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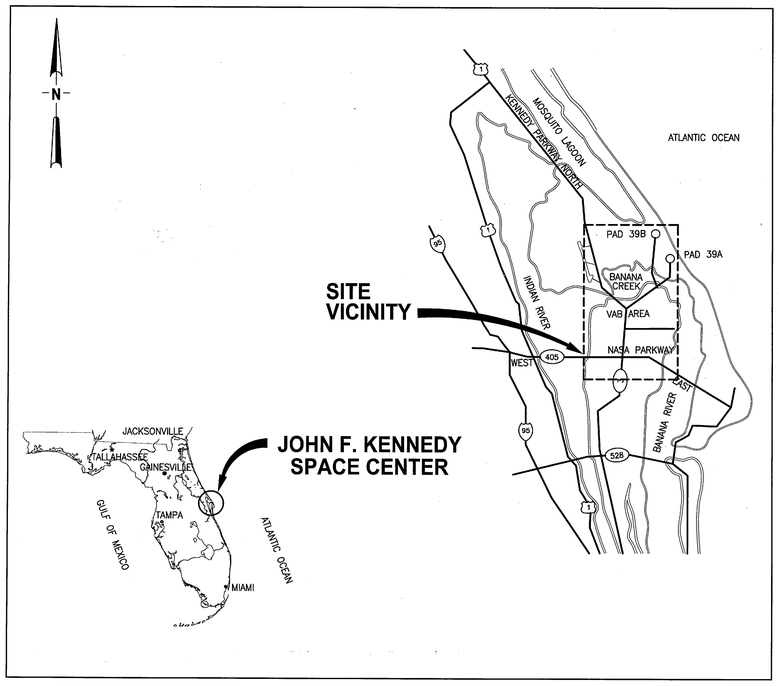
SPECIFICATION REFERENCE NO 79K38878

REVITALIZE WATER & WASTEWATER SYSTEMS

VOLUME 3 OF 5 - FORCE MAINS



SITE VICINITY MAP

NTS

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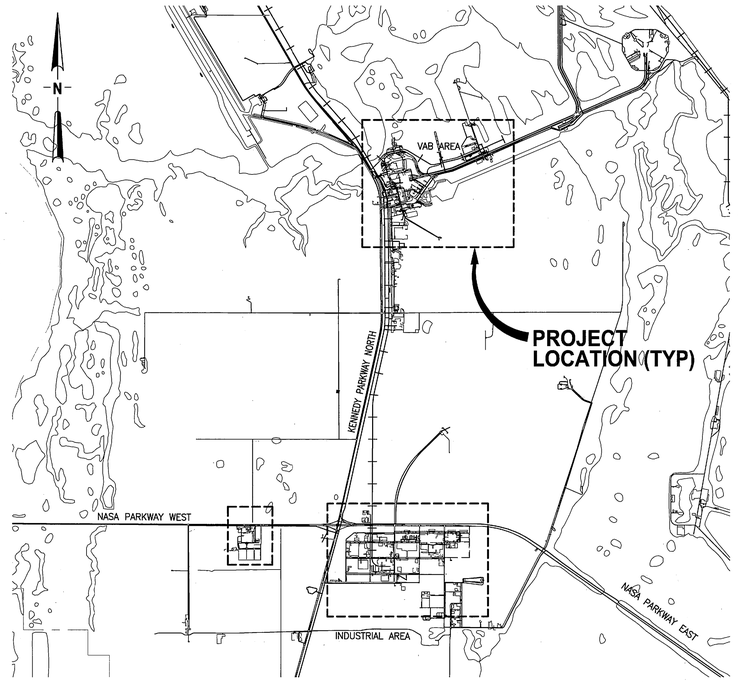

PROJECT LOCATION MAP

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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(Stamp Revision: (05-19-2009)

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A		GENERAL REVISIONS revise 1-41, Add 42-46	10/31/11	KM

REVISIONS

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K. MILLER	11/1/11
P.Y. YU	12/9/11

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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	A
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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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

DRAWING INDEX AND ABBREVIATIONS

FILE NO.	SIZE	DWG. NO.	REV
	F	79K38877 VOL 3	A
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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A		GENERAL REVISIONS	12/05/11	

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LICENSE NO: 48898	
APPROVED M. CLARK	12/5/11
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

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

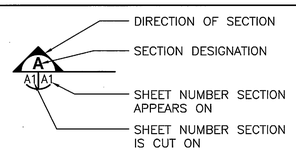
DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE
		NEW PIPE (ABOVE GROUND)
		NEW PIPE (BELOW GROUND)
		EXISTING PIPE TO BE REMOVED
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT
		FLEXIBLE COUPLING ADAPTER
		HUB & SPIGOT JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH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

MECHANICAL LEGEND

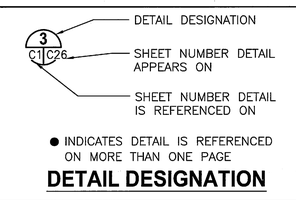
DOUBLE LINE	SINGLE LINE	
		ELBOW UP
		ELBOW DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		TEE
		TEE W/ RESTRAINED PLUG
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ELBOW, 11.25 DEGREE
		ABANDON IN PLACE
		SLEEVE
		WYE

VALVE SYMBOLS

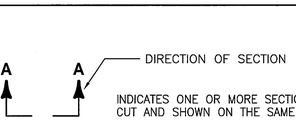
DOUBLE LINE	SINGLE LINE	
		PLUG
		GATE
OR		BUTTERFLY
		BALL
		CHECK
OR		PRESSURE CONTROL
		AIR RELEASE AND/OR VACUUM RELIEF
		PRESSURE SAFETY RELEASE VALVE



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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A		GENERAL REVISIONS	10/31/11	

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ST of LICENSURE: FL LICENSE NO: 48898	
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

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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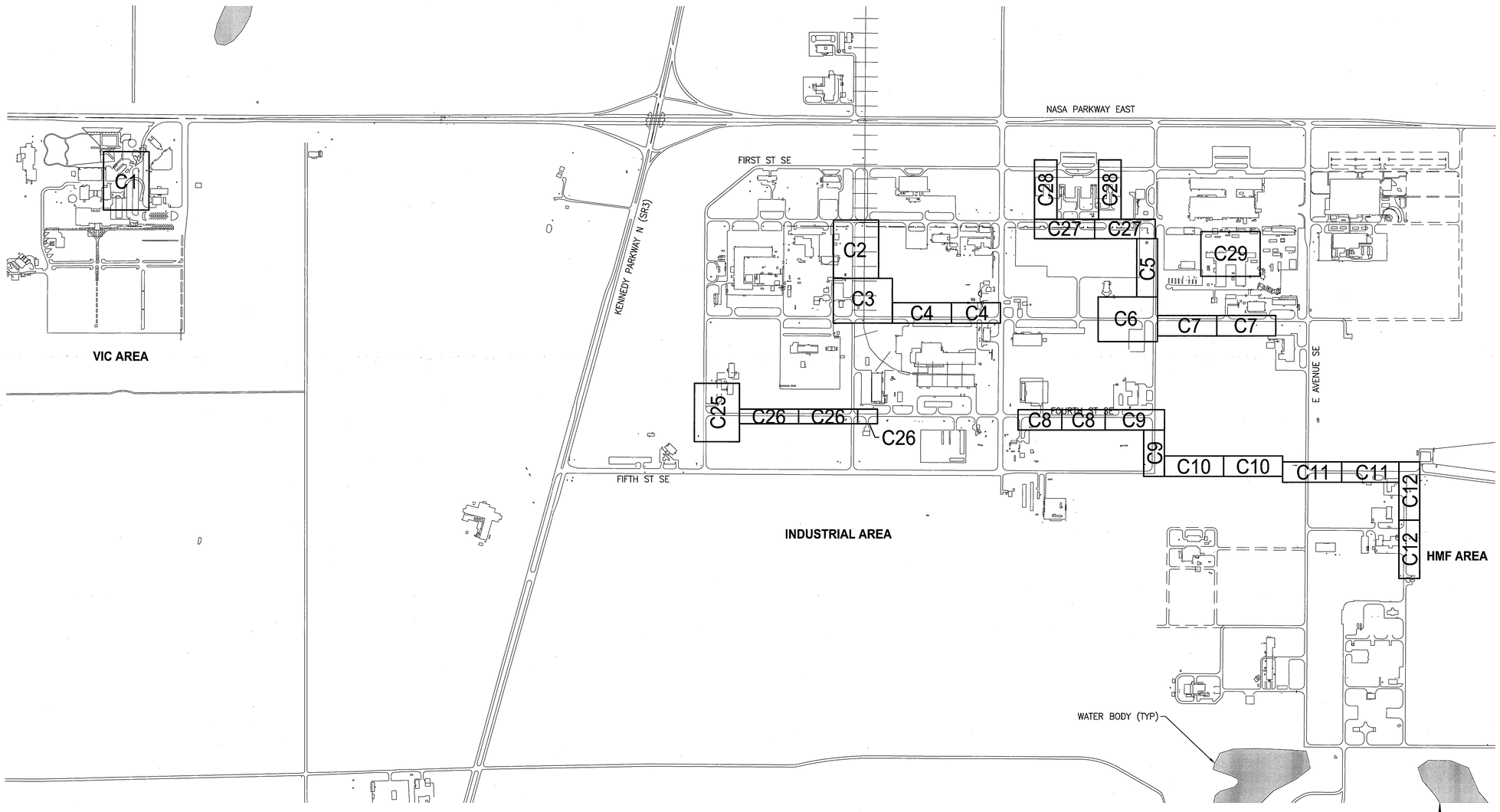

INDUSTRIAL AREA/HMF AREA PLAN

1"=500'

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

N

V5

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

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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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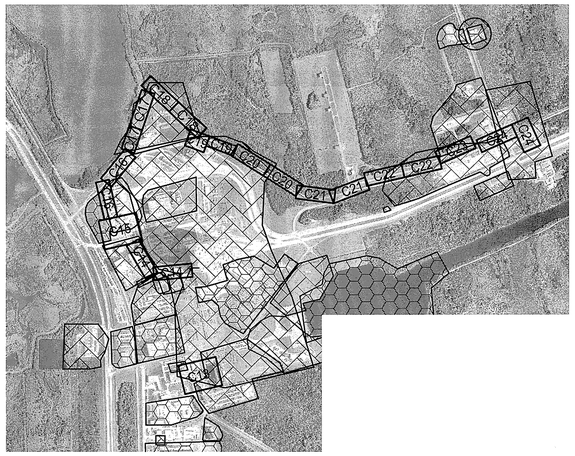
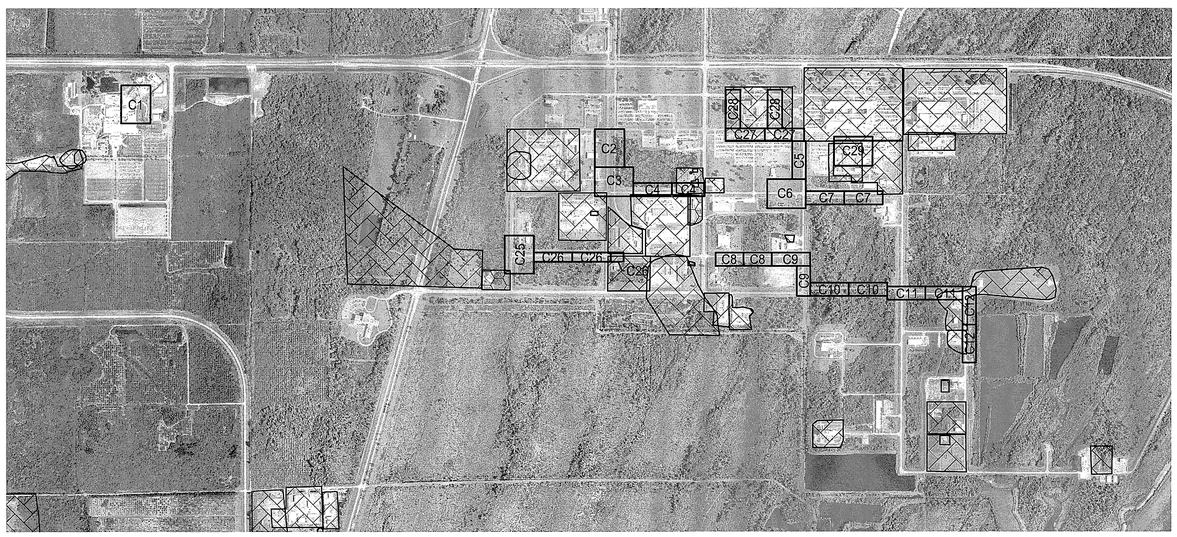
LEGEND

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.

