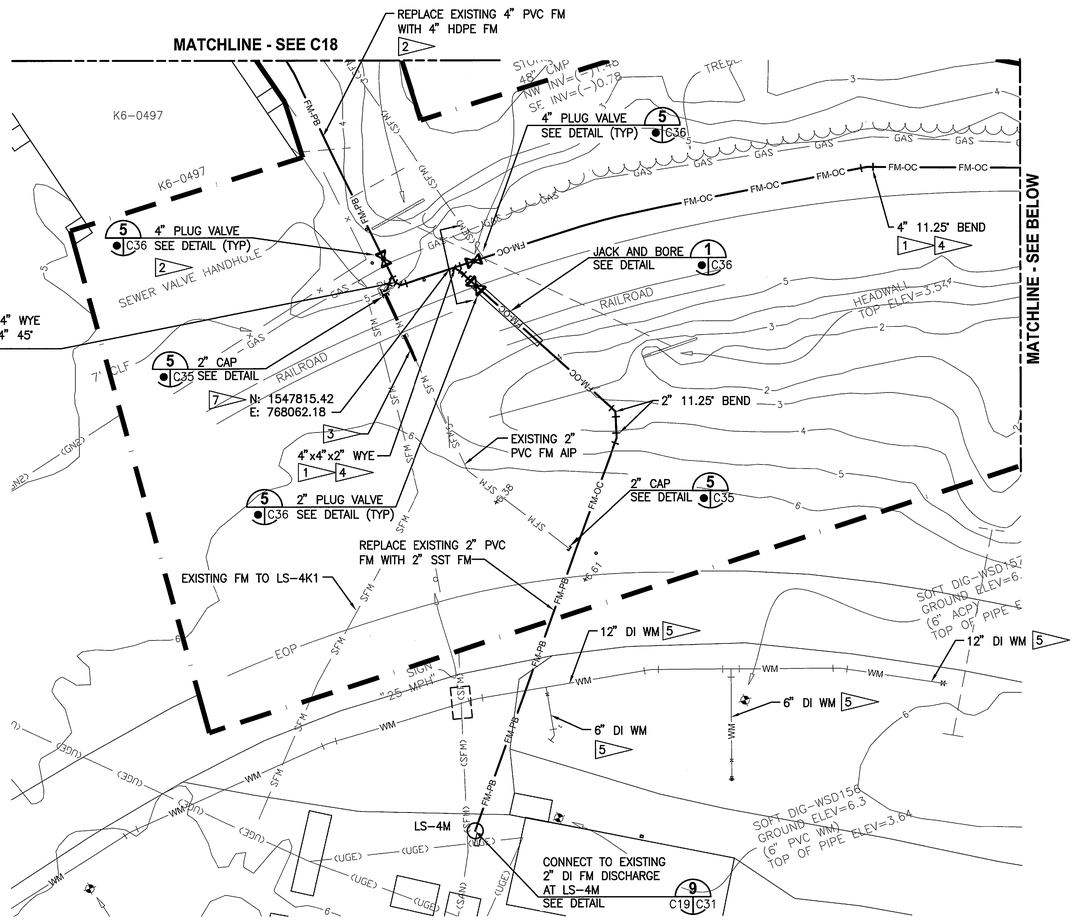
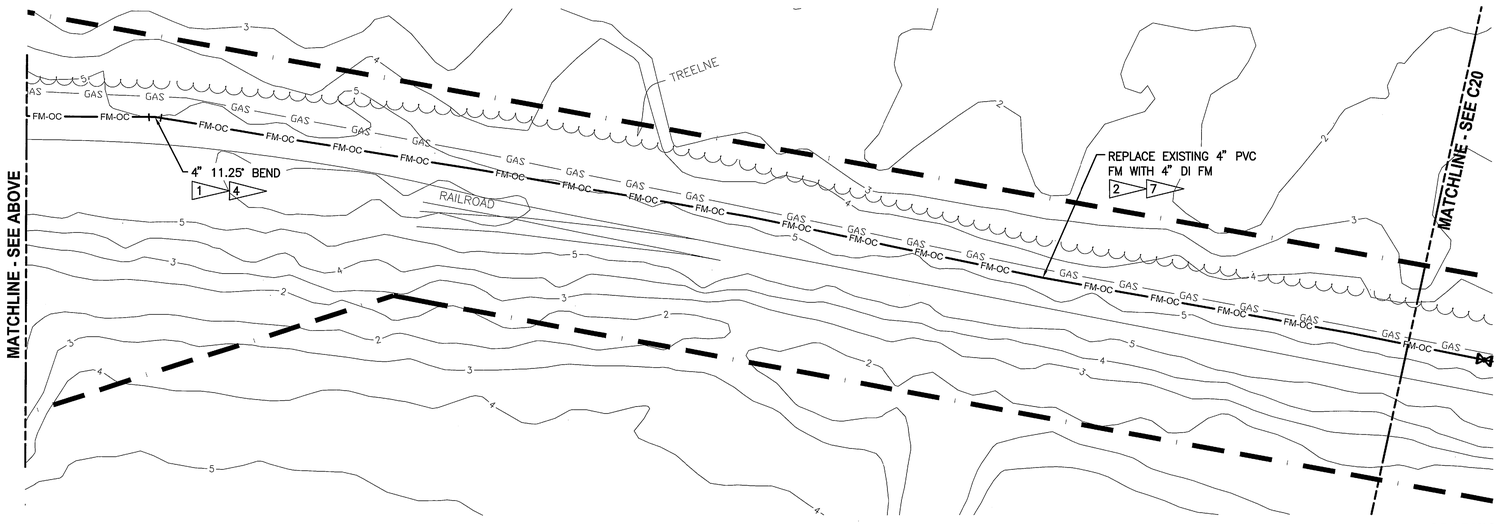
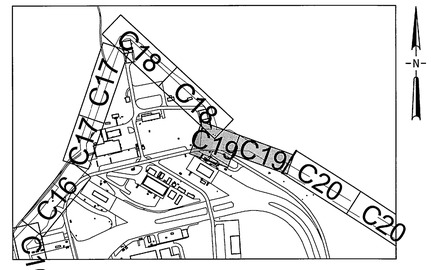



## FORCE MAIN PLAN
1"=20'




## FORCE MAIN PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'




## KEY MAP
NTS

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| SIGNATURES | DATE |
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| SUBMITTED R. BEST | 12/05/11 |
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| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 27

C19

KSC FORM 1-11 (3/76)(C/G 3/94)

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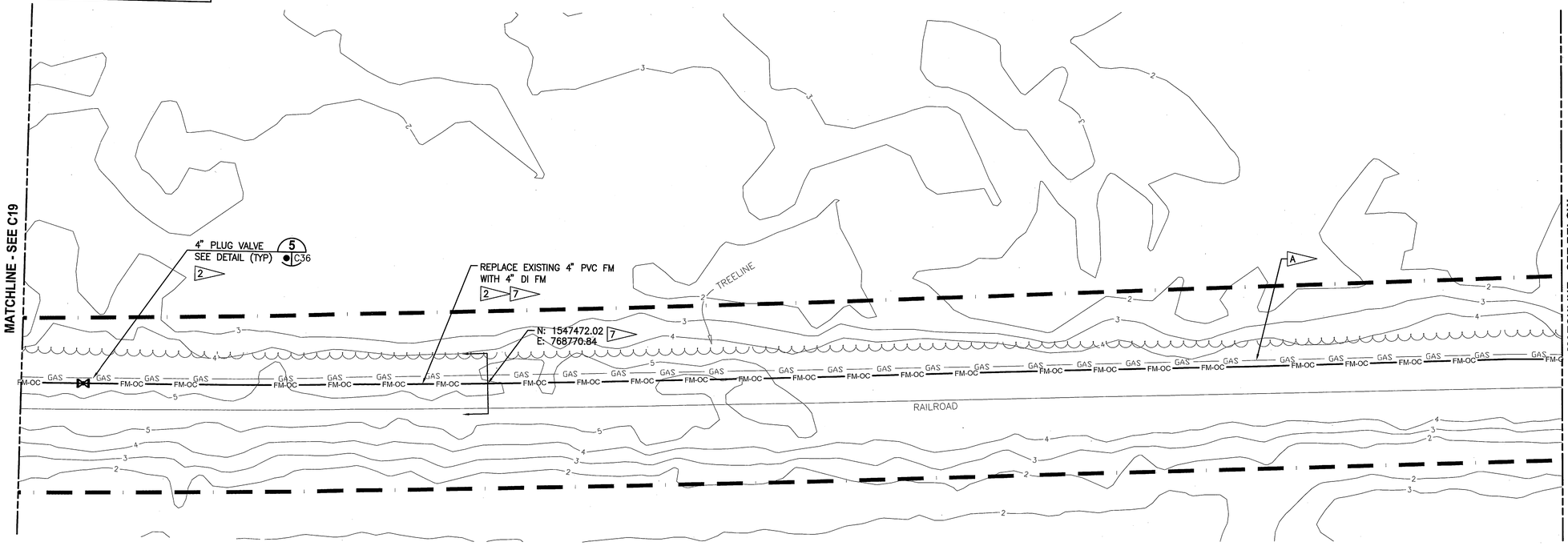
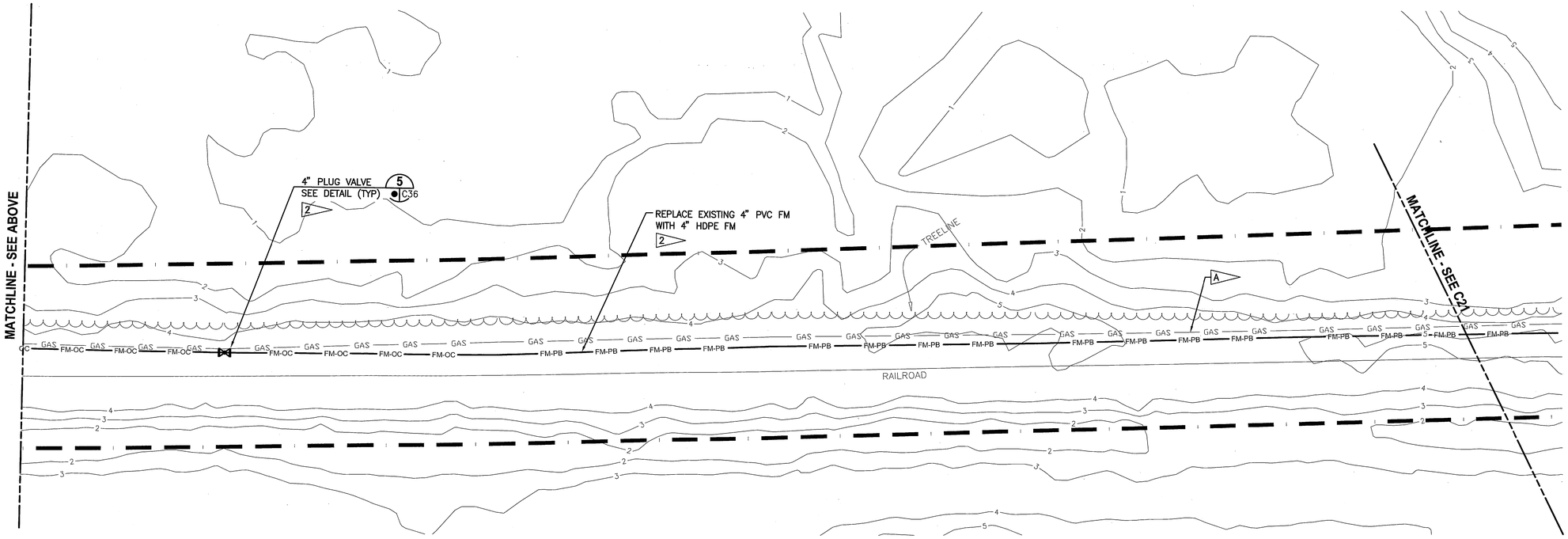
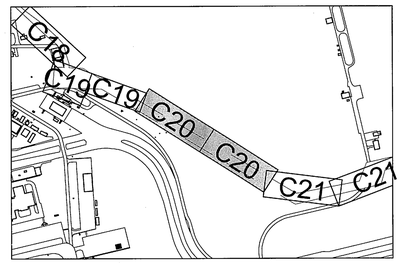



## FORCE MAIN PLAN
1"=20'




## FORCE MAIN PLAN
1"=20'




## KEY MAP
NTS

**NOTES:**

A CONTRACTOR IS RESPONSIBLE FOR TAKING PRECAUTIONS AS NECESSARY TO PROTECT ALL EXISTING MAN-MADE STRUCTURES INCLUDING BUT NOT LIMITED TO THE GAS LINES.