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A		GENERAL REVISIONS	12/05/11	KM

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SUBMITTED K. RIVERA	12/05/11
ST of LICENSURE: FL LICENSE NO: 65681	
APPROVED M. CLARK	12/05/11
K. MILLER	12/5/11

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

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

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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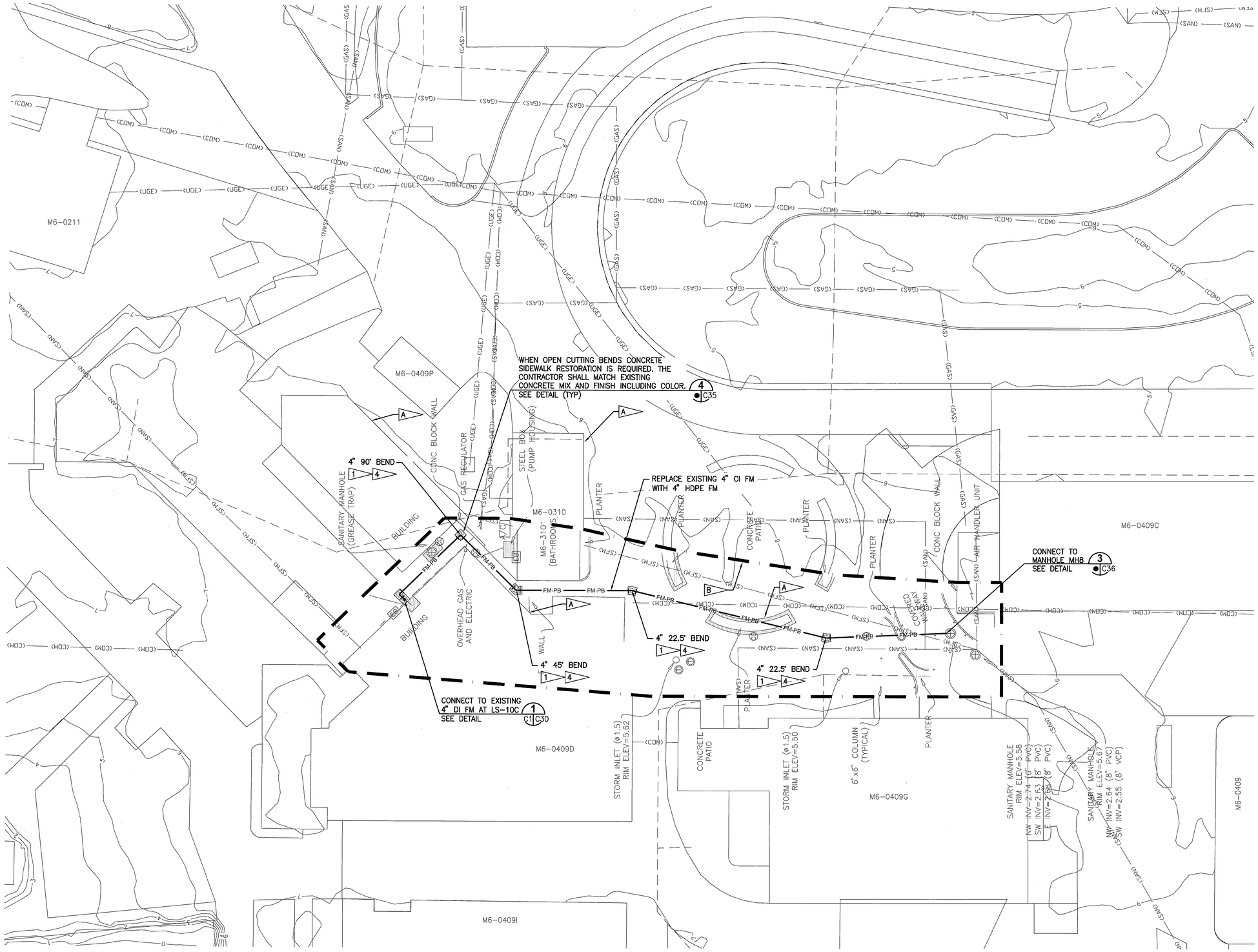
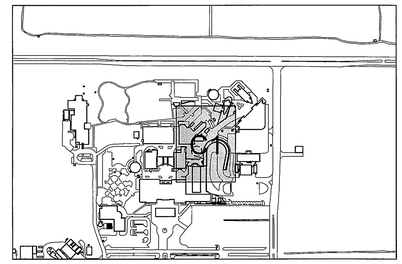


LS-10C PLAN

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.

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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

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

C1

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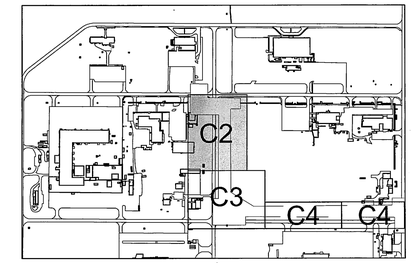

KEY MAP
NTS

10" DI WM 5
TYPICAL FM REMOVAL 4 C2|C37 SEE DETAIL
10" DI WM 5
UTILITY CONFLICT 1 C34 SEE DETAIL (TYP)
EXISTING 6" FM AIP
6" HDPE FM 2
5 6" PLUG VALVE C36 SEE DETAIL 2
ENLARGED PLAN 11 C2|C31 SEE DETAIL
57' FROM EOP
58' FROM EOP
MATCHLINE - SEE C3
EXISTING 6" HDPE FM
LS-1D
10" DI WM 5
6" DI WM 5
10" DI WM 5
10" DI WM 5
(ABANDONED) CONC VAULT
CHILLED-WATER VAULT
RAILROAD
2ND STREET
B AVENUE
EOP 2ND ST
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
CONCRETE FLUME THROAT ELEV=6.95
(ABANDONED) CONC TRENCH
ELECTRIC SUBSTATION
TR6-113
TR6-0113 SANITARY SEWER LIFT STATION (NEW) TOP ELEV=6.72
M6-0492

B AVENUE PLAN
1"=20'

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

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APPROVED M. CLARK	12/05/11
K. MILLER	12/15/11

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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 10	

C2

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

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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'

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A		GENERAL REVISIONS	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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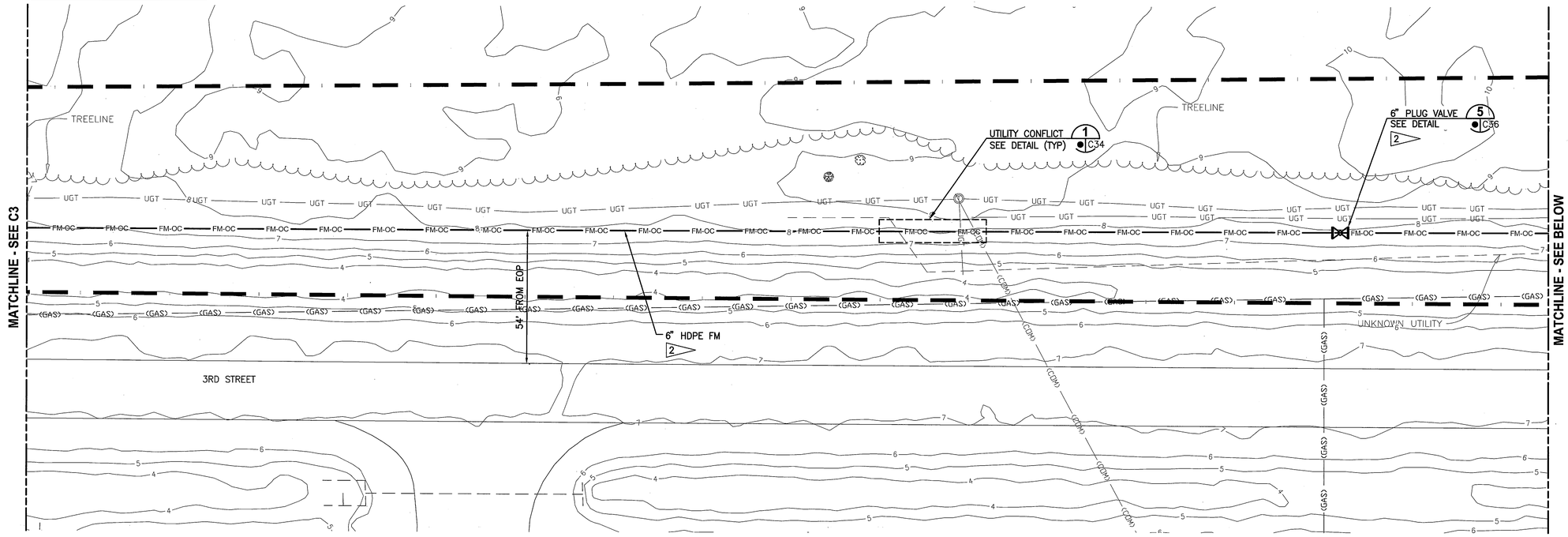
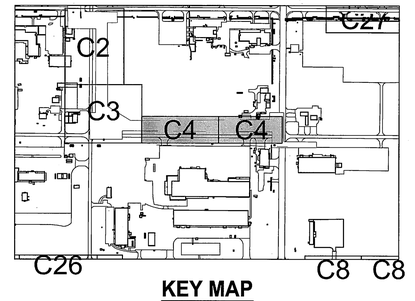


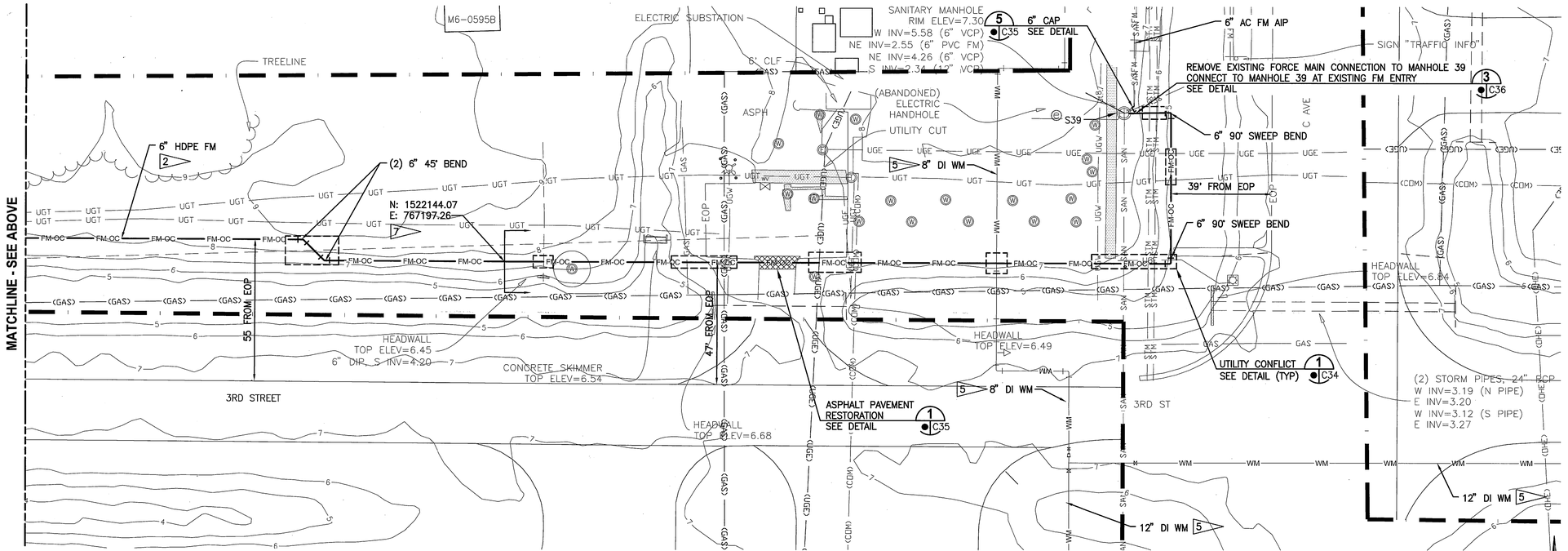
3RD STREET PLAN

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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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 12	

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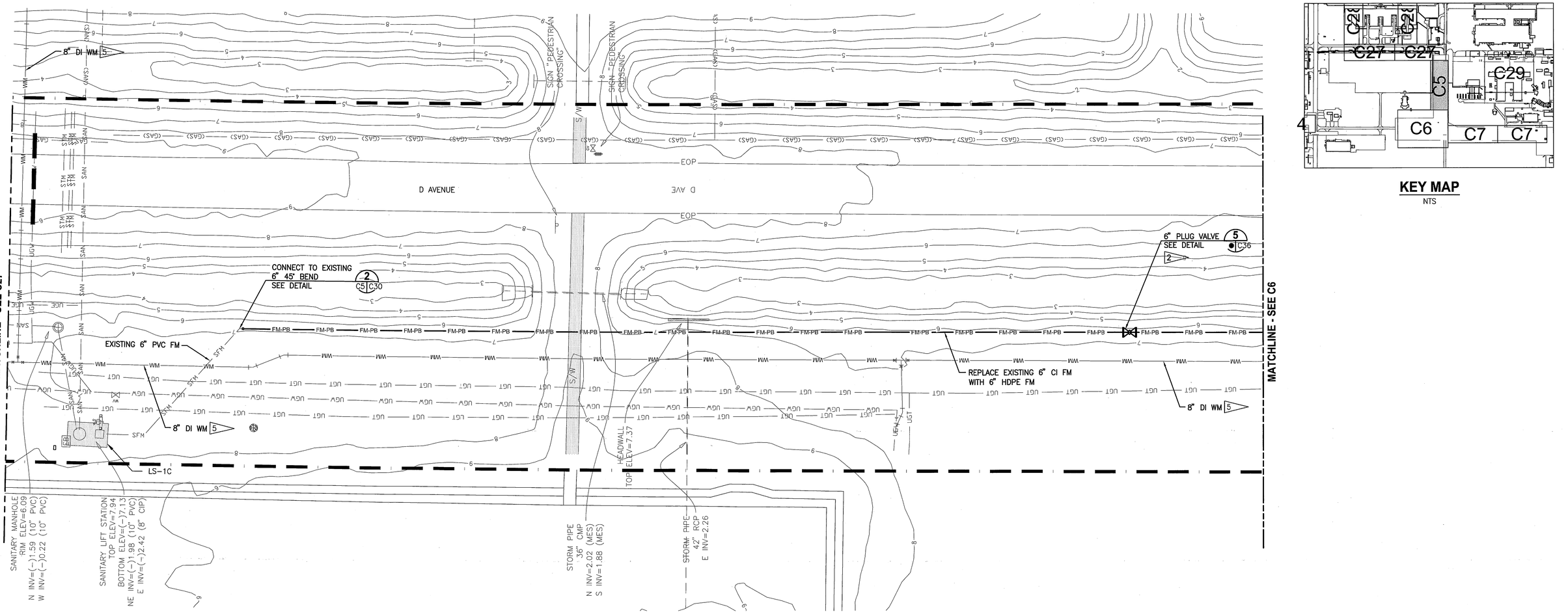