**GRAPHIC SCALE**
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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3910 S WASHINGTON AVE, SUITE 210, TITUSVILLE, FLORIDA 32780 / (321) 269-2950

| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 28

C20

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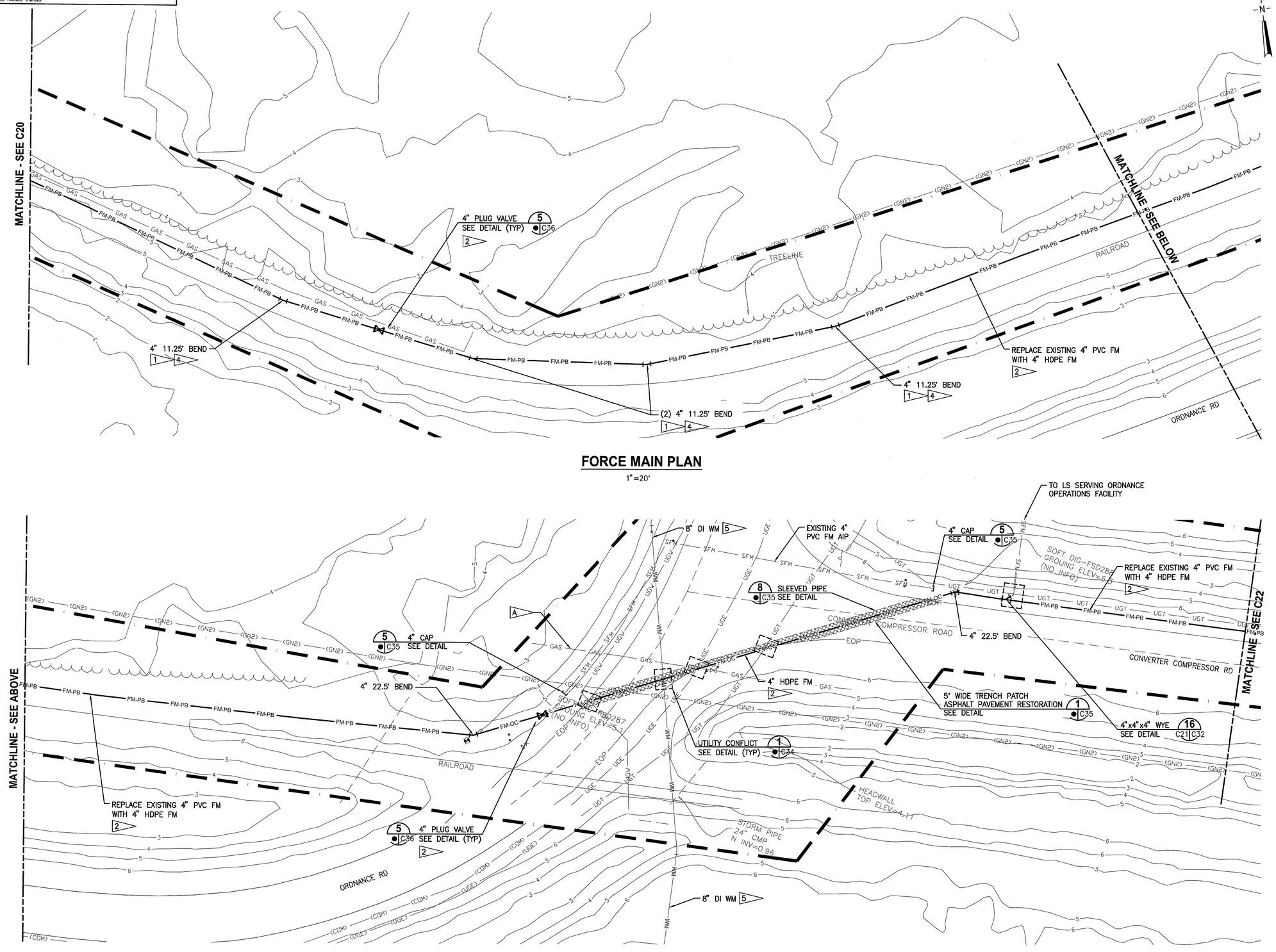
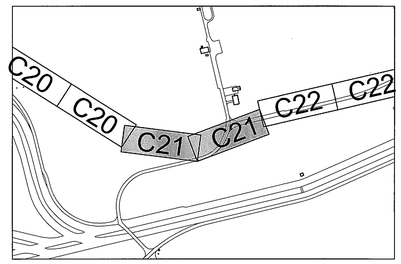



## FORCE MAIN PLAN

1"=20'




## KEY MAP

NTS

**NOTES:**

A CONTRACTOR IS RESPONSIBLE FOR TAKING PRECAUTIONS AS NECESSARY TO PROTECT ALL EXISTING MAN-MADE STRUCTURES INCLUDING BUT NOT LIMITED TO THE GAS LINES.




## ORDNANCE ROAD PLAN

1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | KM |

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 12/05/11 |
| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

C21

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 29 | |

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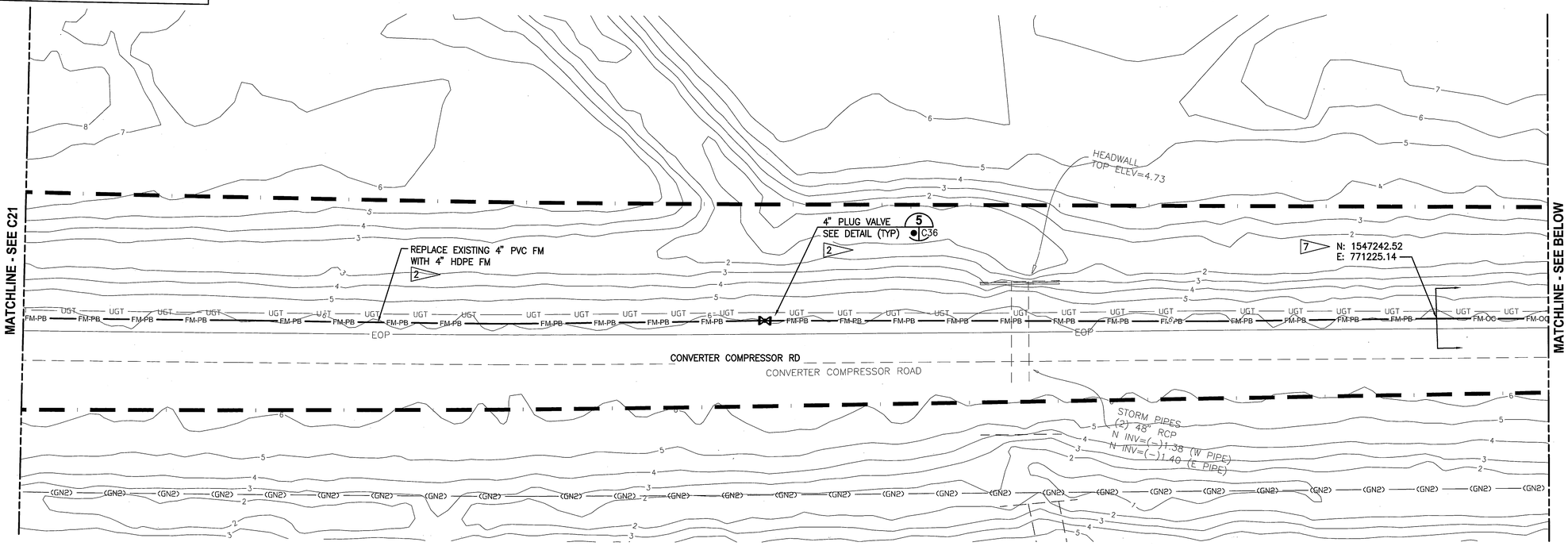
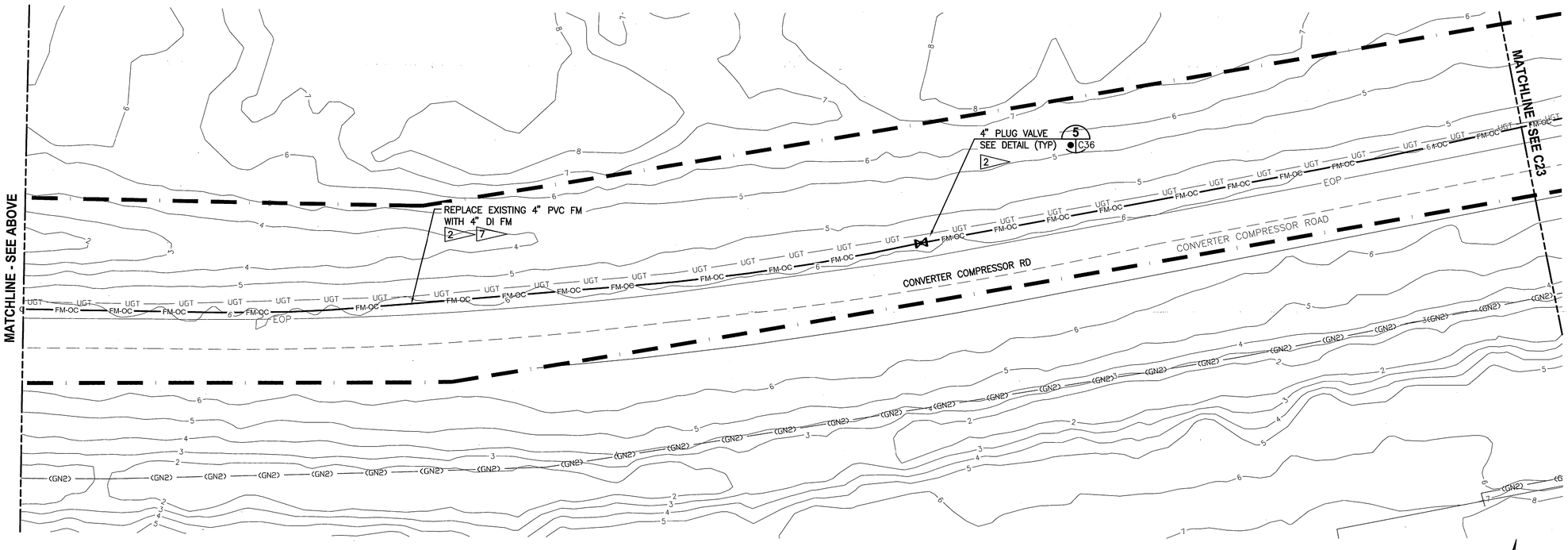


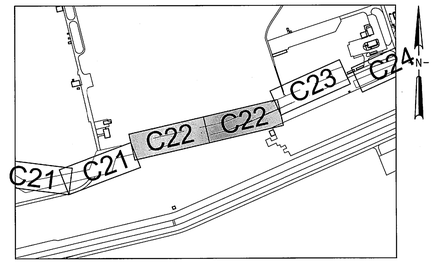

## CONVERTER COMPRESSOR ROAD PLAN

1"=20'




## CONVERTER COMPRESSOR ROAD PLAN

1"=20'




## KEY MAP

NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

N

C22

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | KM |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 30

FORM 1-11 (3/76)(C/G 3/94)

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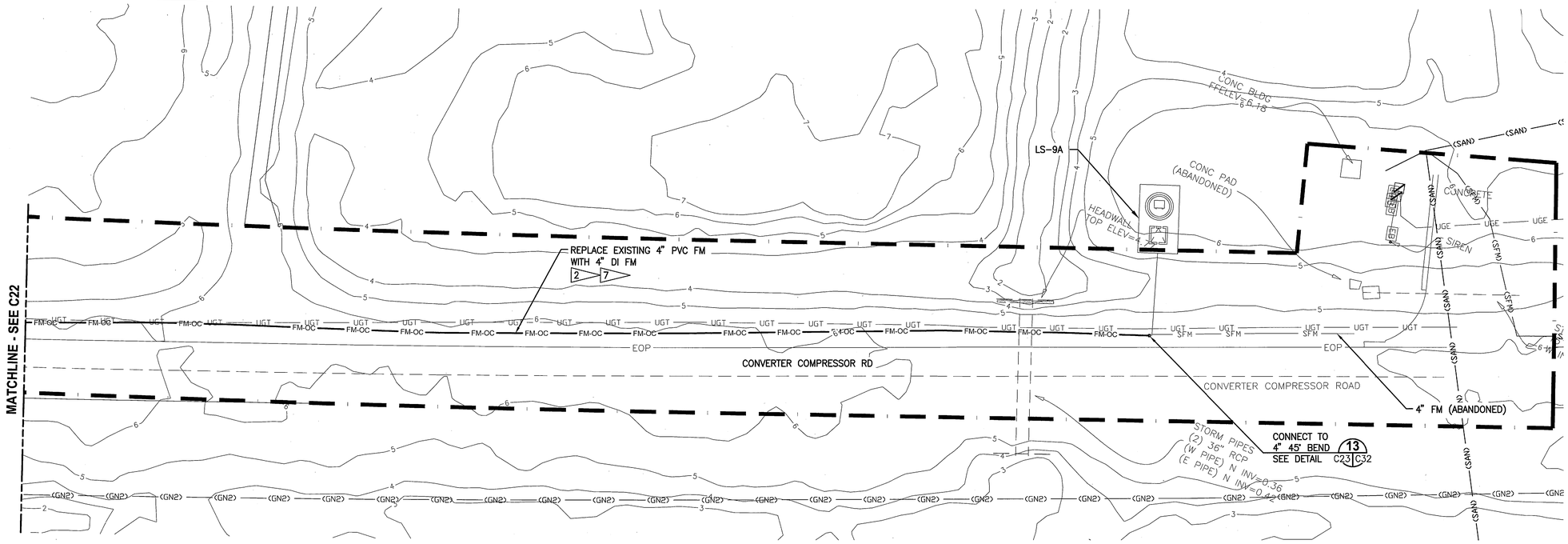
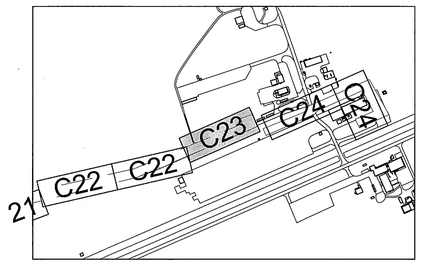



## CONVERTER COMPRESSOR ROAD PLAN

1"=20'




**KEY MAP**
NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

C23

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

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| SIGNATURES | DATE |
|---|---|
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| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 31 | |

FORM 1-11 (3/76)(C/G 3/94)

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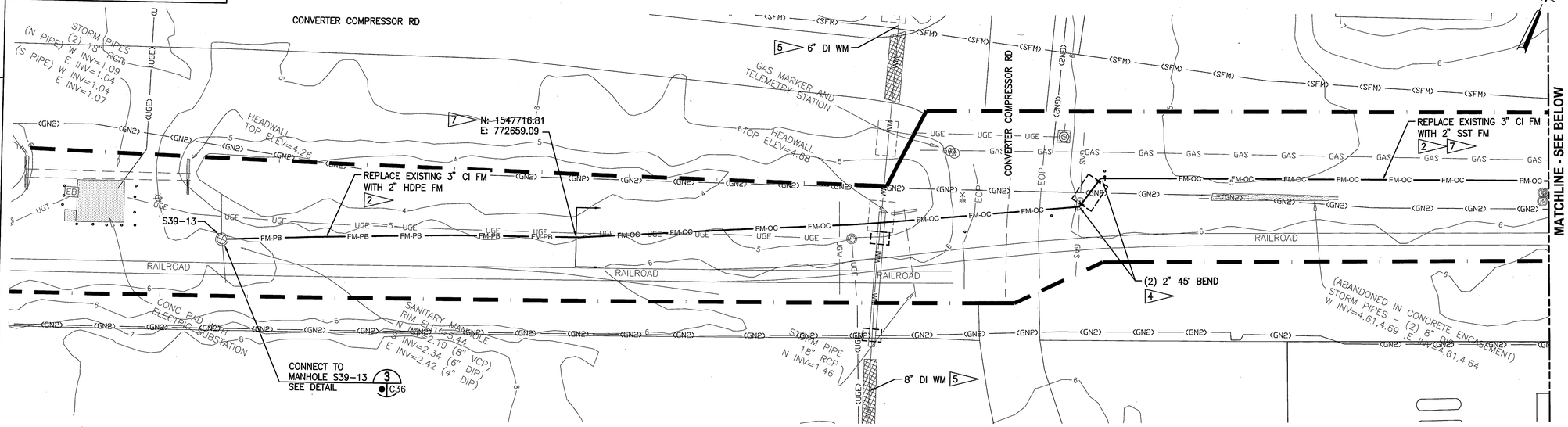
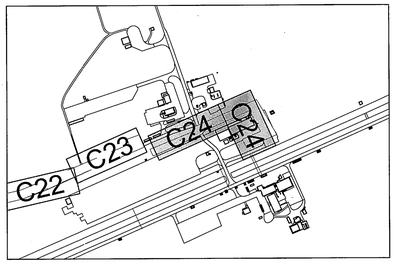


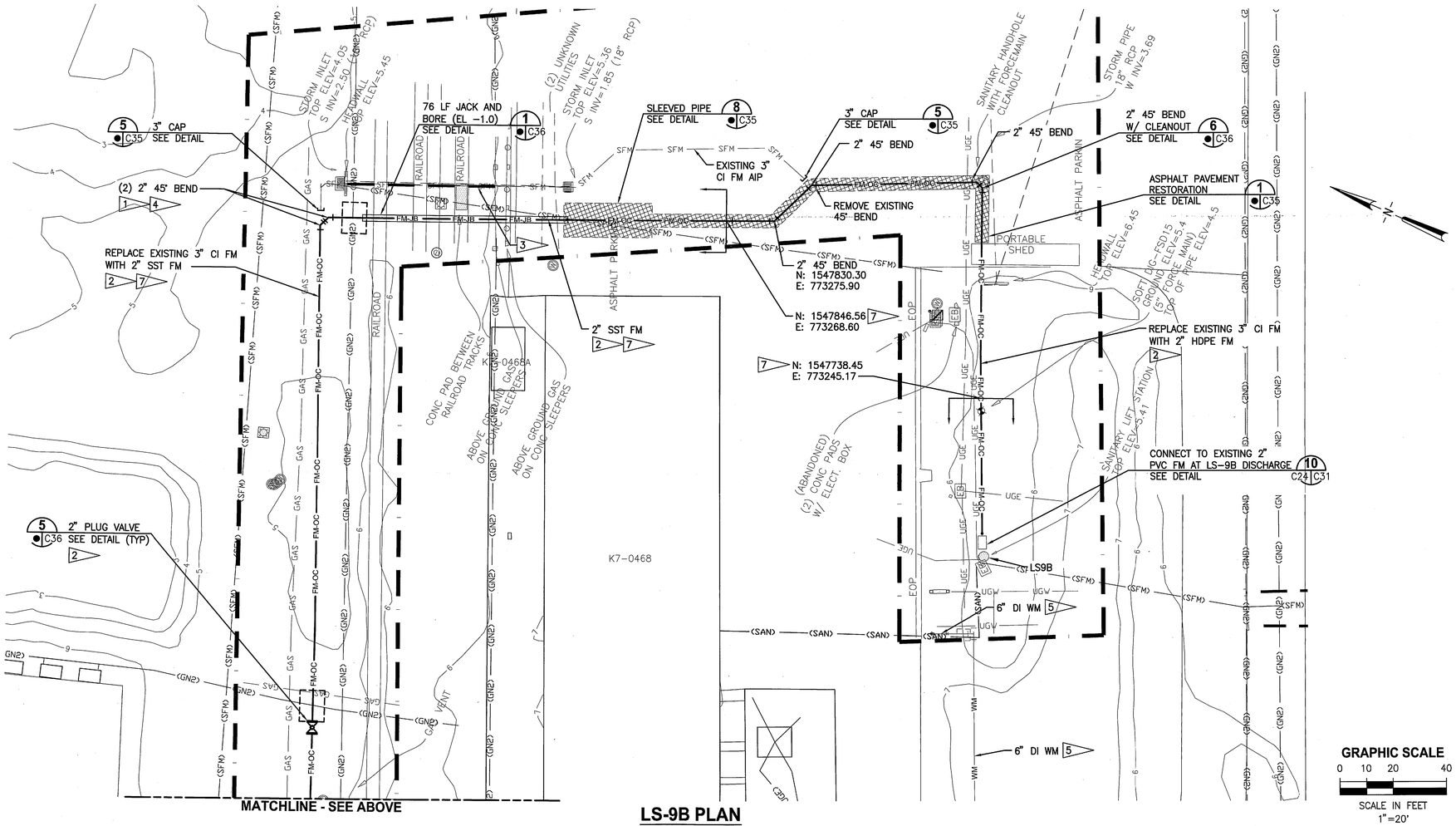

## CONVERTER COMPRESSOR ROAD & FLUID SERVICING ROAD PLAN

1"=20'




## KEY MAP

NTS




## LS-9B PLAN

1"=20'

GRAPHIC SCALE

0 10 20 40

SCALE IN FEET

1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**
**FORCE MAIN LAYOUT PLAN**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 32

C24

FORM 1-11 (3/76)(C/G 3/94)

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MATCHLINE - SEE C26

M6-0785

CONNECT TO EXISTING 3" FM AT LS-1M DISCHARGE SEE DETAIL 14 C25 C32

3/4" PVC SERVICE LINE 5

6" WM DI 5

LS-1M

REPLACE EXISTING 3" PVC WITH 3" HDPE FM

3" 45° BEND 1 4

4TH SREET SE

REPLACE EXISTING 3" PVC WITH 3" HDPE FM

CONNECTION SEE DETAIL 17 C25 C32

3" 90° BEND 1 4

REPLACE EXISTING 3" PVC WITH 3" HDPE FM

A AVENUE SE

5 12" WM DI

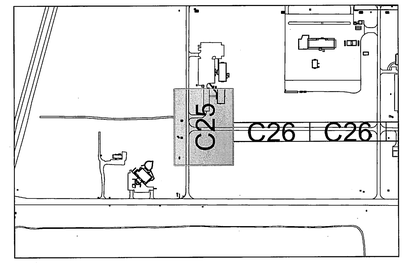
12" DI WM 5

CONNECT TO EXISTING 3" FM AT LS-1L DISCHARGE SEE DETAIL 15 C25 C32

3" 90° BEND 1 4

LS-1L

2" PVC SERVICE LINE 5




**KEY MAP**
NTS

**PLAN**
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | KM |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
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| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 33 | |

C25

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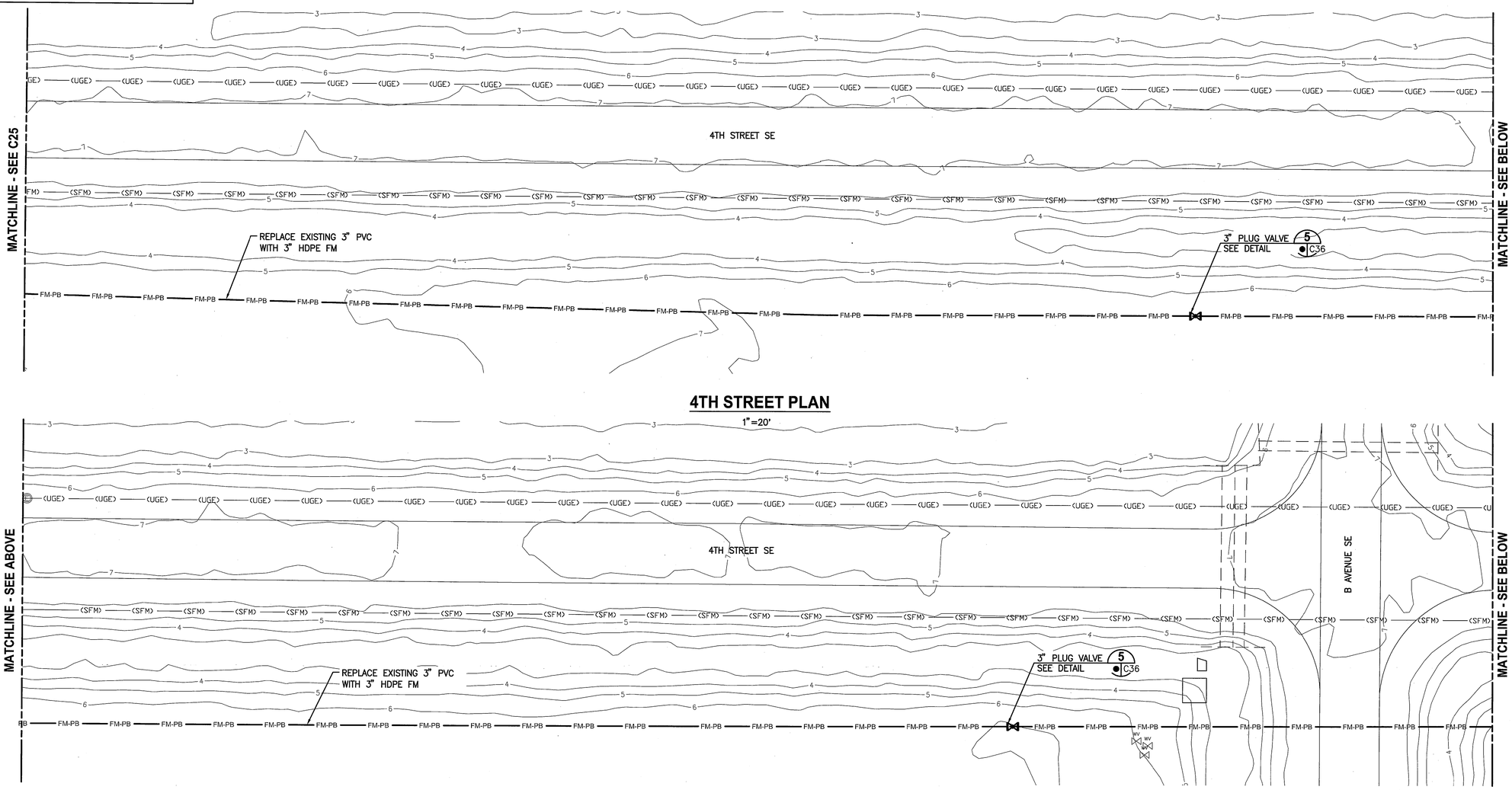
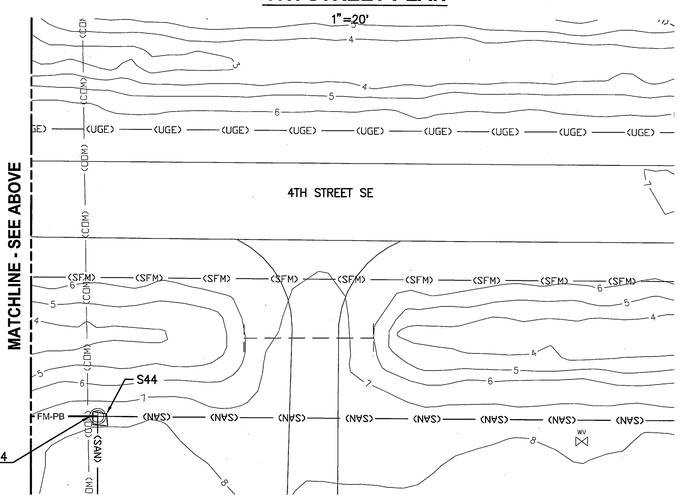
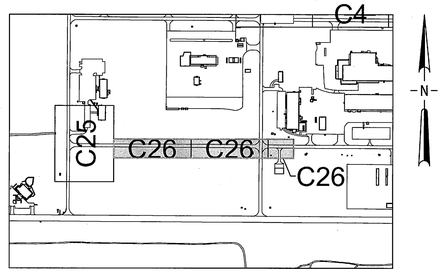



## 4TH STREET PLAN
1"=20'




## 4TH STREET PLAN
1"=20'




**KEY MAP**
NTS

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

N

C26

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL | |
| LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS

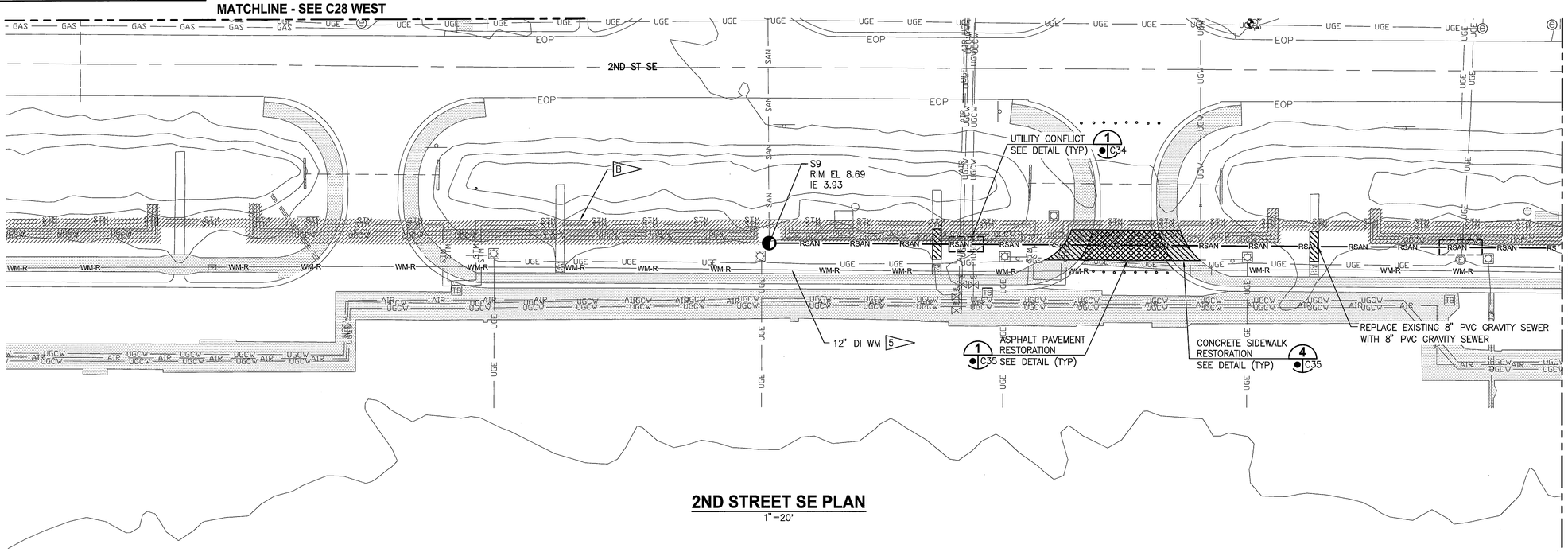
## FORCE MAIN LAYOUT PLAN

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

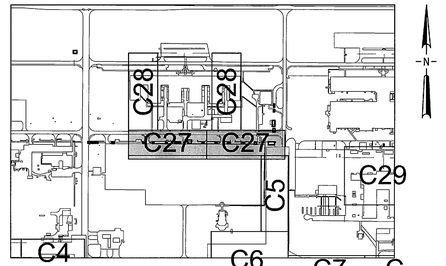
PROJ. NO. 96968.3 SHEET 34

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

MATCHLINE - SEE C28 WEST




## 2ND STREET SE PLAN
1"=20'




## KEY MAP
NTS

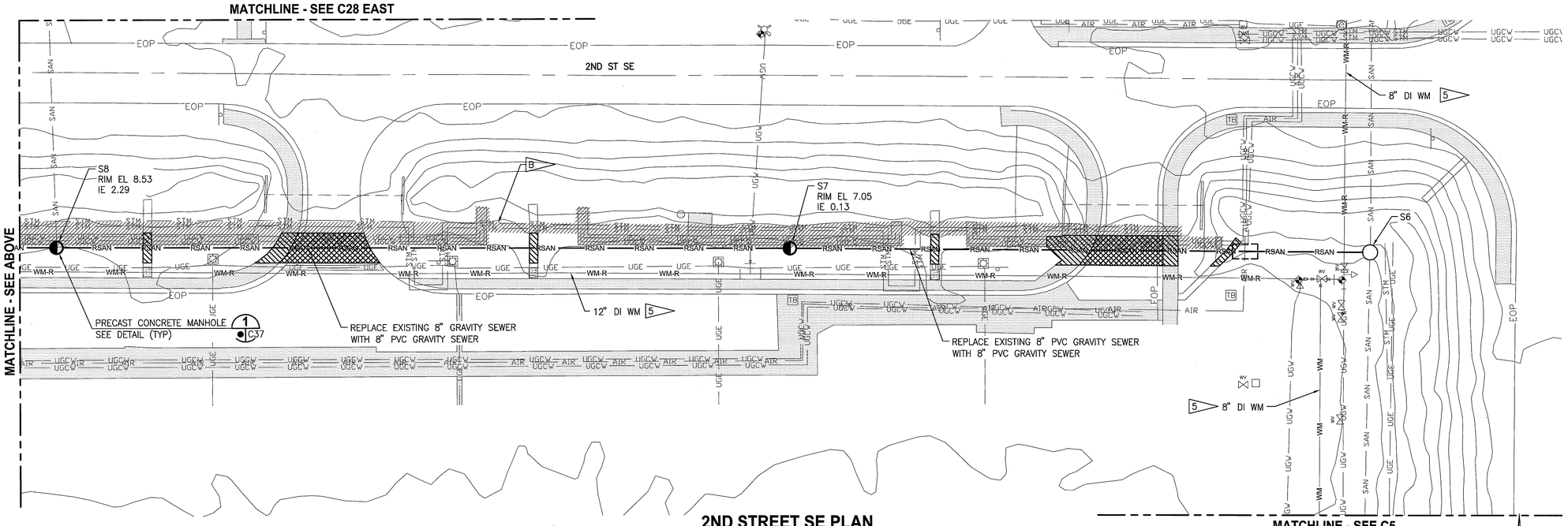
**NOTE**

A. CONTRACTOR TO SURVEY ALL MANHOLES THAT REQUIRE REPLACEMENT TO VERIFY AS-BUILTS MATCH EXISTING CONDITIONS, AND REPORT ANY SIGNIFICANT DEVIATIONS TO THE CO.

B CONTRACTOR TO COORDINATE REMOVAL OF EXISTING GRAVITY MAINS AND MANHOLES AND INSTALLATION OF NEW GRAVITY MAINS AND MANHOLES WITH DEMOLITION AND REMOVAL WORK INVOLVING THE EXISTING HIGH TEMPERATURE HOT WATER LINES UNDER 79K39058 AND WATER MAIN WORK IN 79K38877-VOLUME 1.

B C. EXISTING MANHOLES TO BE REPLACED SHALL MAINTAIN THE SAME ELEVATIONS AS THE EXISTING MANHOLES.

MATCHLINE - SEE C28 EAST




## 2ND STREET SE PLAN
1"=20'

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | ADDED NOTE C | 03/07/12 | |
| A | | GENERAL REVISIONS | 12/05/11 | |

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| SIGNATURES | DATE |
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| CHECKED M. CLARK | 12/05/11 |
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| M. CLARK | |
| K. MILLER | |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## GRAVITY SEWER MANHOLES AND PIPELINES REPAIRS OPTION 1

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |

PROJ. NO. 96968.3 SHEET 35

C27

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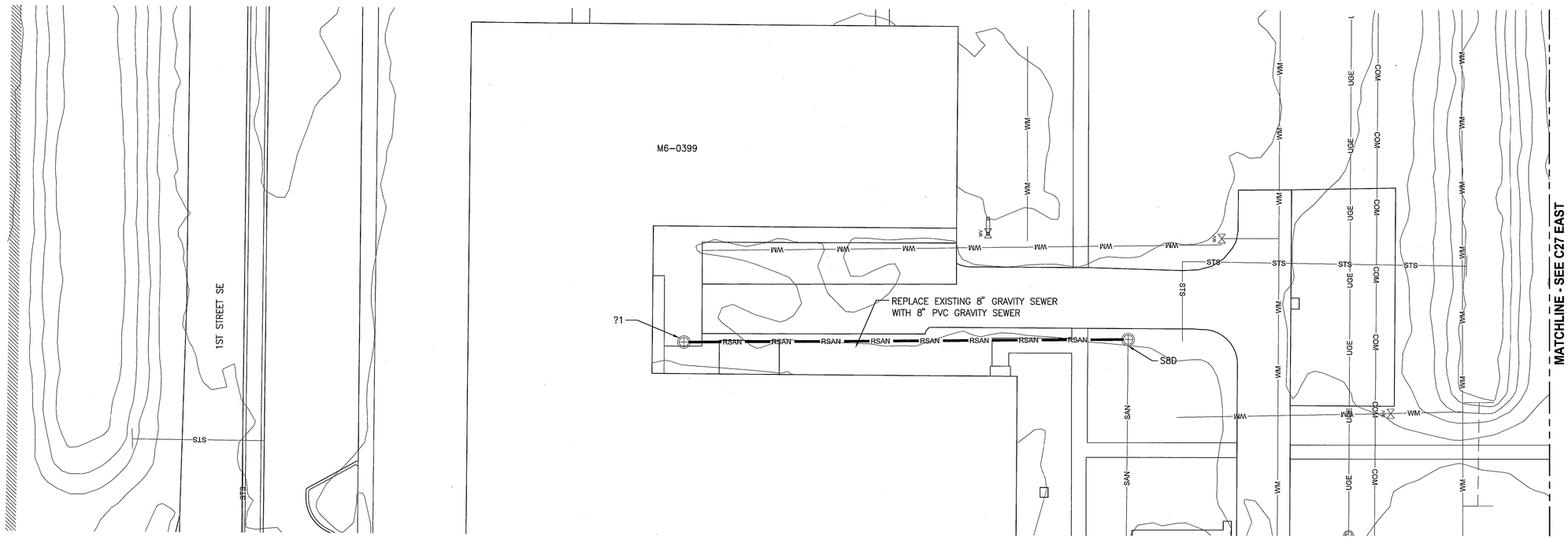
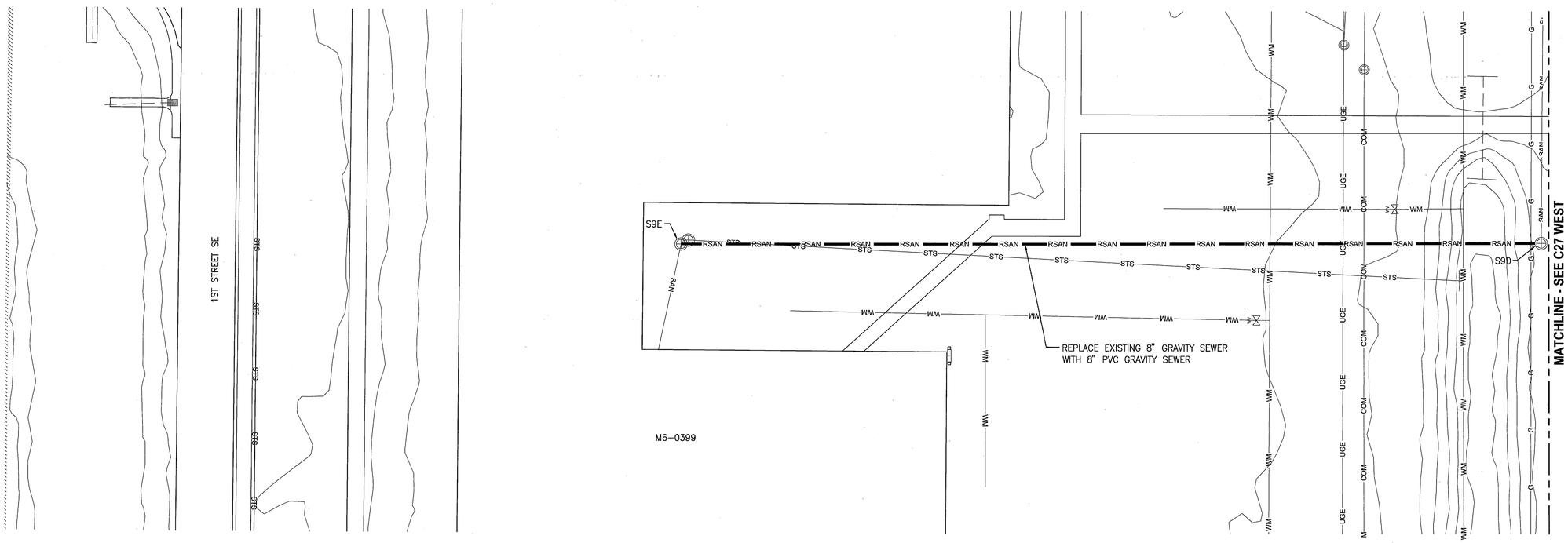



**EAST PLAN**
1"=20'




**KEY MAP**
NTS




**WEST PLAN**
1"=20'

**GRAPHIC SCALE**
0 10 20 40
SCALE IN FEET
1"=20'

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## GRAVITY SEWER REPAIRS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 36 | |

C28

SC FORM 1-11 (3/76)(C/G 3/94)

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M7-0404

M7-0407A

TR5-0532

TR5-0541

TR5-0542

TR5-0549

8" DI WM 5

8" DI WM 5

8" DI WM 5

8" DI WM 5

4" DI WM 5

S11

S11A

S12

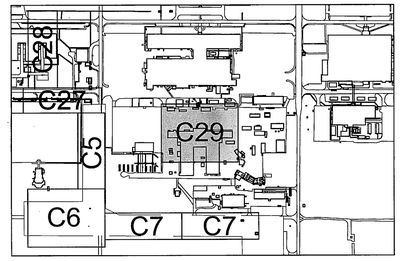
S11B

SLIPLINE EXISTING 8" GRAVITY SEWER. GRAVITY SEWER HAS APPROXIMATELY 2 LATERAL CONNECTIONS

M7-0505

TRM-0017

M7-0505A




**KEY MAP**
NTS

**PLAN**
1"=20'

**GRAPHIC SCALE**
0 10 20 40
SCALE IN FEET
1"=20'

N

C29

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | jcm |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
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| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## GRAVITY SEWER REPAIRS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 37

FORM 1-11 (3/76)(C/G 3/94)

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**CONNECTION DETAIL 1**
1/4"=1'-0" C1 | C30

**CONNECTION DETAIL 2**
1/4"=1'-0" C5 | C30

**CONNECTION DETAIL 3**
1/4"=1'-0" C7 | C30

**CONNECTION DETAIL 4**
1/4"=1'-0" C9 | C30

**CONNECTION DETAIL 5**
1/4"=1'-0" C12 | C30

**CONNECTION DETAIL 6**
1/4"=1'-0" C14 | C30

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | [signature] |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 10/31/11 |
| CHECKED M. CLARK | 10/31/11 |
| SUBMITTED R. BEST | 10/31/11 |
| ST of LICENSURE: FL | |
| LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**
**CONNECTION DETAILS**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 38

C30

FORM 1-11 (3/76)(C/G 3/94)

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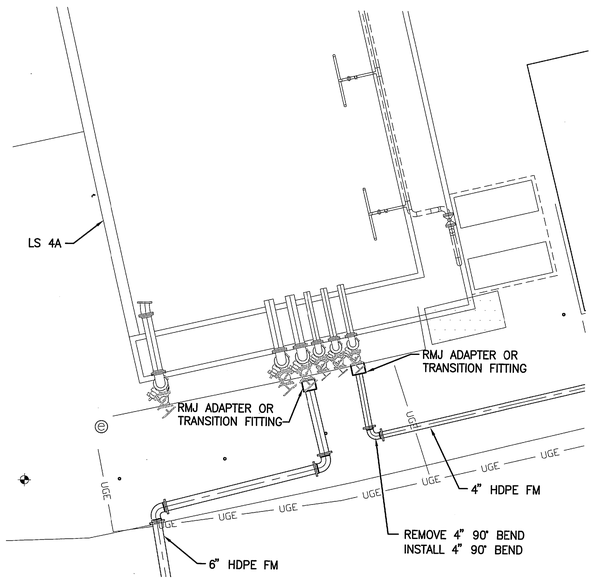
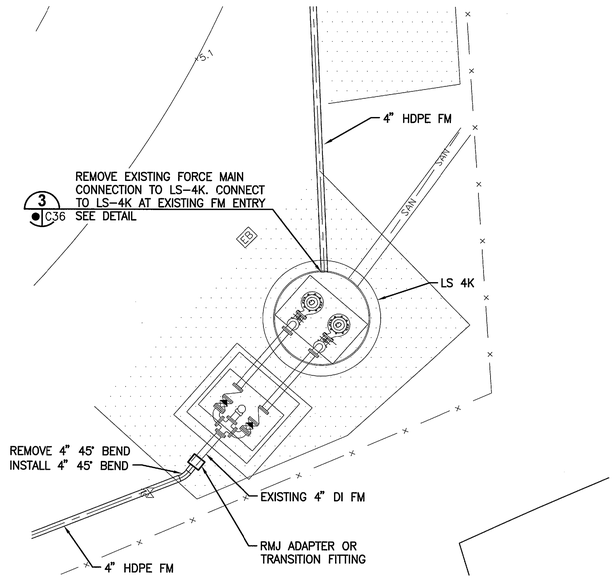
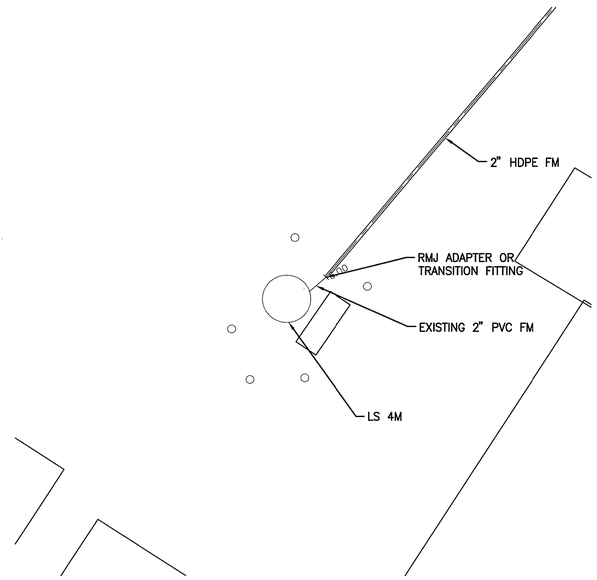