D AVENUE PLAN
1"=20'

KEY MAP
NTS

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

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SYM	ZONE	DESCRIPTION	DATE	APPROVED
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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

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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

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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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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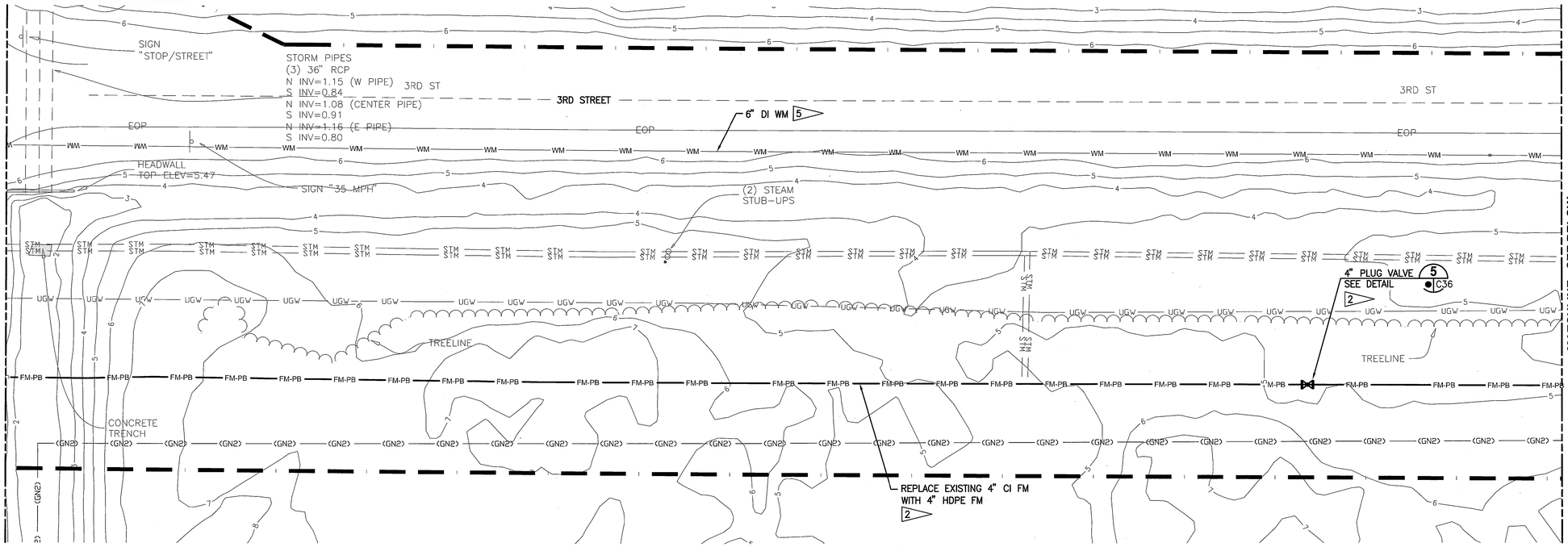
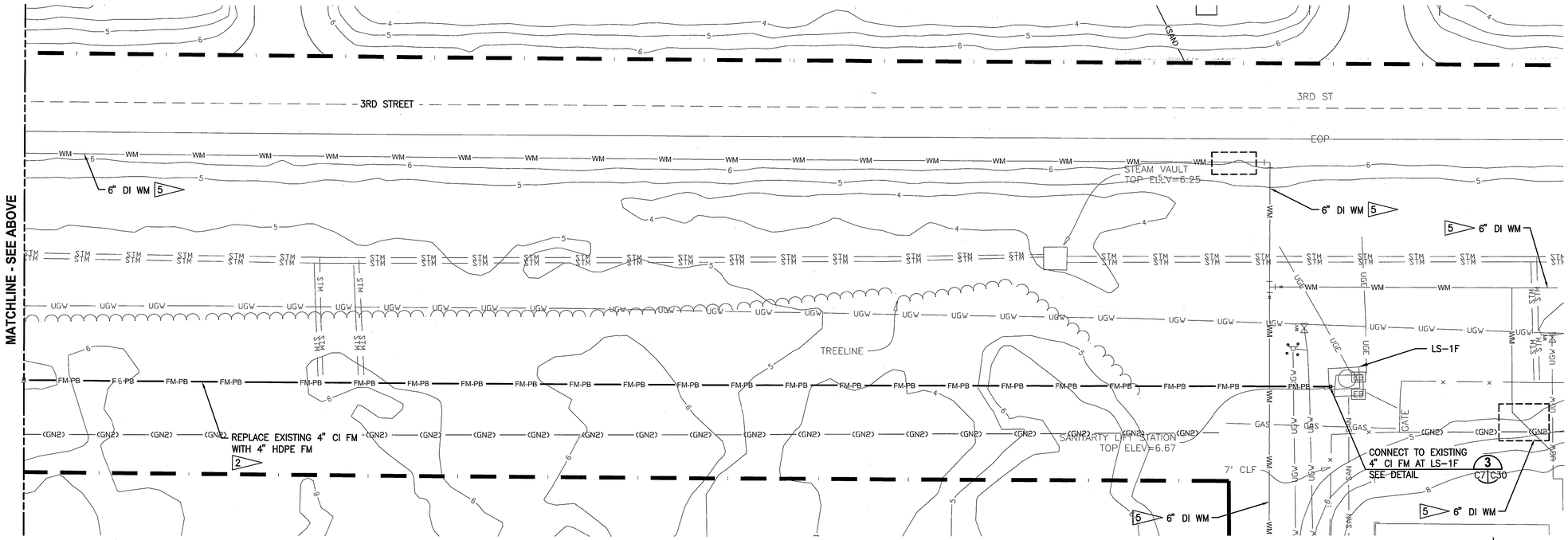


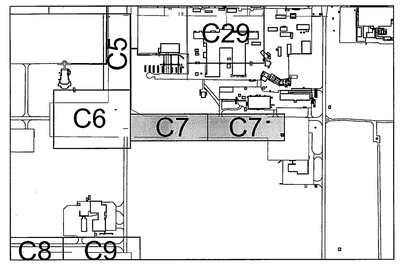
3RD STREET PLAN

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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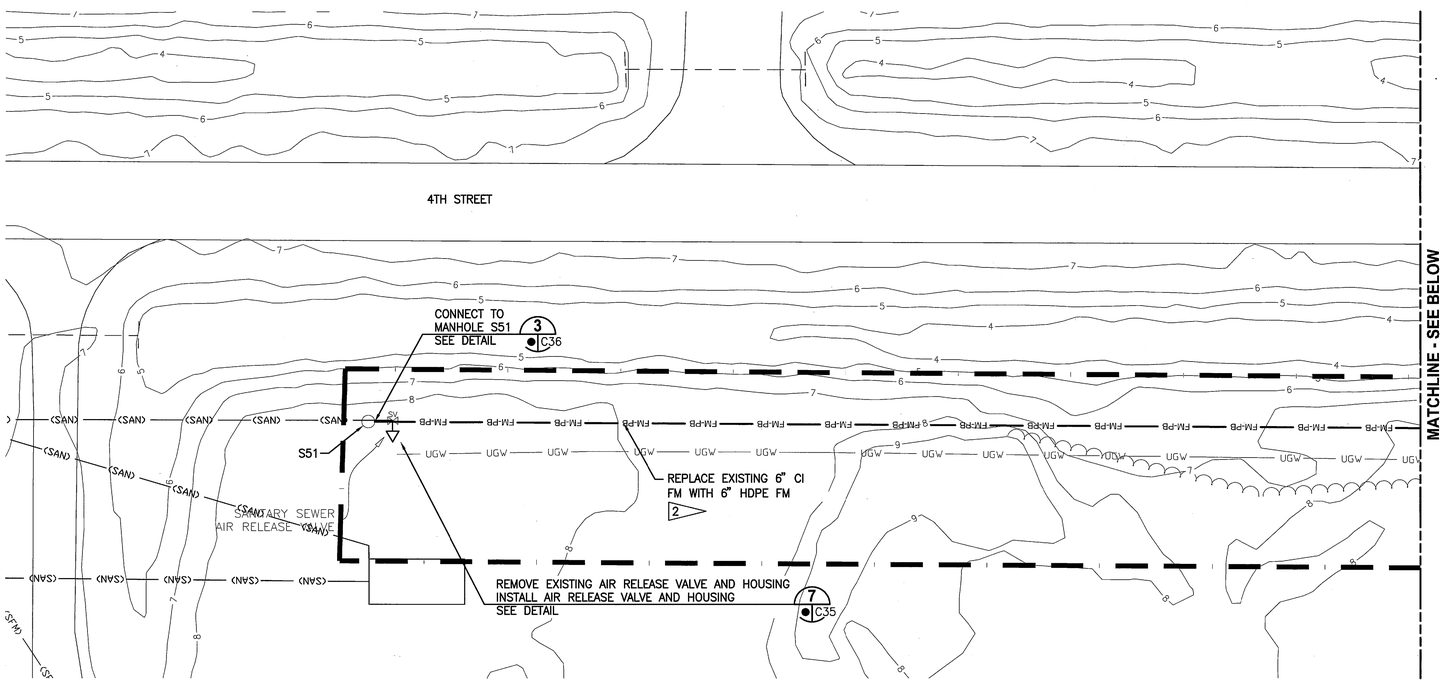
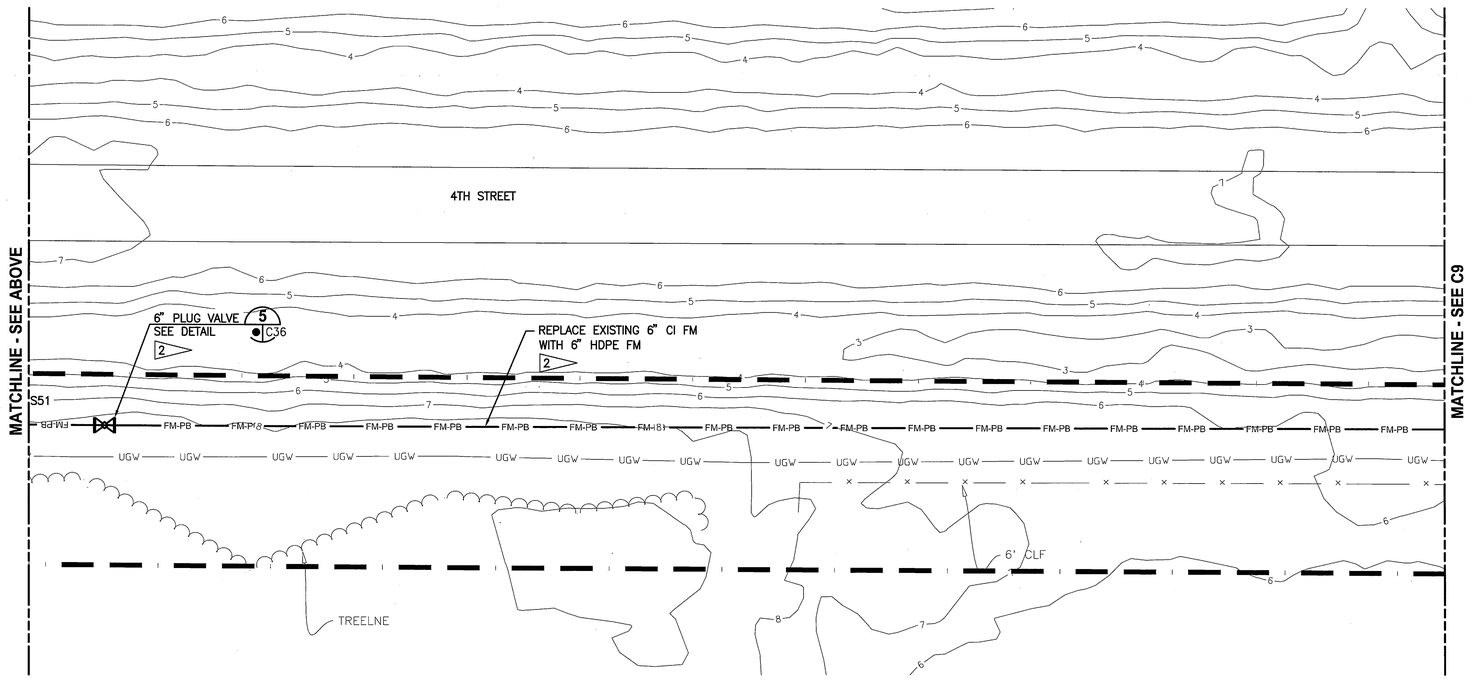
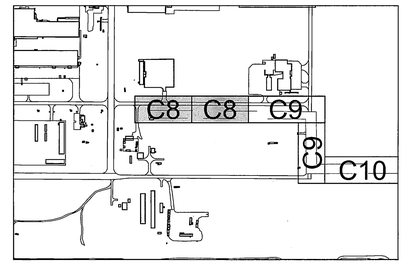


4TH STREET PLAN
1"=20'



4TH STREET PLAN
1"=20'



KEY MAP
NTS

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

N

C8

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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 16	

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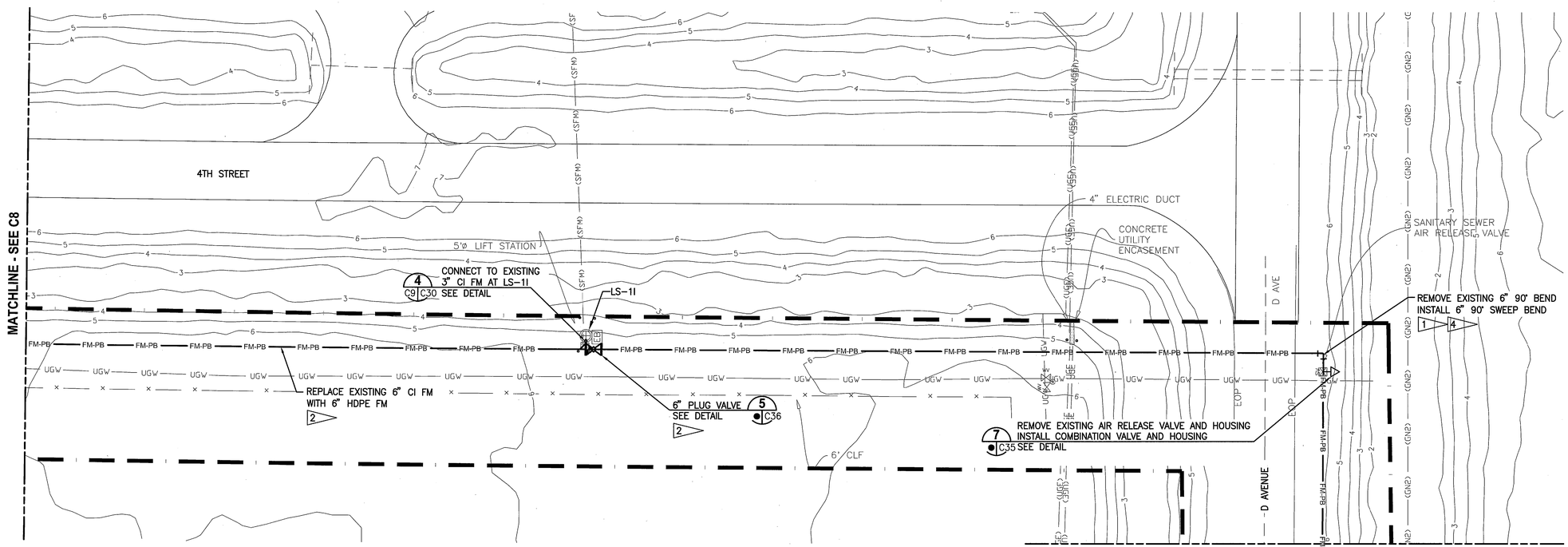
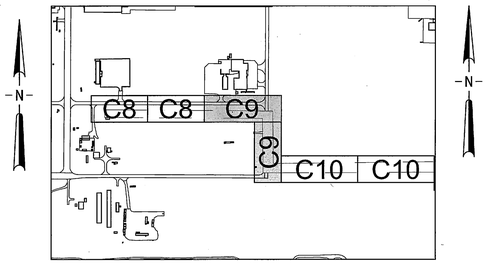


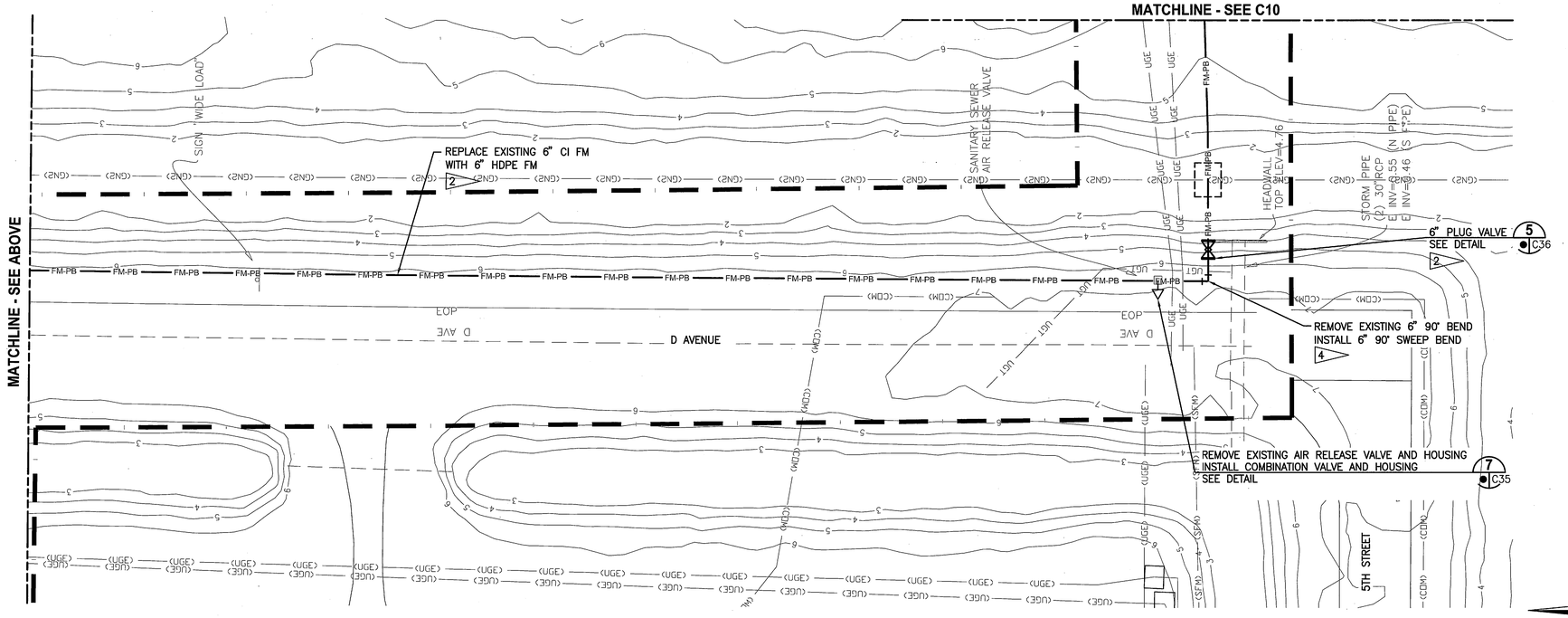
4TH STREET & D AVENUE PLAN

1"=20'



KEY MAP

NTS



D AVENUE PLAN

1"=20'

GRAPHIC SCALE

0 10 20 40

SCALE IN FEET

1"=20'

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

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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 17

C9

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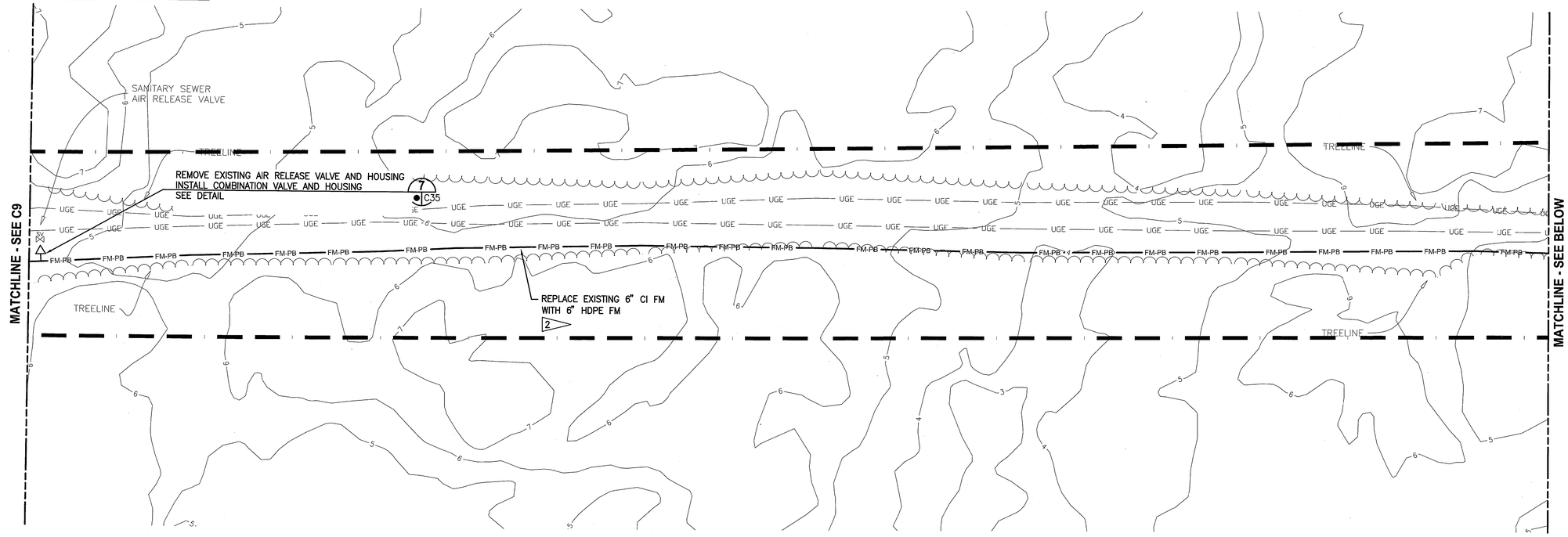
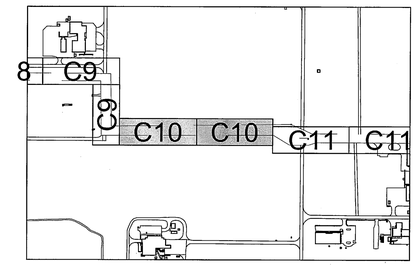


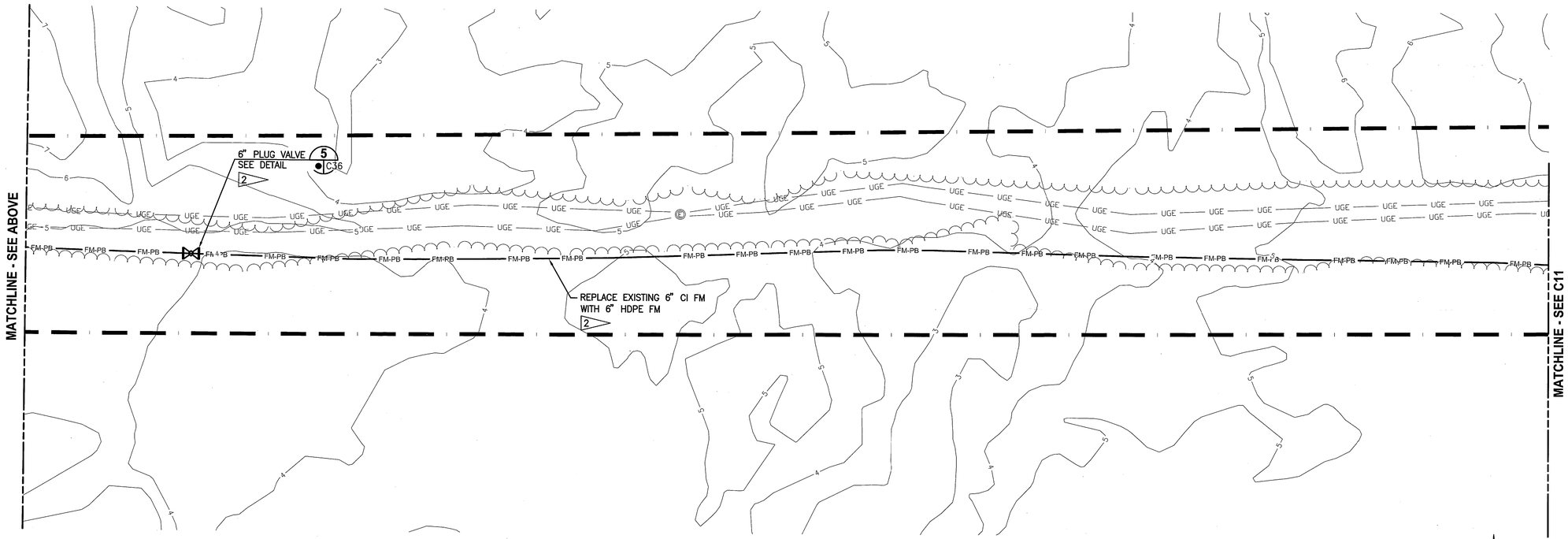
5TH STREET PLAN

1"=20'



KEY MAP

NTS



5TH STREET PLAN

1"=20'

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

N

C10

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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