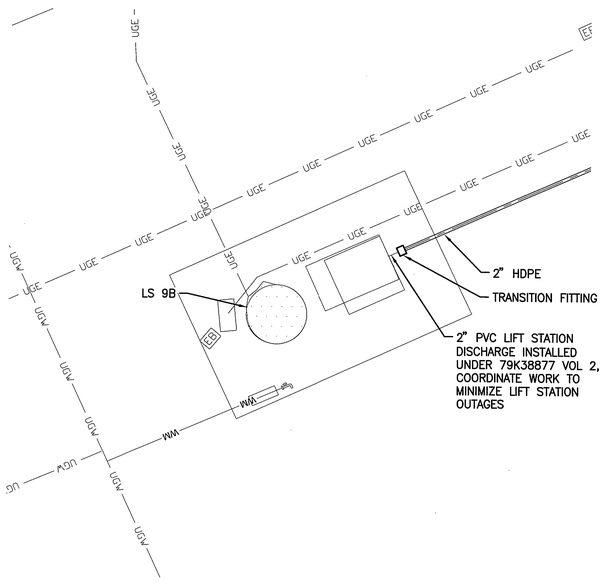

**CONNECTION DETAIL 7**
1/4"=1'-0" C15 | C31



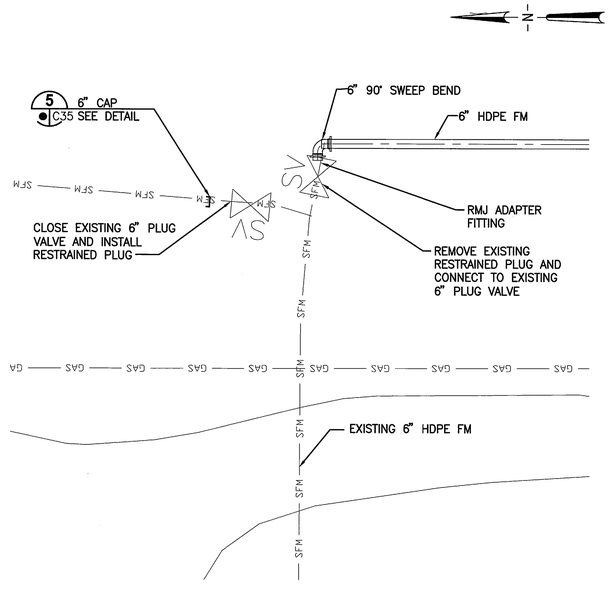

**CONNECTION DETAIL 8**
1/4"=1'-0" C17 | C31



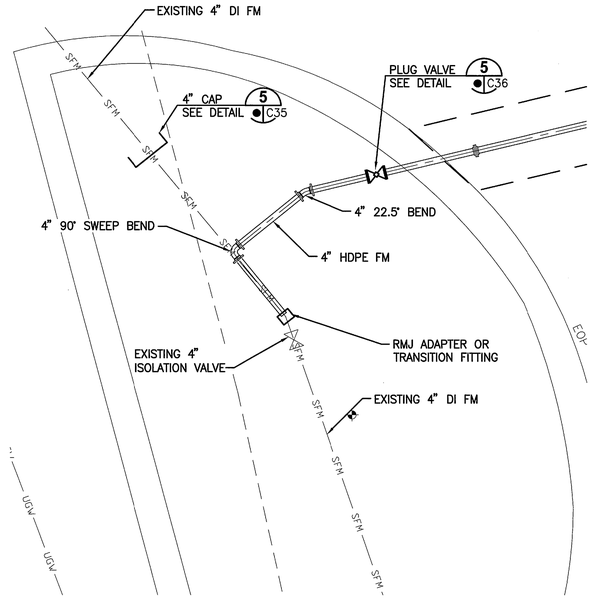

**CONNECTION DETAIL 9**
1/4"=1'-0" C19 | C31




**CONNECTION DETAIL 10**
1/4"=1'-0" C24 | C31




**ENLARGED PLAN - DETAIL 11**
1/4"=1'-0" C2 | C31




**CONNECTION DETAIL 12**
1/4"=1'-0" C13 | C31

C31

N

GRAPHIC SCALE
0 1 2 4 8
SCALE IN FEET
1/4"=1'-0"

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 12/05/11 | |

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 12/05/11 |
| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | 12/05/11 |
| K. MILLER | 12/5/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## CONNECTION DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 39 | |

FSC FORM 1-11 (3/76)(C/G 3/94)

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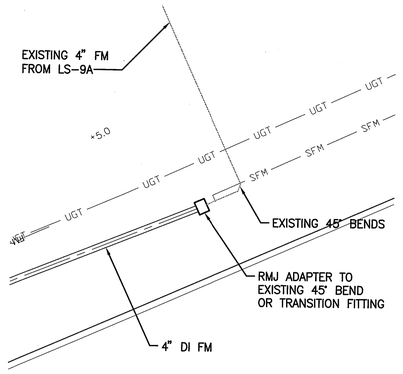
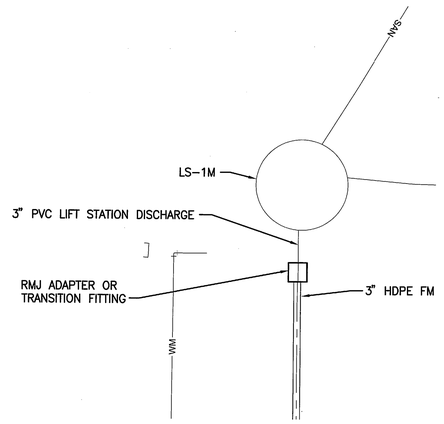
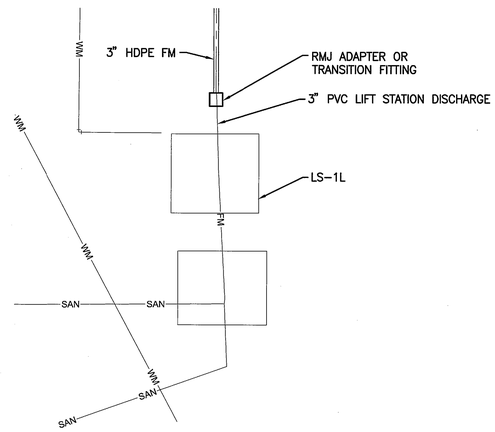


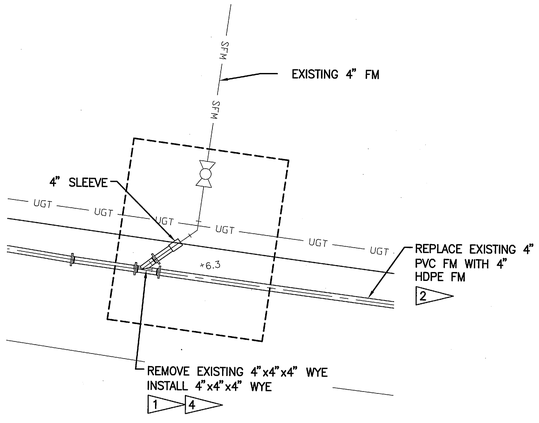

**CONNECTION DETAIL 13**
1/4"=1'-0" C23 C32



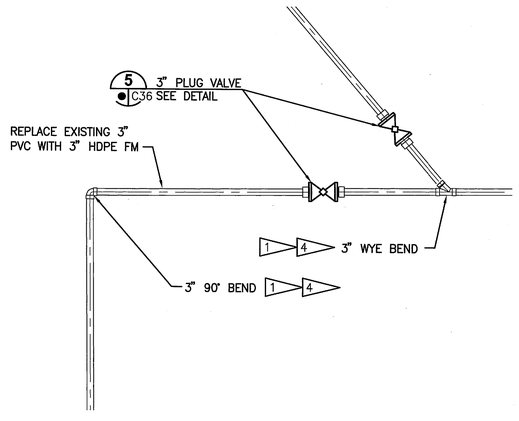

**CONNECTION DETAIL 14**
1/4"=1'-0" C25 C32



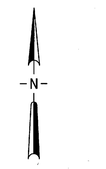

**CONNECTION DETAIL 15**
1/4"=1'-0" C25 C32




**CONNECTION DETAIL 16**
1/4"=1'-0" C21 C32




**CONNECTION DETAIL 17**
1/4"=1'-0" C25 C32




**GRAPHIC SCALE**
0 1 2 4 8
SCALE IN FEET
1/4"=1'-0"

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| LICENSE NO: 69875 | |
| APPROVED M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## CONNECTION DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |

PROJ. NO. 96968.3 SHEET 40

C32

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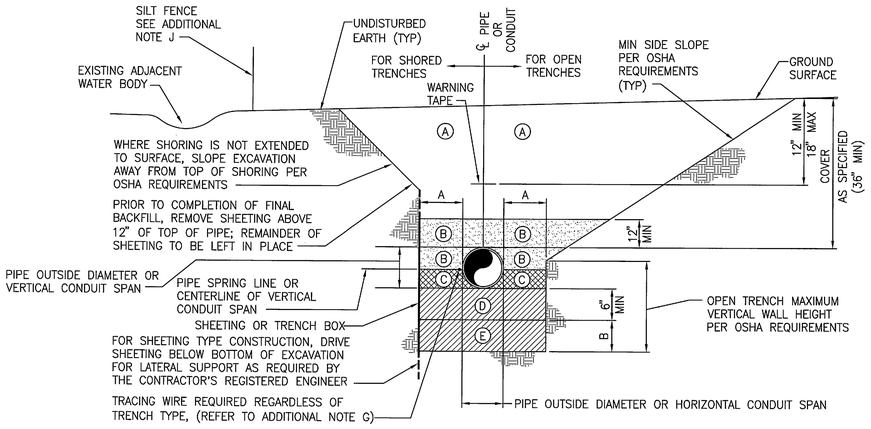



| NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES) | MINIMUM SIDEWALL CLEARANCE | ADDITIONAL EXCAVATION DEPTH (1) |
|---|---|---|
| | A (INCHES) | B (INCHES) |
| LESS THAN 24 | 12 | 12 |
| 24 AND GREATER | 18 | 18 |

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

| ZONE NO. | ZONE NAME | MATERIAL | COMPACTION |
|---|---|---|---|
| (A) | FINAL BACKFILL | AS SPECIFIED | AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 |
| (B) | INITIAL BACKFILL | | |
| (C) | HAUNCHING | | |
| (D) | BEDDING | | |
| (E) | FOUNDATION | | |

TRENCH ZONE NOTES:

(A) FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE H.

(B) INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE H.

(C) HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

(D) BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE H.

NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

(E) FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE H.

ADDITIONAL NOTES:

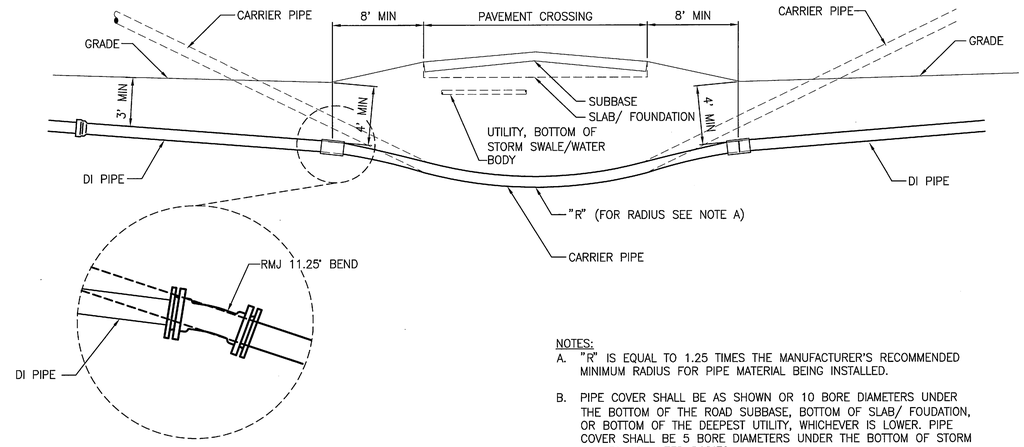
F. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLAB, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS.

G. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE UF SPLICE, OR APPROVED EQUAL, SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.

H. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

J. CONSTRUCT STORMWATER POLLUTION PREVENTION ITEMS ADJACENT TO ALL SOIL DISTURBANCES ACCORDING TO DETAILS ON EN3. PLACE ON DOWN SLOPE TO INTERCEPT SEDIMENT AND PROTECT NEARBY WATER BODIES AND UNDISTURBED AREAS. MAINTAIN STORMWATER POLLUTION PREVENTION ITEMS IN GOOD WORKING ORDER UNTIL ADEQUATE COVER MATERIALS ARE ESTABLISHED. IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT. BUILT UP SEDIMENT WILL BE REMOVED FROM STAKED SILT FENCE AND STAKED TURBIDITY BARRIERS WHEN IT HAS REACHED ONE-HALF THE HEIGHT OF THE SILT FENCE OR BARRIER.