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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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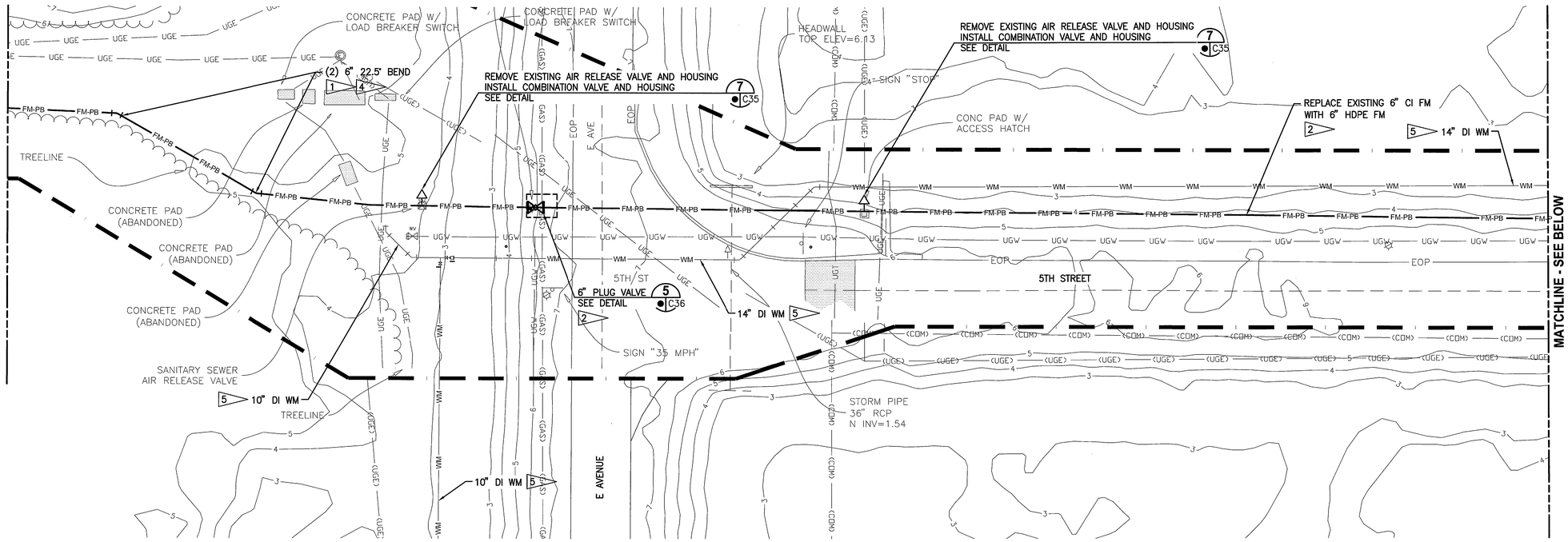
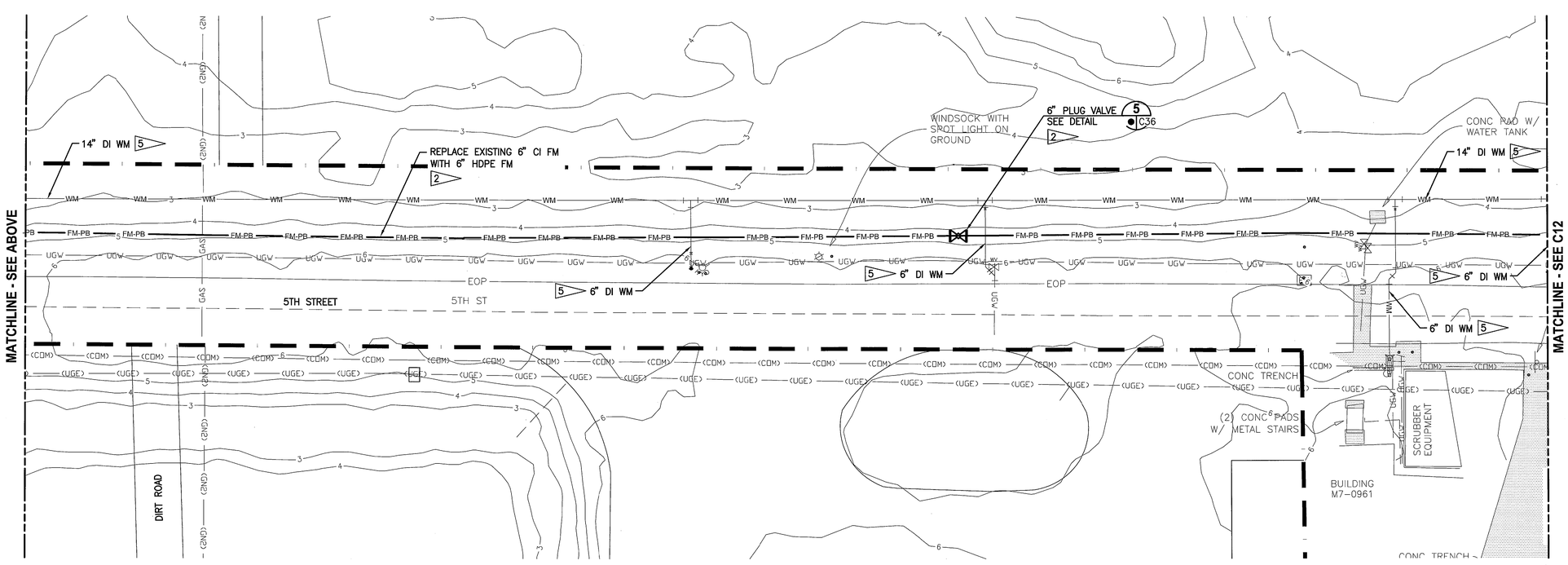


5TH STREET & E AVENUE PLAN

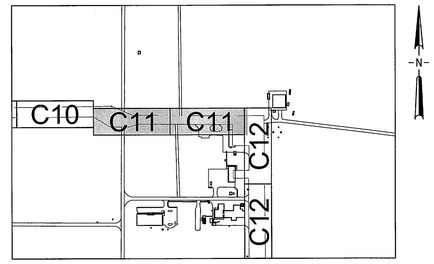
1"=20'



5TH STREET PLAN

1"=20'

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



KEY MAP
NTS

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A		GENERAL REVISIONS	12/05/11	kpa

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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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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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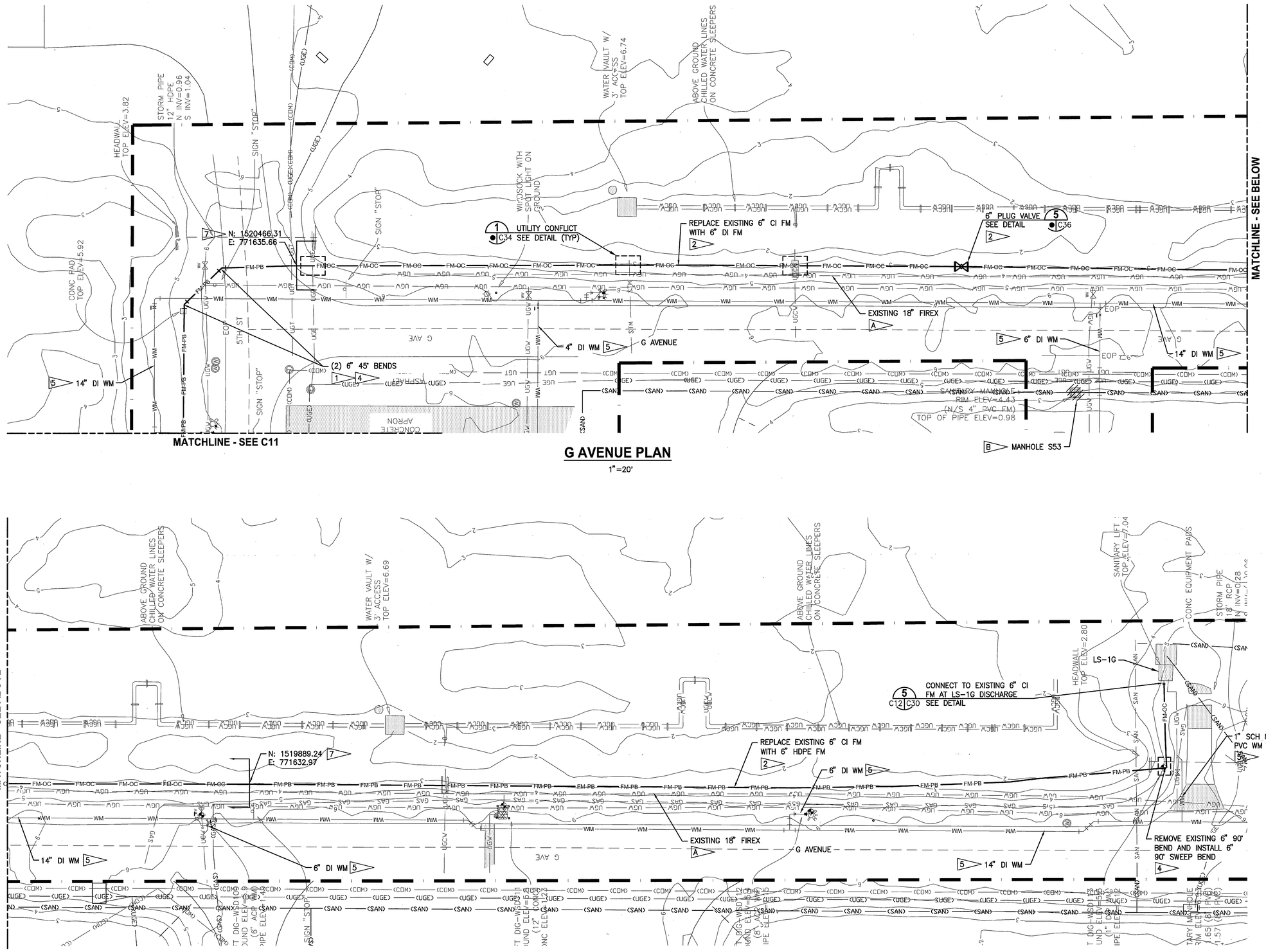

G AVENUE PLAN
1"=20'

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'

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SYM	ZONE	DESCRIPTION	DATE	APPROVED
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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 20	

C12

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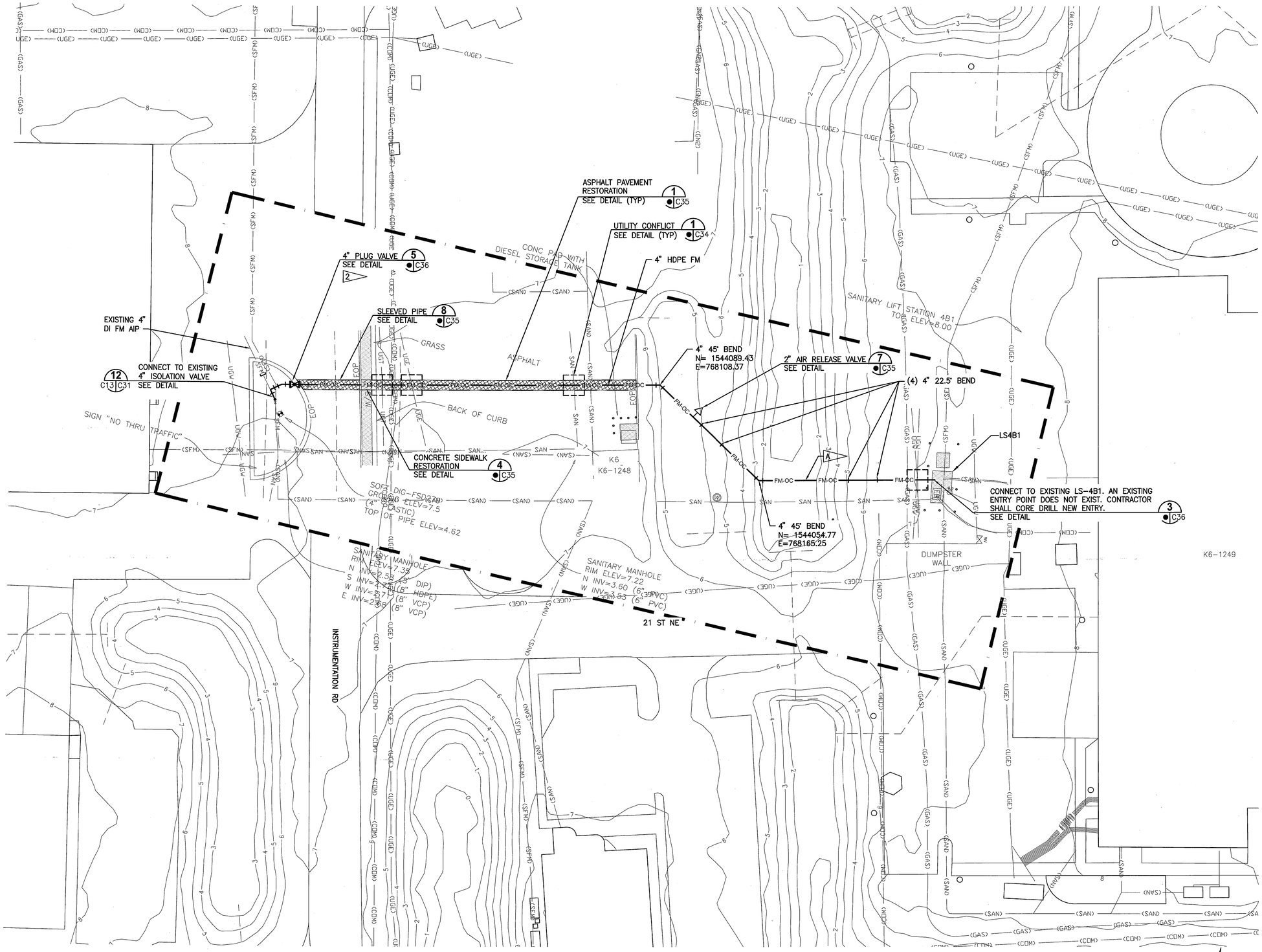
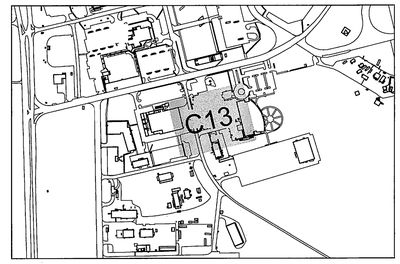


21ST STREET PLAN
1"=20'

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.

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

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M. CLARK	10/31/11
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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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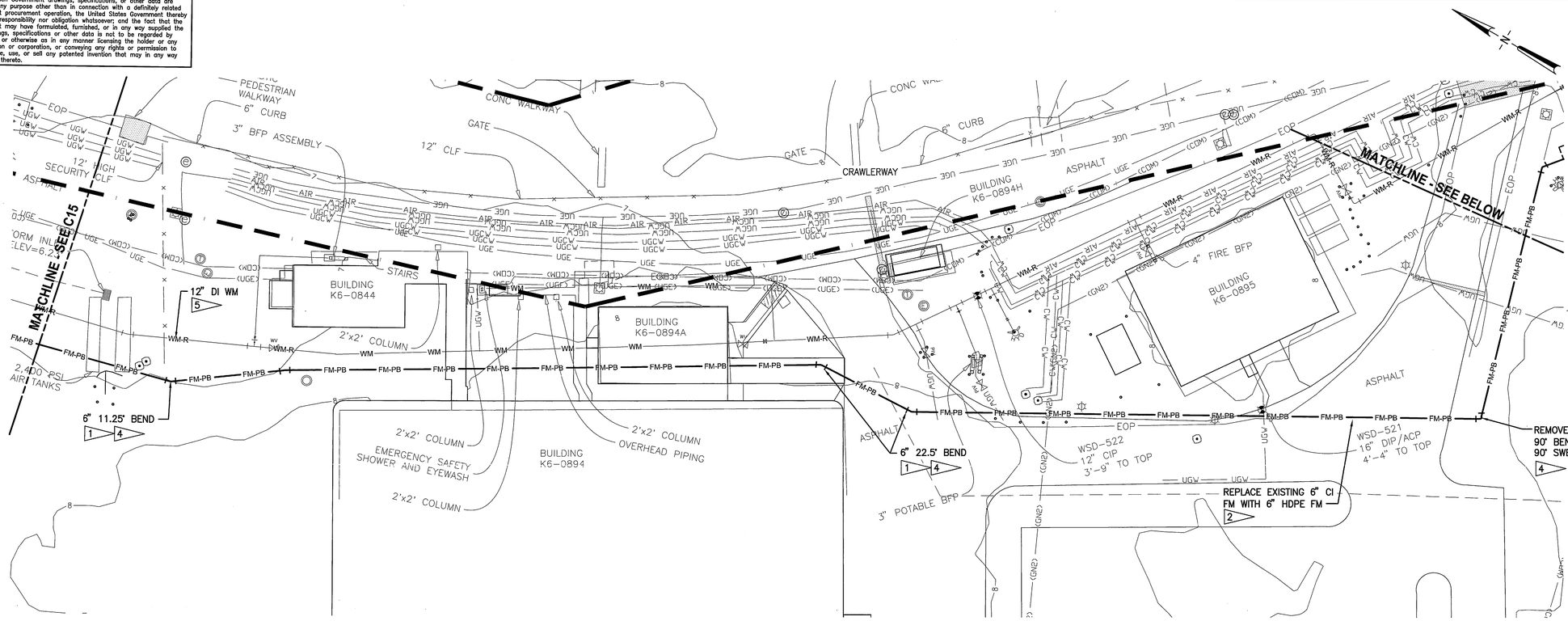
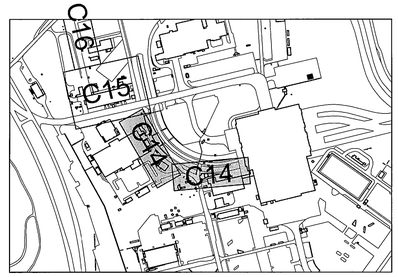


SAFE HAVEN ROAD PLAN

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	

REVISIONS

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K. MILLER	12/5/11

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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 22	

C14

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

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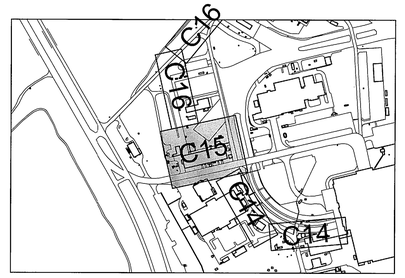
MATCHLINE - SEE C16

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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730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
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	
M. CLARK	12/05/11
K. MILLER	12/15/11

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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 23

C15

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

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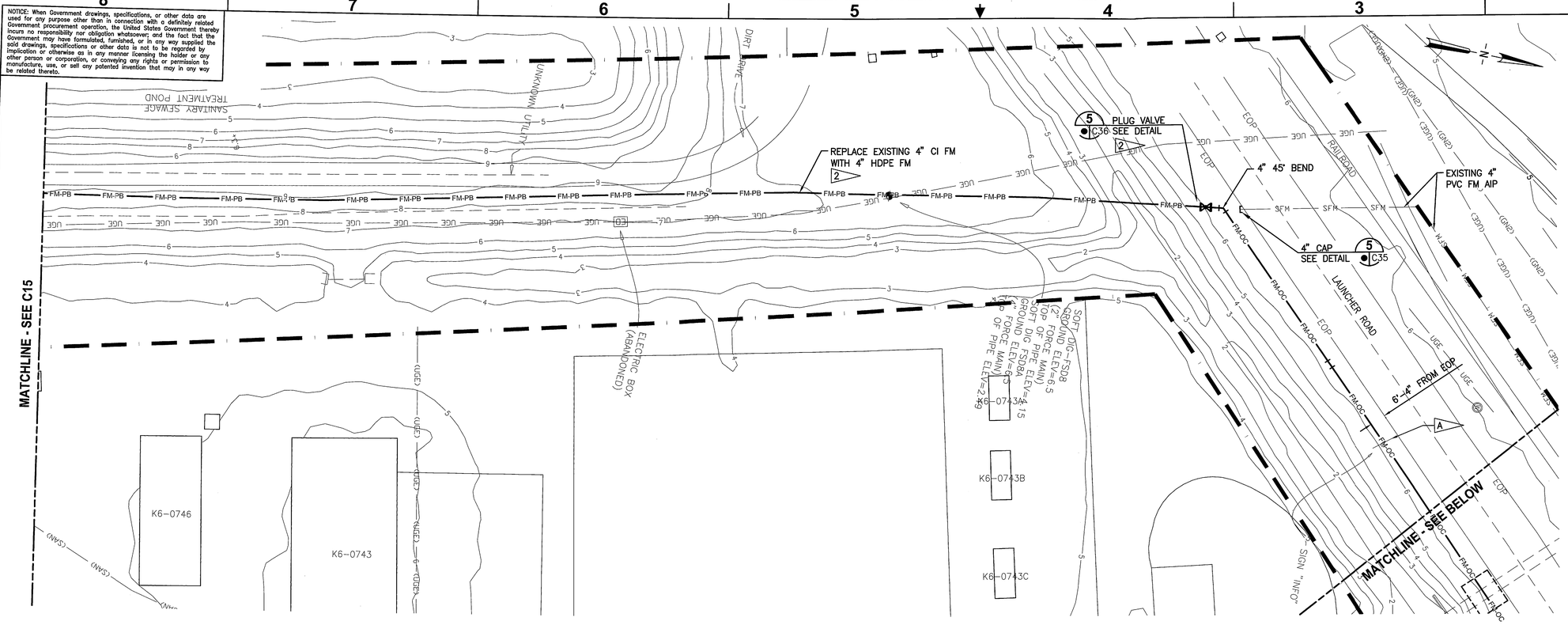
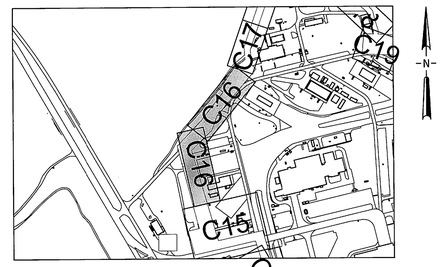


LAUNCHER ROAD PLAN

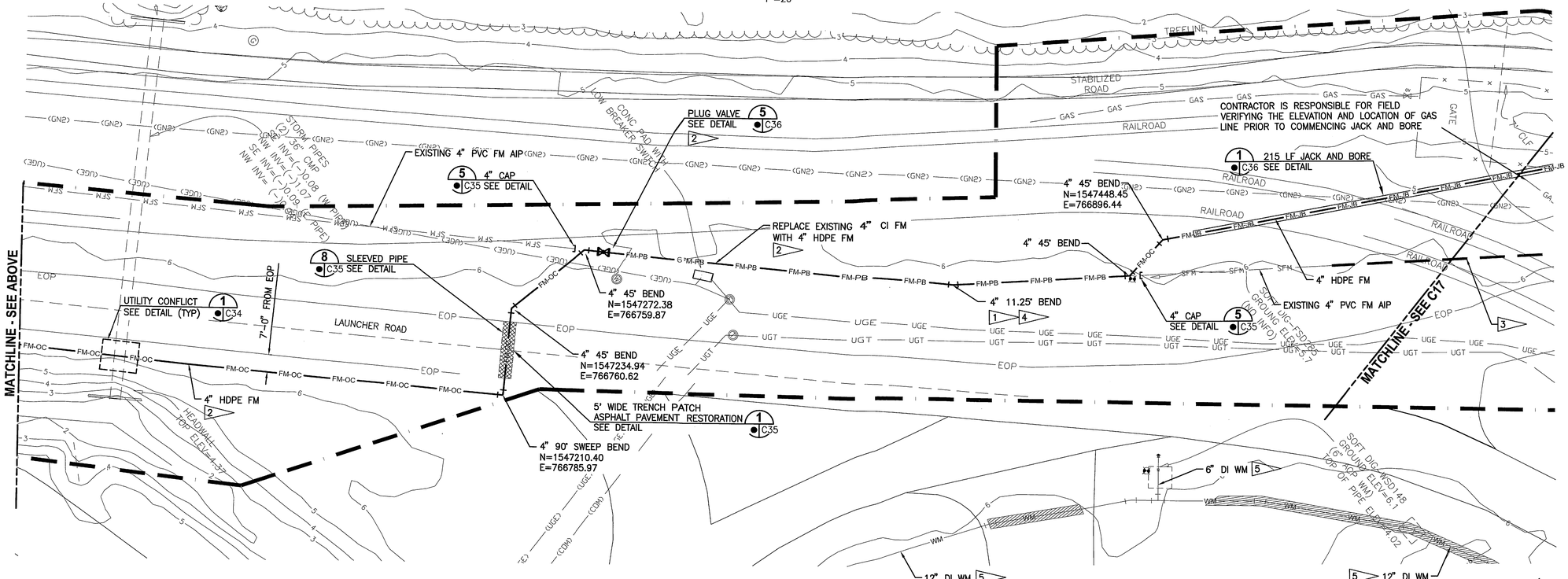
1"=20'



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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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

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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 24	

C16

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

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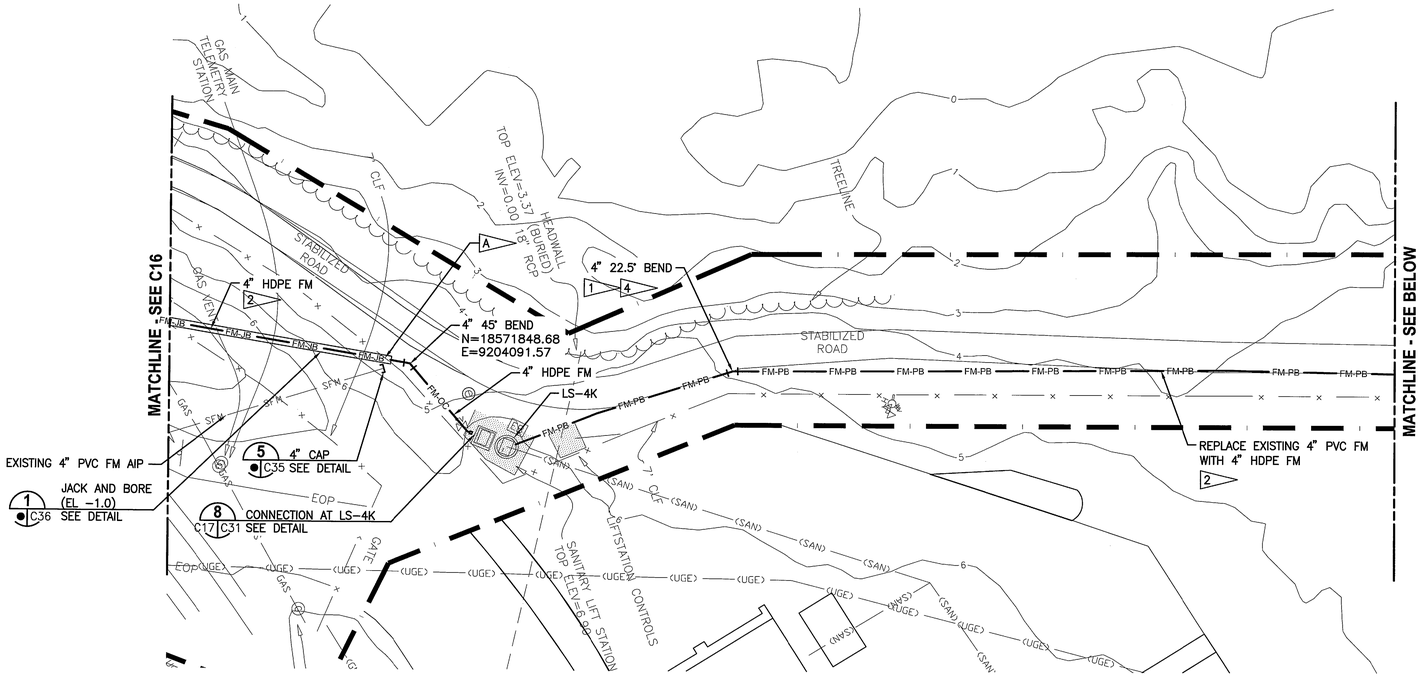
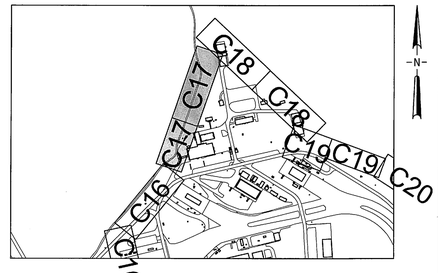