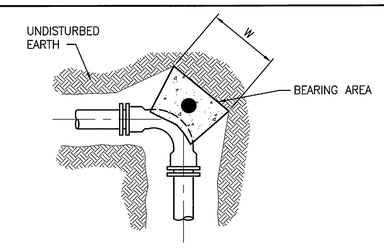
## TYPICAL UTILITY TRENCH DETAIL 1
NTS — C33



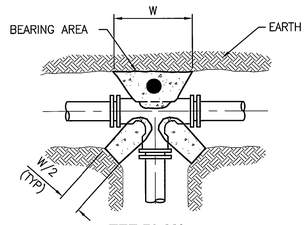

CONNECTION DETAIL (TYP BOTH SIDES)

NOTES:
A. "R" IS EQUAL TO 1.25 TIMES THE MANUFACTURER'S RECOMMENDED MINIMUM RADIUS FOR PIPE MATERIAL BEING INSTALLED.
B. PIPE COVER SHALL BE AS SHOWN OR 10 BORE DIAMETERS UNDER THE BOTTOM OF THE ROAD SUBBASE, BOTTOM OF SLAB/ FOUDATION, OR BOTTOM OF THE DEEPEST UTILITY, WHICHEVER IS LOWER. PIPE COVER SHALL BE 5 BORE DIAMETERS UNDER THE BOTTOM OF STORM SWALES OR WATER BODIES.

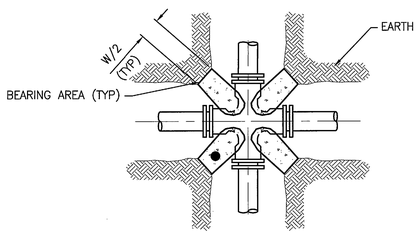
## TYPICAL HORIZONTAL DIRECTIONAL DRILL DETAIL 2
NTS — C14 | C33



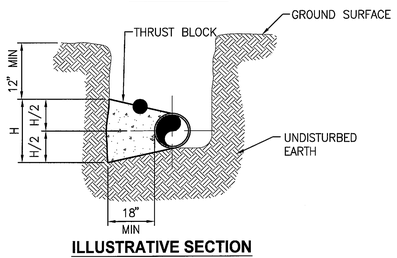

BENDS PLAN



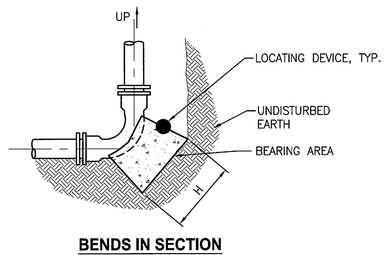

TEE PLAN




CROSS PLAN




ILLUSTRATIVE SECTION




BENDS IN SECTION

| REACTION BLOCK BEARING AREA DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| FITTING | 11 1/4° BEND | 22 1/2° BEND | 45° BEND | 90° BEND | TEE/CROSS/ PLUGS/CAPS |
| SIZE (in) | H x W (in) | H x W (in) | H x W (in) | H x W (in) | H x W (in) |
| 4 | 11x11 | 15x15 | 20x20 | 28x28 | 23x23 |
| 6 | 15x15 | 21x21 | 29x29 | 40x40 | 33x33 |
| 8 | 20x20 | 27x27 | 38x38 | 52x52 | 44x44 |
| 10 | 24x24 | 33x33 | 47x47 | 63x63 | 53x53 |
| 12 | 28x28 | 40x40 | 55x55 | 75x75 | 63x63 |
| 14 | 33x33 | 46x46 | 64x64 | 87x87 | 73x73 |
| 16 | 37x37 | 52x52 | 73x73 | 99x99 | 83x83 |
| 18 | 42x42 | 58x58 | 82x82 | 111x111 | 93x93 |
| 24 | 55x55 | 77x77 | 106x108 | 146x146 | 123x123 |

B

REACTION BLOCK NOTES

A. BASED ON 150 PSI PRESSURE & 1500 PSF SOIL BEARING VALUE, 2.0 SAFETY FACTOR, WATER TABLE BELOW THE THRUST BLOCK, VERTICAL BLOCK FACE, AND A MINIMUM THICKNESS OF 18 INCHES. B

B. BEARING AREAS FOR PLUGS SHALL BE THE SAME AS FOR TEES.

C. FORM REACTION BLOCKS TO KEEP CONCRETE CLEAR OF JOINTS AND BOLTS.

D. REQUIRED REACTION BLOCK BEARING AREA SHALL BE PLACED AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE ALL LOOSE MATERIAL AND EXTEND REACTION BLOCK TO UNDISTURBED MATERIAL.

E. PLACE PRESSURE TREATED WOOD BOARDS IN FRONT OF PLUG, AT TEE, CROSS OR END OF PIPE BEFORE POURING CONCRETE REACTION BLOCK.

F. BACKFILL SHALL CONSIST ENTIRELY OF CLEAN SAND AND ROCK FRAGMENTS. ANY MUCK ENCOUNTERED SHALL BE REPLACED WITH BACKFILL COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY, ASTM D1557.

G. CONTRACTOR TO OBTAIN LOCATING DEVICES AND TO EMBED THE DEVICE INTO THE TOP SURFACE ON THE THRUST BLOCK SUCH THAT HALF THE DEVICE IS EXPOSED AND THE LOCATION IS AT THE CENTROID OF THE THRUST BLOCK TOP SURFACE AREA. THE LOCATING DEVICES SHALL BE OMNI MARKER MODEL 161 WATER MARKER OR APPROVED EQUAL.

## TYPICAL REACTION BLOCK (THRUST BLOCK) DETAILS 3
NTS — C33

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | REVISED DETAIL 3 | 03/07/12 | MC |
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 12/05/11 |
| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | |
| K. MILLER | |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## CIVIL DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
| PROJ. NO. 96968.3 | | SHEET 41 | |

C33

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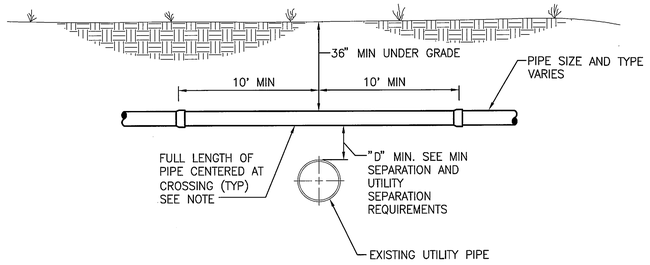
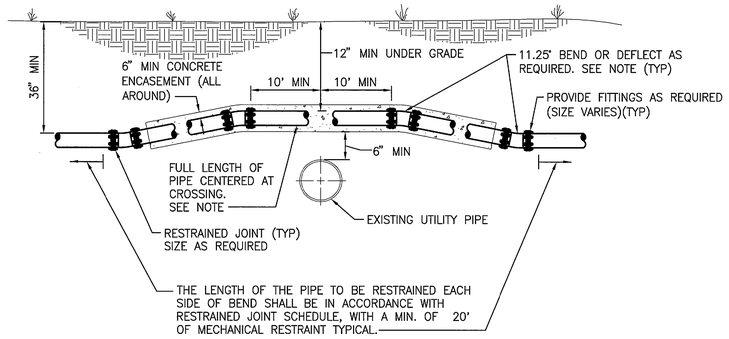
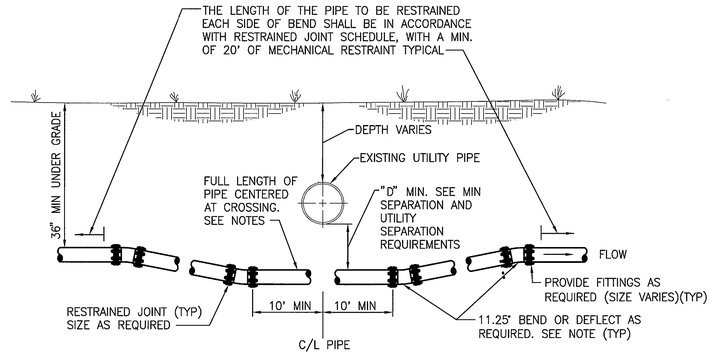



**CROSSING OVER UTILITIES**




NOTE: ENCASEMENT IS REQUIRED IF DEPTH FROM GRADE TO TOP OF PIPE IS LESS THAN 24 INCHES.

**CROSSING OVER UTILITIES (ENCASED)**




**CROSSING UNDER UTILITIES**

## UTILITY SEPARATION REQUIREMENTS

A. IT IS REQUIRED THAT "WATER MAINS" BE INSTALLED, CLEANED, DISINFECTED AND HAVE A SATISFACTORY BACTERIOLOGICAL SURVEY PERFORMED IN ACCORDANCE WITH THE LATEST APPLICABLE AWWA STANDARDS AND CHAPTER 62-555, F.A.C. STANDARDS. FOR THE PURPOSE OF THIS SECTION, THE PHRASE "WATER MAINS" SHALL MEAN MAINS, INCLUDING TREATMENT PLANT PROCESS PIPING, CONVEYING EITHER RAW, PARTIALLY TREATED, OR FINISHED DRINKING WATER; FIRE HYDRANT LEADS; AND SERVICE LINES THAT HAVE AN INSIDE DIAMETER OF THREE (3) INCHES OR GREATER. IN ADDITION, THE PHRASE "REGULATED PUBLIC ACCESS RECLAIMED WATER" REFERS TO THE WATER REGULATED UNDER PART III OF CHAPTER 62.210, F.A.C.

B. NEW, RELOCATED OR EXISTING UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE (3) FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM SEWER, STORMWATER FORCE MAIN, OR PIPELINE CONVEYING REGULATED PUBLIC ACCESS RECLAIMED WATER.

C. NEW OR RELOCATED, UNDERGROUND SEWER/WATER MAINS SHALL BE LOCATED TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX (6) FEET, AND PREFERABLY TEN (10) FEET, BETWEEN THE OUTSIDE OF THE SEWER/WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED WATER/GRAVITY OR PRESSURE-TYPE SANITARY SEWER, NON-REGULATED RECLAIMED WATER, OR WASTEWATER FORCE MAIN. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY-TYPE SANITARY SEWERS MAY BE REDUCED TO THREE (3) FEET WHERE THE BOTTOM OF THE WATER MAIN IS LOCATED AT LEAST SIX (6) INCHES ABOVE THE TOP OF THE SEWER (SPECIAL CASE).

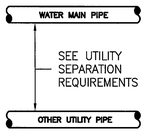
D. NEW, RELOCATED OR EXISTING UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY OR VACUUM-TYPE SANITARY SEWER, OR STORM SEWER SHALL BE LOCATED SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX (6) INCHES, AND PREFERABLE TWELVE (12) INCHES, ABOVE OR AT LEAST TWELVE (12) INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.

E. NEW, RELOCATED OR EXISTING UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED PRESSURE-TYPE SANITARY SEWER, WASTEWATER OR STORMWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER SHALL BE LOCATED SO THE OUTSIDE OF THE WATER MAIN IS A LEAST TWELVE (12) INCHES ABOVE OR BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.

F. AT THE UTILITY CROSSINGS DESCRIBED IN NOTES D AND E ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL WATER MAIN JOINTS ARE AT LEAST THREE (3) FEET FROM ALL JOINTS IN VACUUM-TYPE SANITARY SEWERS, STORM SEWERS, STORMWATER FORCE MAINS, OR PIPELINES CONVEYING REGULATED PUBLIC ACCESS RECLAIMED WATER, AND AT LEAST SIX (6) FEET FROM ALL JOINTS IN GRAVITY OR PRESSURE-TYPE SANITARY SEWERS, NON-REGULATED RECLAIMED WATER, OR WASTEWATER FORCE MAINS.

G. NEW, RELOCATED OR EXISTING FIRE HYDRANTS SHALL BE LOCATED SO THAT THE HYDRANTS ARE AT LEAST THREE (3) FEET FROM ANY EXISTING OR PROPOSED STORM SEWER, STORMWATER FORCE MAIN, OR PIPELINE CONVEYING REGULATED PUBLIC ACCESS RECLAIMED WATER; AT LEAST THREE (3) FEET, AND PREFERABLY TEN (10) FEET, FROM ANY EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER; AT LEAST SIX (6) FEET, AND PREFERABLY TEN (10) FEET, FROM ANY EXISTING OR PROPOSED GRAVITY OR PRESSURE-TYPE SANITARY SEWER OR WASTEWATER FORCE MAIN.

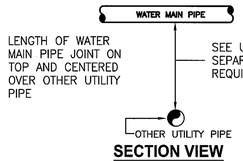
H. IF THE CONTRACTOR CAN NOT MEET THE MINIMUM SEPARATION REQUIREMENTS HE/SHE MUST NOTIFY THE CONTRACTING OFFICER. THE CONTRACTING OFFICER IS REQUIRED TO DISCUSS MITIGATION WITH FDEP AND OBTAIN FDEP APPROVAL PRIOR TO INSTALLING ANY UTILITIES NOT IN COMPLIANCE WITH FDEP MINIMUM SEPARATION REQUIREMENTS.




**PLAN VIEW**

| OTHER PIPING TYPE | MINIMUM HORIZONTAL SEPARATION (FEET) SEE NOTE C |
|---|---|
| 1. GRAVITY SANITARY SEWER | 6 |
| 2. GRAVITY SANITARY SEWER (SPECIAL CASE, NOTE #3) | 3 |
| 3. SEWAGE FORCE MAIN | 6 |
| 4. GRAVITY STORM SEWER | 3 |
| 5. RECLAIMED WATER (PUBLIC ACCESS) | 3 |
| 6. ELECTRIC | 3 |
| 7. OTHER | 6 |

**MINIMUM HORIZONTAL SEPARATION REQUIREMENTS**




**SECTION VIEW**

| OTHER PIPING TYPE | "D" – MINIMUM VERTICAL SEPARATION (INCHES) SEE NOTE D |
|---|---|
| 1. GRAVITY SANITARY SEWER | 6 |
| 2. SEWAGE FORCE MAIN | 12 |
| 3. GRAVITY STORM SEWER | 6 |
| 4. RECLAIMED WATER | 12 |
| 5. ELECTRIC | 6 |
| 6. OTHER | 12 |

NOTE:

J. IF THE WATER MAIN IS BELOW THE SEWER PIPE, THEN A MINIMUM OF 12" VERTICAL SEPARATION IS REQUIRED.

K. THE CONTRACTOR MAY CHOOSE TO DEFLECT THE PROPOSED PIPE UNDER OR OVER THE EXISTING UTILITY PIPE IN LIEU OF USING FITTINGS AS LONG AS THE MINIMUM DISTANCE "D" IS MAINTAINED AND THE AMOUNT OF PIPE DEFLECTION MEETS THE REQUIREMENTS OF THE SPECIFICATIONS.