LAUNCHER ROAD PLAN

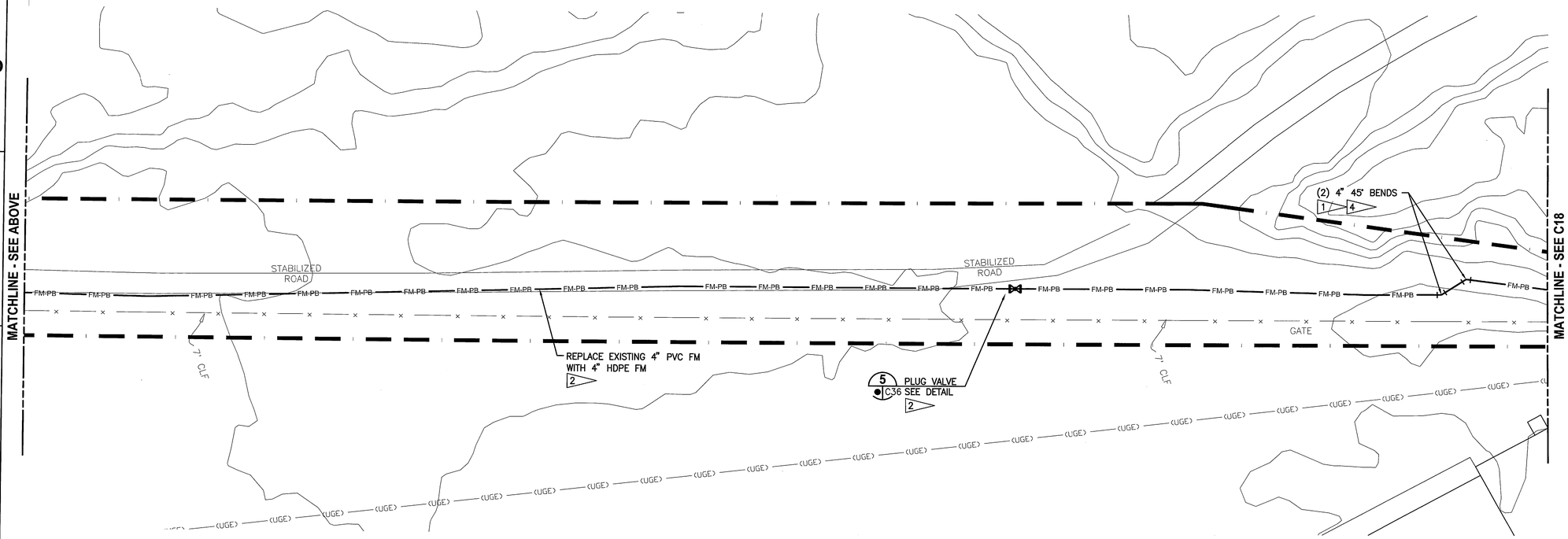
1"=20'



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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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

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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 25

C17

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

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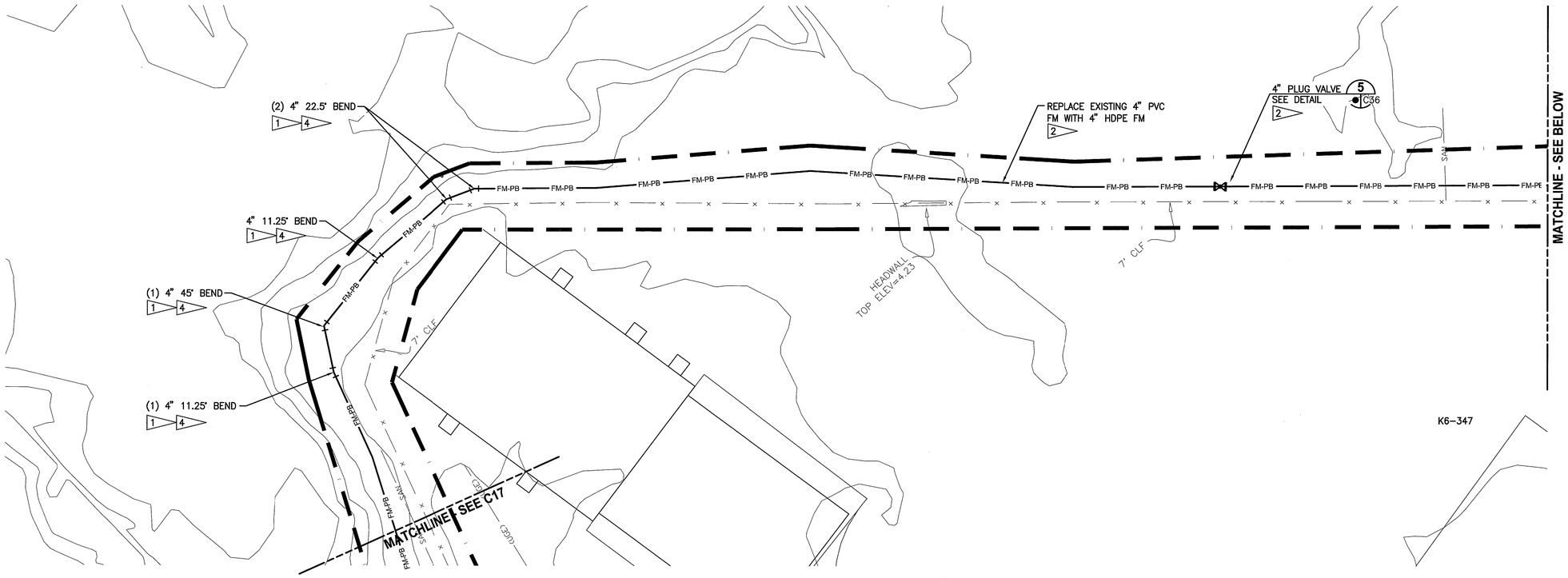
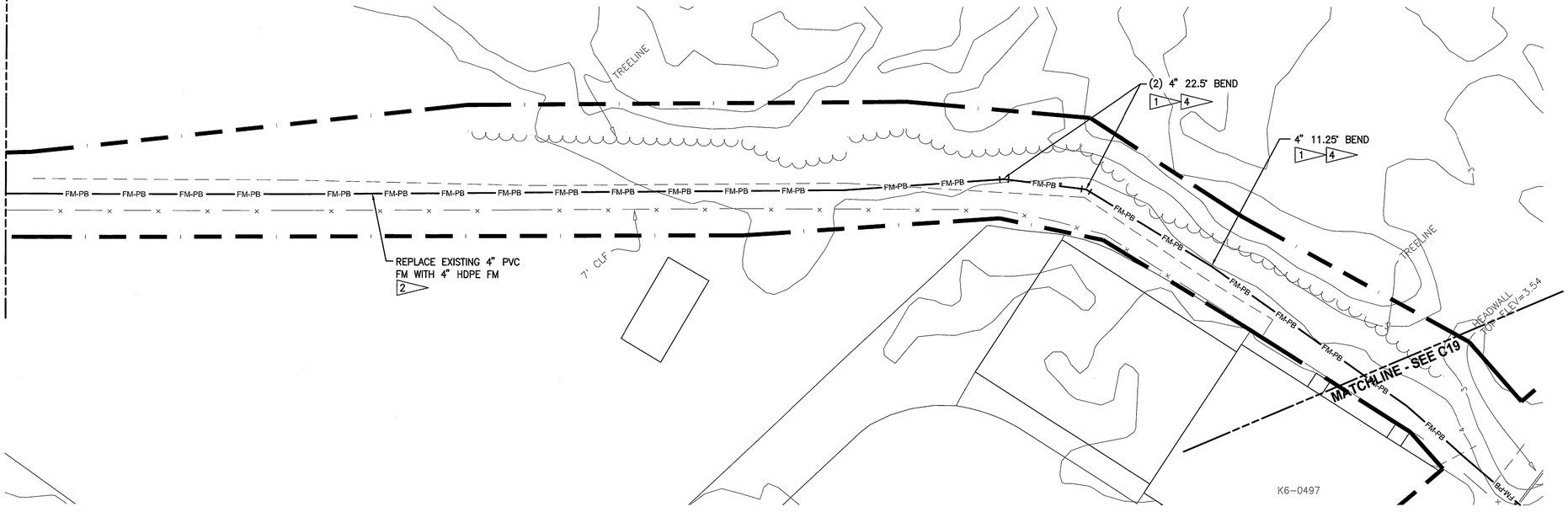


FORCE MAIN PLAN
1"=20'

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	

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SIGNATURES	DATE
DRAWN J. ALLEN	12/05/11
CHECKED M. CLARK	12/05/11
SUBMITTED R. BESI	12/05/11
ST of LICENSURE: FL LICENSE NO: 69875	
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 26	

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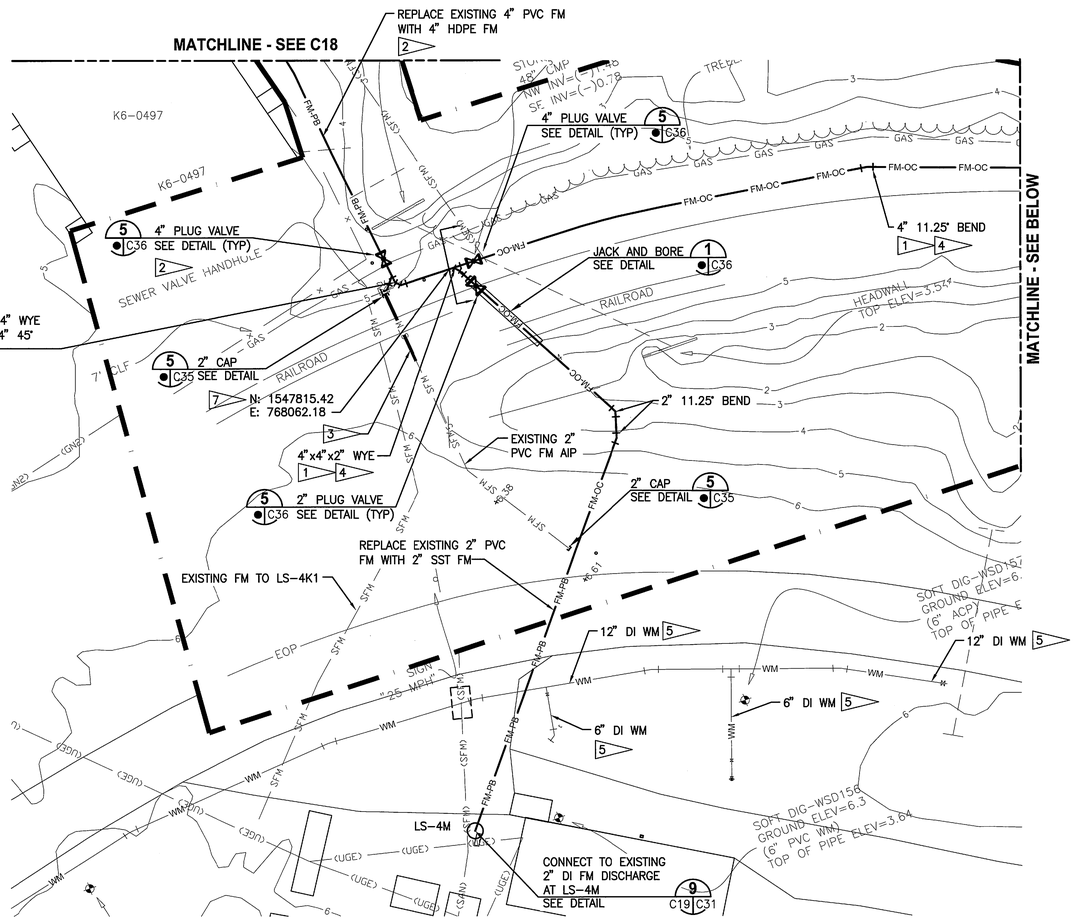
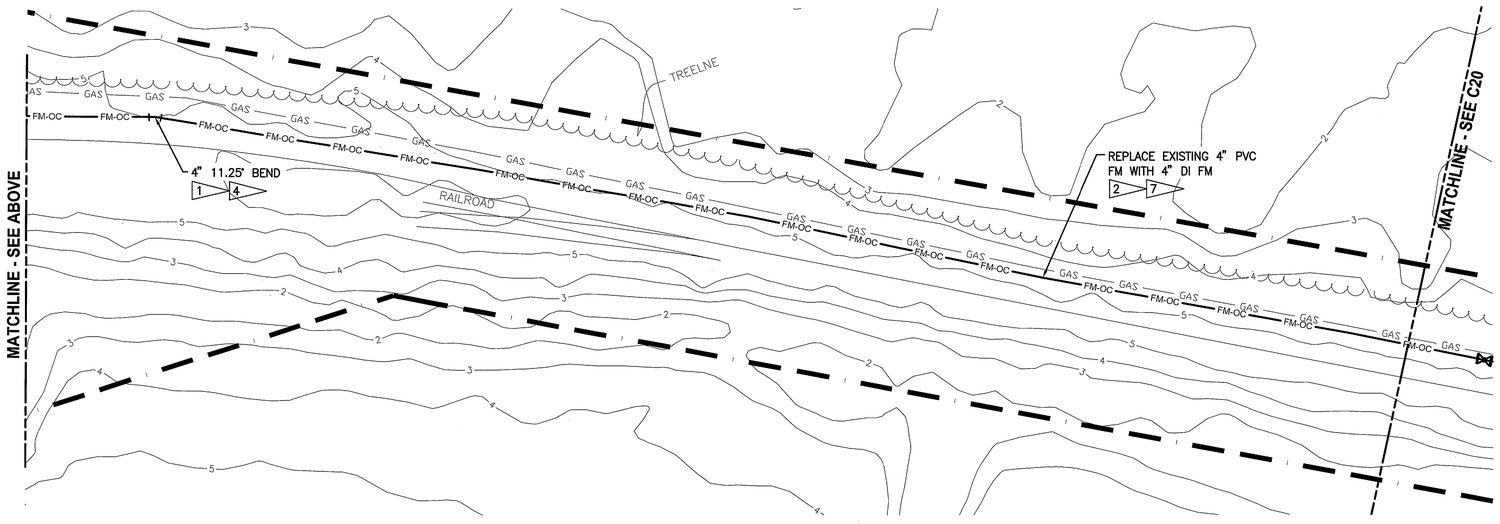
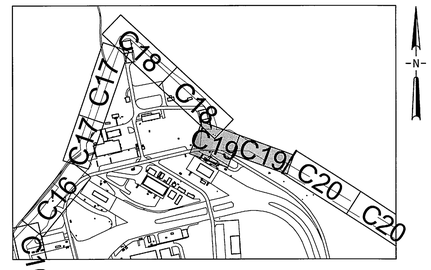