**MINIMUM VERTICAL SEPARATION REQUIREMENTS**

## TYPICAL UTILITY CONFLICT DETAIL 1

NTS C34

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | REVISED DETAIL 1 | 03/07/12 | |
| A | | GENERAL REVISIONS | 10/31/11 | |

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| SIGNATURES | DATE |
|---|---|
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| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | |
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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**
**CIVIL DETAILS**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |

PROJ. NO. 96968.3 SHEET 42

C34

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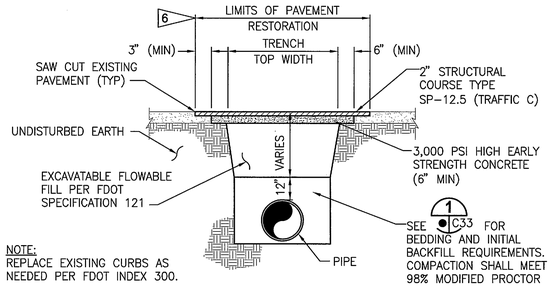
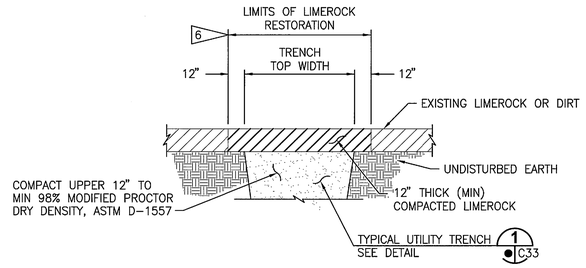
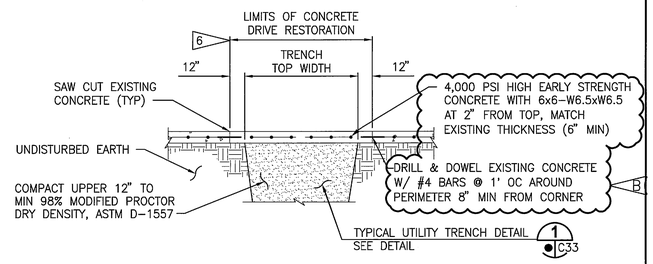



NOTE:
REPLACE EXISTING CURBS AS NEEDED PER FDOT INDEX 300.

## ASPHALT PAVEMENT RESTORATION DETAIL 1
NTS C35

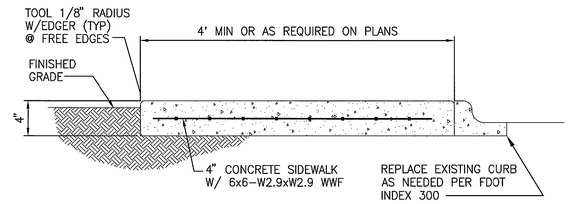



## LIMEROCK RESTORATION DETAIL 2
NTS C35



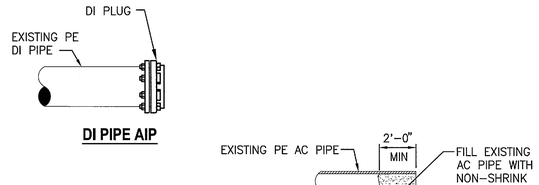

NOTES:
A. DRILL AND DOWEL 1 LOCATION EACH SIDE FOR CURB REPAIR.
B. MATCH EXISTING GRADE AND FINISH.
C. REPLACE EXISTING CURBS AS NEEDED PER FDOT INDEX 300.
D. WATER TO CEMENT RATIO SHALL NOT EXCEED 0.45
E. PLACE CONTRACTION JOINTS @12' OC (MAX)
F. CONCRETE SHALL BE CURED MOIST, BY SPRAYING OR FOGGING, FOR FIRST 48 HOURS (MIN)

## CONCRETE RESTORATION DETAIL 3
NTS C35

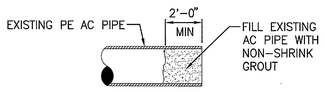



NOTES:
A. TOOL JOINTS SHALL BE LOCATED 5' APART ALONG THE LENGTH OF THE SIDEWALK.
B. CONTROL JOINTS SHALL BE LOCATED AT 10' SPACING ALONG THE LENGTH OF THE SIDEWALK. CONTROL JOINTS SHALL INCLUDE THE CONSTRUCTION OF 1/2" WIDE EXPANSION JOINT MATERIAL FOR THE DEPTH AND WIDTH OF THE SIDEWALK.
C. MATCH EXISTING SIDEWALK DEPTH, WIDTH, JOINT AND CONTROL JOINT LOCATIONS AS REQUIRED.

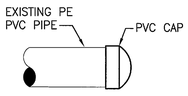
## CONCRETE SIDEWALK RESTORATION DETAIL 4
NTS C35




## DI PIPE AIP

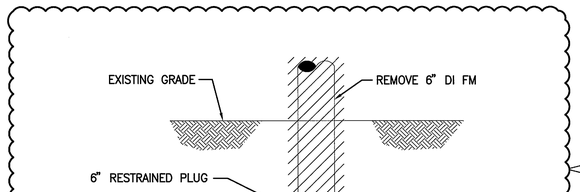



## AC PIPE AIP

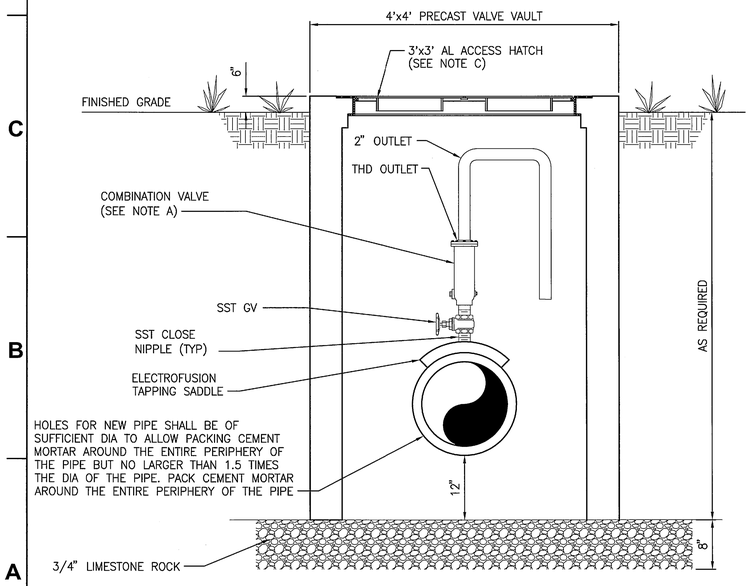



## PVC PIPE AIP

## CAP DETAIL 5
NTS C35

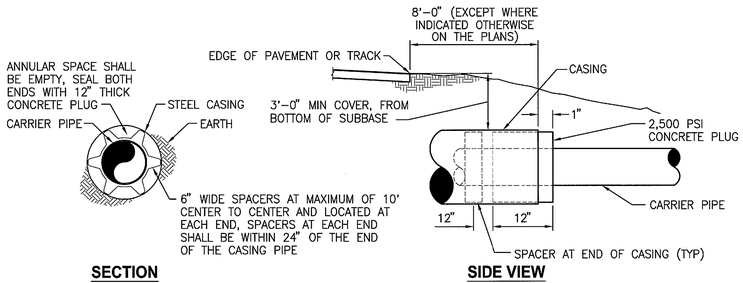



## TYPICAL FORCEMAIN REMOVAL DETAIL 6
NTS C2 C35




NOTES:
A. FOR SEWAGE FORCE MAINS, REPLACEMENT VALVE SIZE SHALL MATCH EXISTING VALVE TO BE REPLACED.
B. THE VALVE VAULT IS NOT DESIGNED FOR VEHICULAR TRAFFIC LOADS AND IS NOT INTENDED FOR PLACEMENT WITHIN THE TRAVELED WAY.
C. CAST IN PLACE ALUMINUM ACCESS HATCH SHALL BE PER SPECIFICATION SECTION 05 50 13.

## TYPICAL UNDERGROUND COMBINATION AIR RELEASE VALVE DETAIL 7
NTS C35




## SECTION

## SIDE VIEW

| CARRIER PIPE NOMINAL DIAMETER | CASING | |
|---|---|---|
| | DIA | MIN WALL THICKNESS |
| 2" | 6" | 0.375" |
| 4" | 8" | 0.375" |
| 6" | 20" | 0.375" |
| 8" | 22 | 0.375" |
| 10" | 24" | 0.375" |
| 12" | 30" | 0.375" |

## TYPICAL SLEEVED PIPE DETAIL 8
NTS C35

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | REVISED DETAIL 3, ADDED DETAIL 6 | 03/07/12 | |
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
## FORCE MAINS
## CIVIL DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
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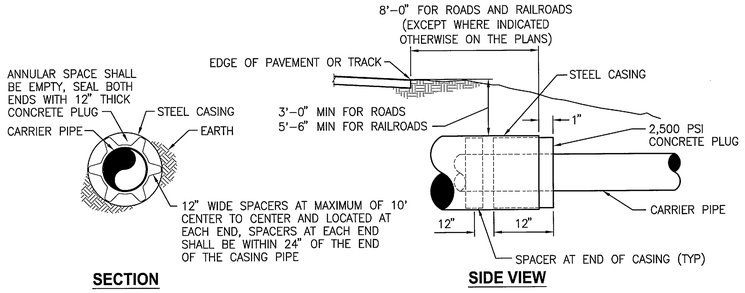
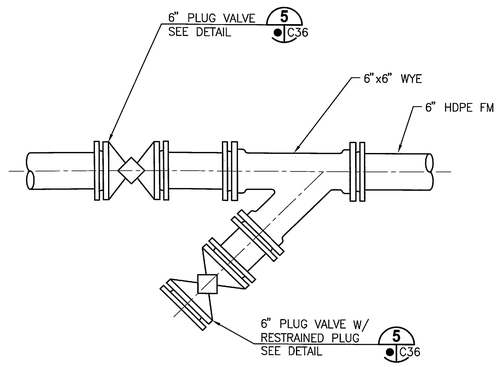



| CARRIER PIPE NOMINAL DIAMETER | RAILROAD CASING DIA | RAILROAD CASING MIN WALL THICKNESS |
|---|---|---|
| 2"-3" | 6" | 0.375" |
| 4" | 8" | 0.375" |
| 6" | 12" | 0.375" |

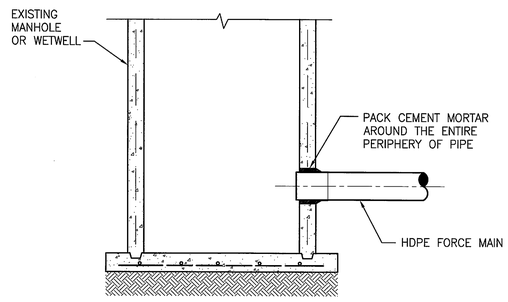
NOTES:
A. ALL HDPE CARRIER PIPE SHALL BE JOINTED BY BUTT FUSION.

B. CONTRACTOR TO PROVIDE ALL NECESSARY PIPE SPECIALS, CONNECTOR PIECES, AND RESTRAINT ITEMS TO PROPERLY TRANSITION FROM CARRIER PIPE TO FORCE MAIN MADE OF OTHER MATERIALS (HDPE, PVC, ETC) AND PROVIDE RESTRAINT.

## TYPICAL JACK AND BORE DETAIL 1 C36
NTS

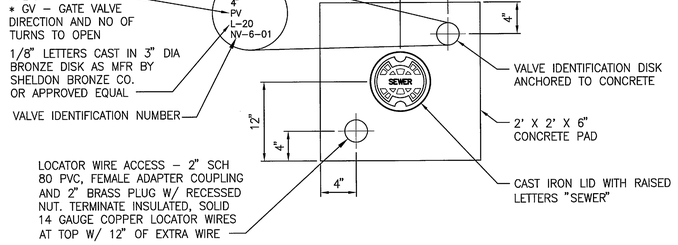


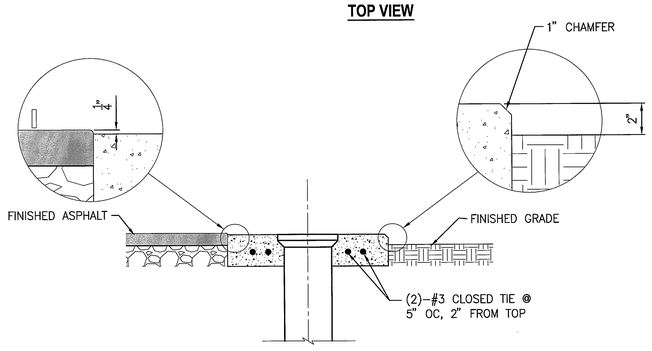

## STUB-OUT FOR FUTURE CONNECTION DETAIL 2 C6 C36
NTS




NOTE:
IF THERE IS NOT AN EXISTING OPENING THEN HOLES FOR NEW PIPE SHALL BE CENTERED ON THE STRUCTURE AND BE OF SUFFICIENT DIA TO ALLOW PACKING CEMENT MORTAR AROUND THE ENTIRE PERIPHERY OF THE PIPE BUT NO LARGER THAN 1.5 TIMES THE DIA OF THE PIPE. CUTTING THE STRUCTURE SHALL BE DONE IN A MANNER THAT WILL CAUSE THE LEAST DAMAGE TO THE WALLS.

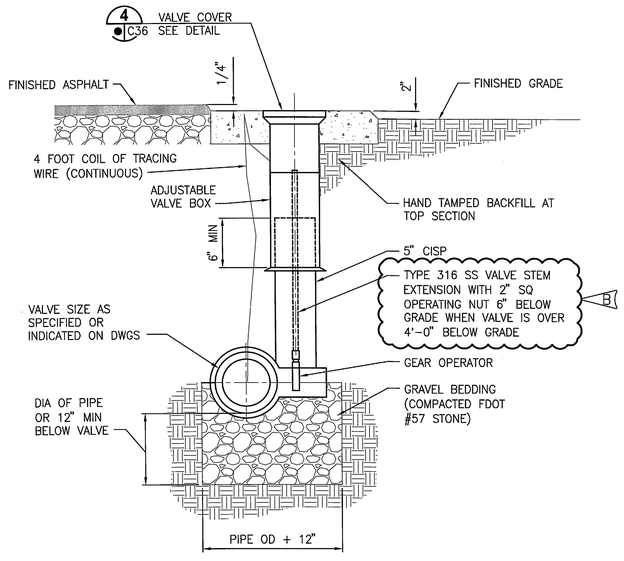
## TYPICAL FORCE MAIN CONNECTION TO SANITARY MANHOLE OR WETWELL 3 C36
NTS



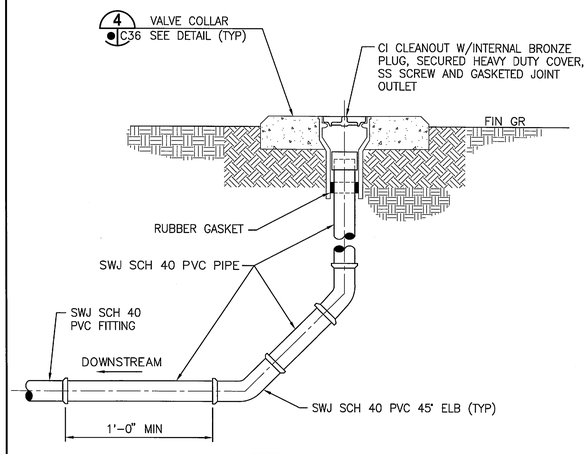




NOTE:
PROVIDE EMBOSSED SS TAG SECURED TO VALVE BODY W/ SS AIRCRAFT CABLE CONTAINING DUPLICATE INFORMATION SHOWN ON IDENTIFICATION DISC.

## VALVE COLLAR AND IDENTIFICATION DISK DETAIL 4 C36
NTS




## BURIED PLUG VALVE AND BOX DETAIL 5 C36
NTS




## SECTION

NOTE:
SIZE OF PIPE, FITTINGS, CLEANOUT, ETC. SHALL BE AS REQUIRED FOR CONNECTION TO 4" WET WELL INFLUENT PIPING.

## CLEANOUT DETAIL 6 C36
NTS

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | REVISED DETAIL 5 | 03/07/12 | |
| A | | GENERAL REVISIONS | 10/31/11 | |

REVISIONS

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| SIGNATURES | DATE |
|---|---|
| DRAWN J. ALLEN | 12/05/11 |
| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| APPROVED M. CLARK | |
| K. MILLER | |

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JOHN F. KENNEDY SPACE CENTER, NASA
KENNEDY SPACE CENTER, FLORIDA

# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5
# FORCE MAINS
# CIVIL DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |

PROJ. NO. 96968.3 SHEET 44

C36

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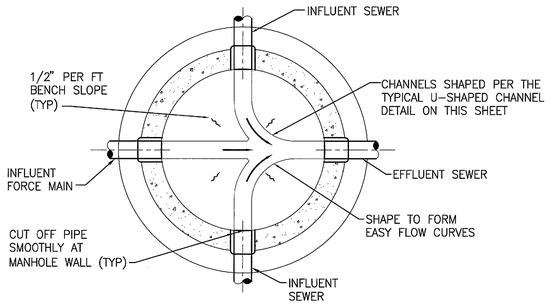
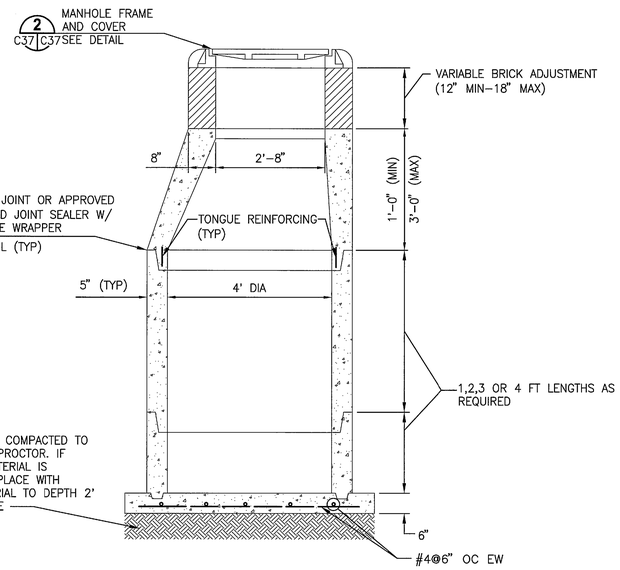


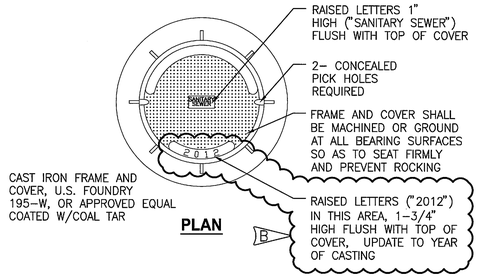

**PLAN**



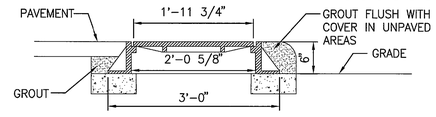

**SECTION**

NOTES:
1. FOR ALL MANHOLE TYPES, IF BASE RESTS IN CLAY SOILS, EXCAVATE AN ADDITIONAL 24", AND BACKFILL IN AND AROUND STRUCTURE "FULL DEPTH" WITH ASTM A-3 RATED MATERIAL. CONNECTIONS AND GROUTING IN MANHOLE NOT SHOWN.
2. FOR SEWER PIPE CONNECTIONS LOCATIONS AND INVERTS, SEE PIPE DRAWINGS FOR DETAILS REGARDING SEWER PIPE CONNECTIONS TO MANHOLE, SEE TYPICAL INFLUENT, EFFLUENT AND FORCE MAIN CONNECTIONS DETAILS ON THIS SHEET.

## PRECAST CONCRETE MANHOLE DETAIL 1 C37
NTS

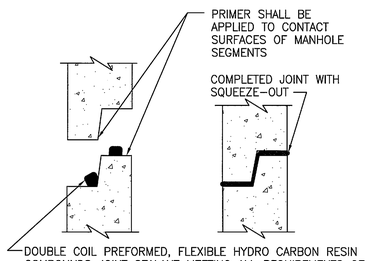



**PLAN**

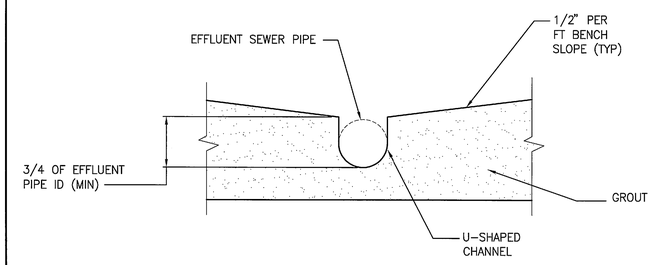



**SECTION**

## MANHOLE FRAME AND COVER DETAIL 2 C37 C37
NTS




## TYPICAL PRECAST SEGMENT JOINT DETAIL W/ SEALANT 3 C37 C37
NTS




## TYPICAL U-SHAPED CHANNEL DETAIL 5 C37
NTS

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| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| B | | MOVED DETAIL 4 TO C35 | 03/07/12 | |
| A | | GENERAL REVISIONS | 12/05/11 | |

REVISIONS

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| CHECKED M. CLARK | 12/05/11 |
| SUBMITTED R. BEST | 12/05/11 |
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| K. MILLER | |

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**REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5**
**FORCE MAINS**
**CIVIL DETAILS (OPTION 1)**

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | B |
| PROJ. NO. 96968.3 | | SHEET 45 | |

C37

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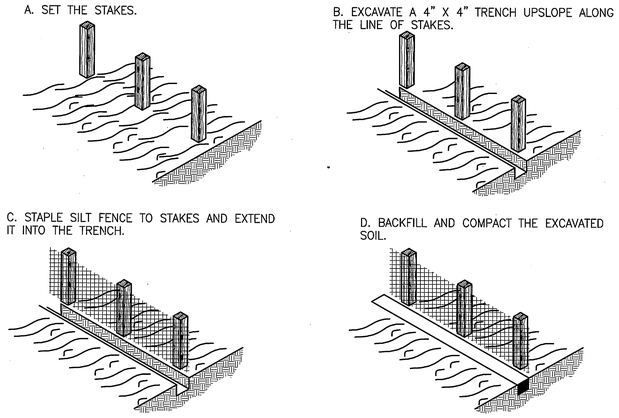
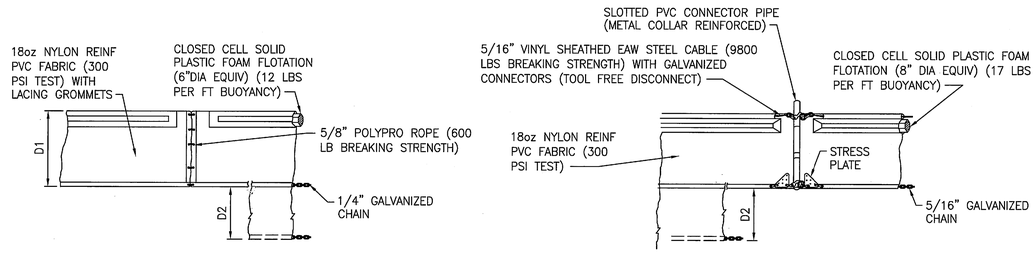



## CONSTRUCTION OF A SILT FENCE DETAIL 1
NTS — C38

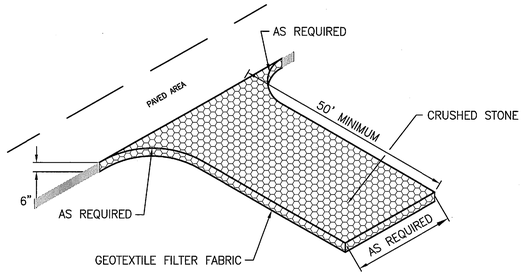



D1 =5' STD (SINGLE PANEL FOR DEPTHS 5' OR LESS)
D2 =5' STD (ADDITIONAL PANEL FOR DEPTHS 5')

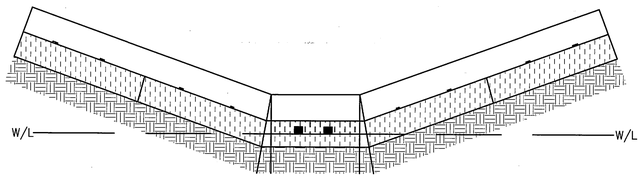
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET. TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALL FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER.

NOTICE: COMPONENTS OF TYPES 1 AND 2 MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES 1 AND 2 SHALL BE AS APPROVED BY THE ENGINEER.

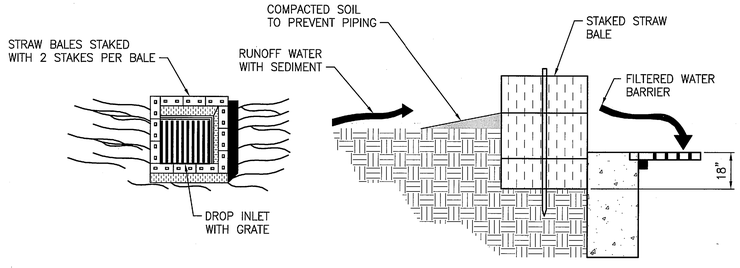
## TYPICAL FLOATING TURBIDITY BARRIER DETAIL 2
NTS — C38




## STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL 3
NTS — C38

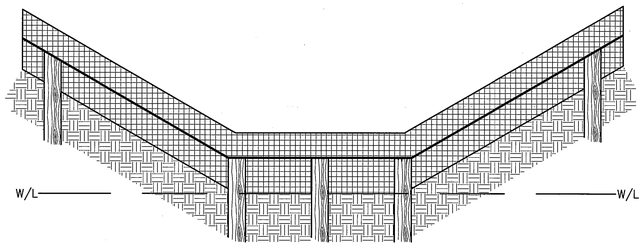



## PROPER PLACEMENT OF A STRAW BALE IN A DRAINAGE WAY DETAIL 4
NTS — C38

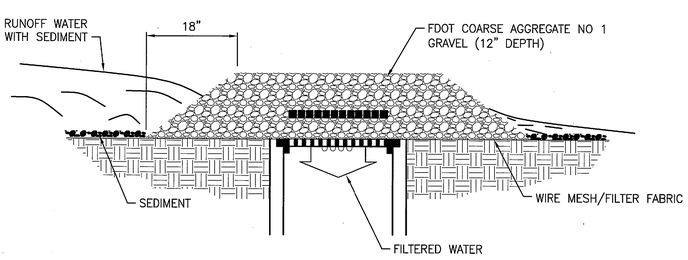



SPECIFIC APPLICATION
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5%) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 5.3 CFS) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

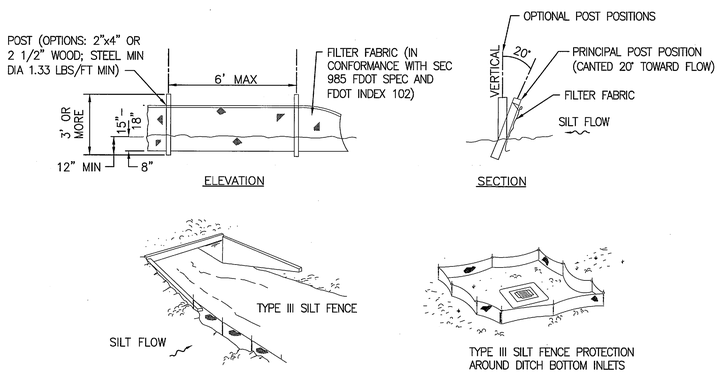
## STRAW BALE DROP INLET SEDIMENT FILTER DETAIL 5
NTS — C38




## PROPER PLACEMENT OF A SILT FENCE IN A DRAINAGE WAY DETAIL 6
NTS — C38




## GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER DETAIL 7
NTS — C38




### TYPE III SILT FENCE

NOTES:
A. DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

B. WHEN JOINING BUTT ENDS OF SILT FENCE FABRIC; JOIN FABRIC ENDS, WRAP AROUND A POST 360–DEGREES, AND SET POST.

## FDOT INDEX NUMBER 102 SILT FENCE DETAIL 8
NTS — C38

THIS SPACE RESERVED

| SYM | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| A | | GENERAL REVISIONS Added | 10/31/11 | KM |

REVISIONS

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| SUBMITTED C R. BEST | 10/31/11 |
| ST of LICENSURE: FL LICENSE NO: 69875 | |
| M. CLARK | 10/31/11 |
| K. MILLER | 11/1/11 |

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# REVITALIZE WATER & WASTEWATER SYSTEMS - VOLUME 3 OF 5 FORCE MAINS

## STORMWATER POLLUTION PREVENTION DETAILS

| FILE NO. | SIZE | DWG. NO. | REV |
|---|---|---|---|
| | F | 79K38877 VOL 3 | A |
| PROJ. NO. 96968.3 | | SHEET 46 of 46 | |

C38

FSC FORM 1–11 (3/76)(C/G 3/94)