FORCE MAIN PLAN
1"=20'



FORCE MAIN PLAN
1"=20'

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



KEY MAP
NTS

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

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

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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 27

C19

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

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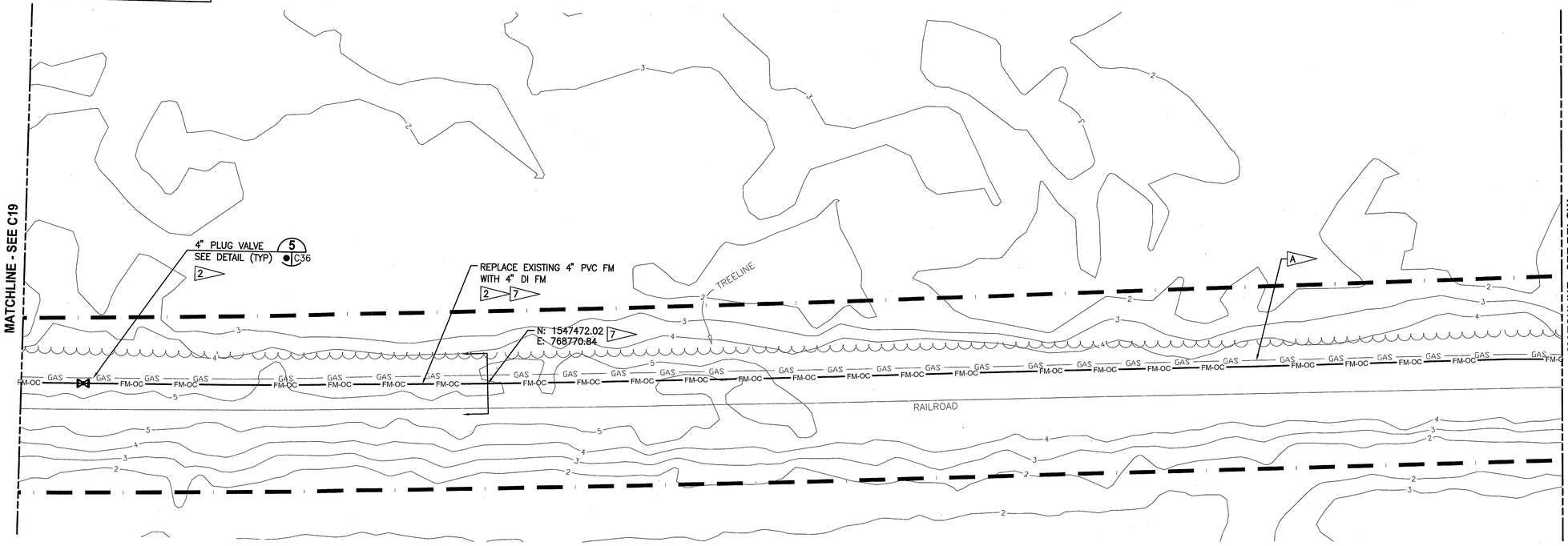
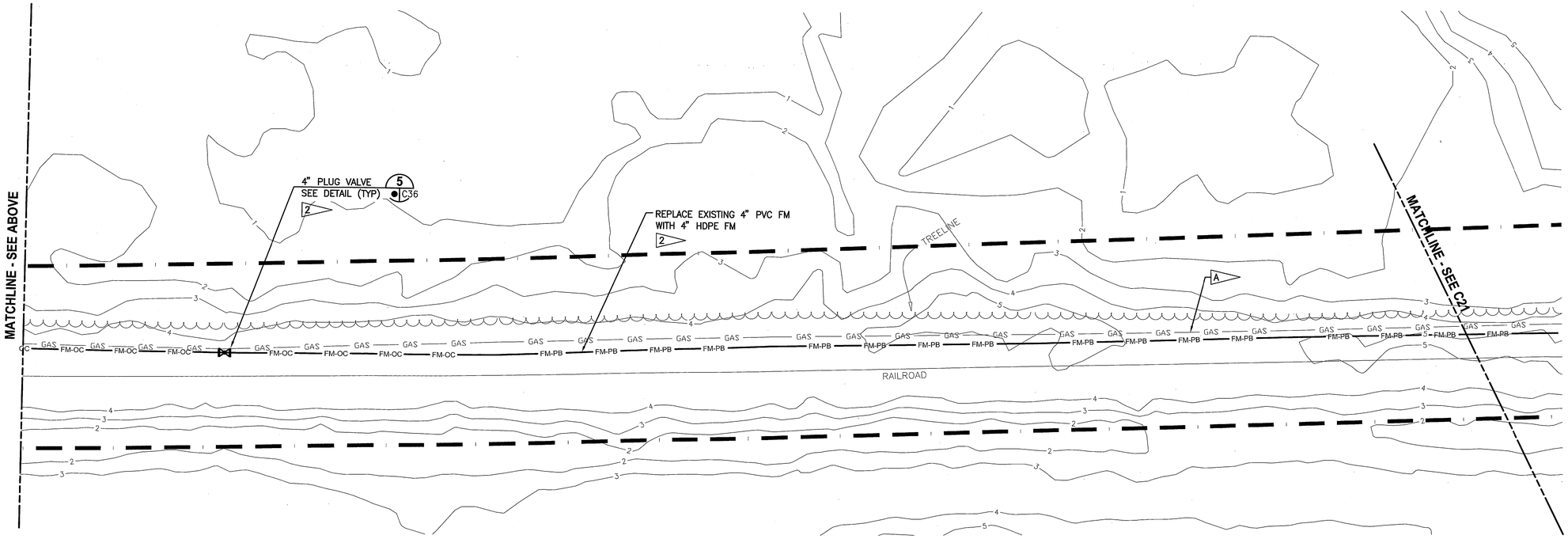
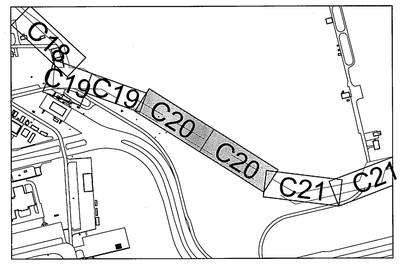


FORCE MAIN PLAN
1"=20'



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

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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 28

C20

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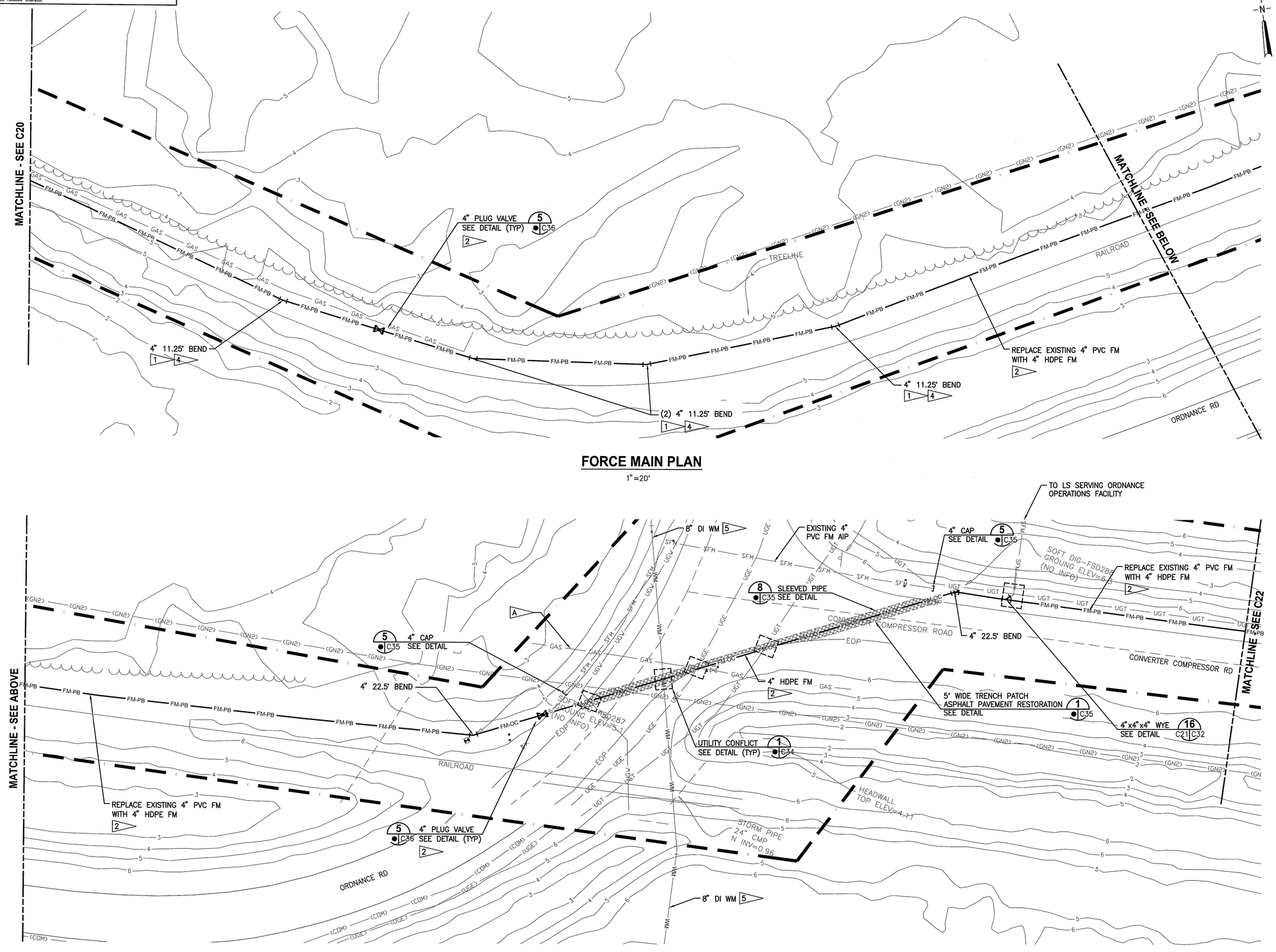
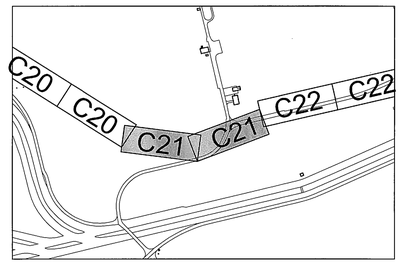


FORCE MAIN PLAN

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

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

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KENNEDY SPACE CENTER, FLORIDA

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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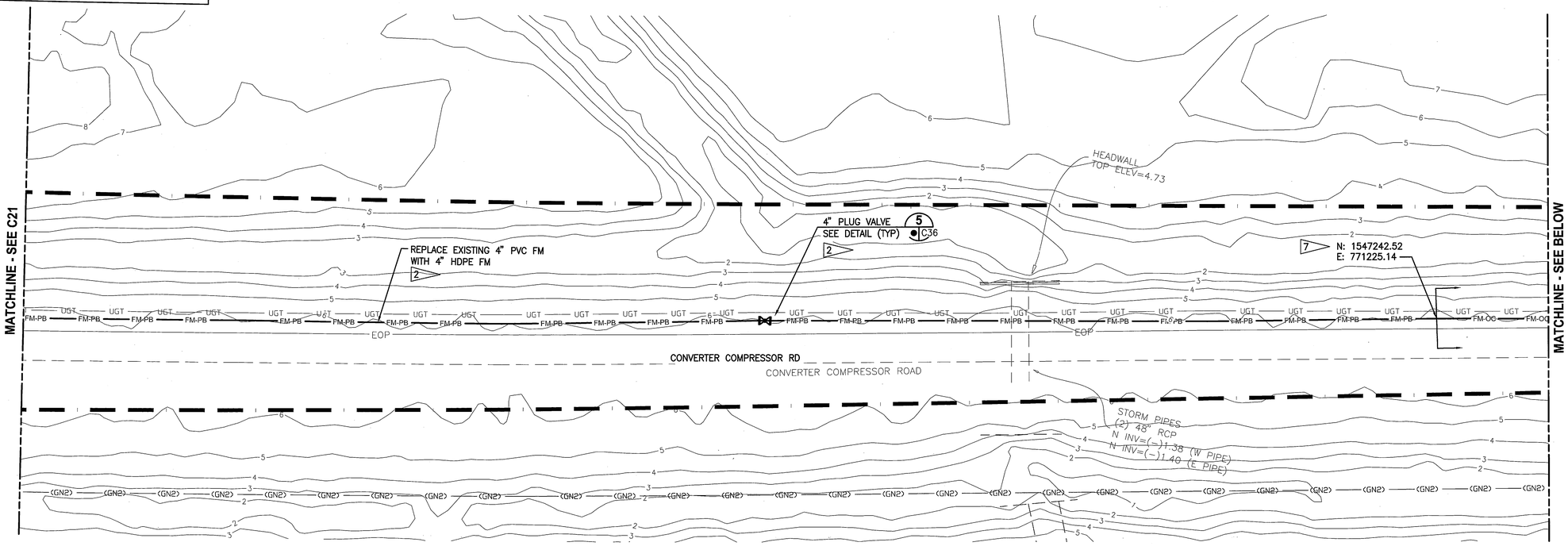
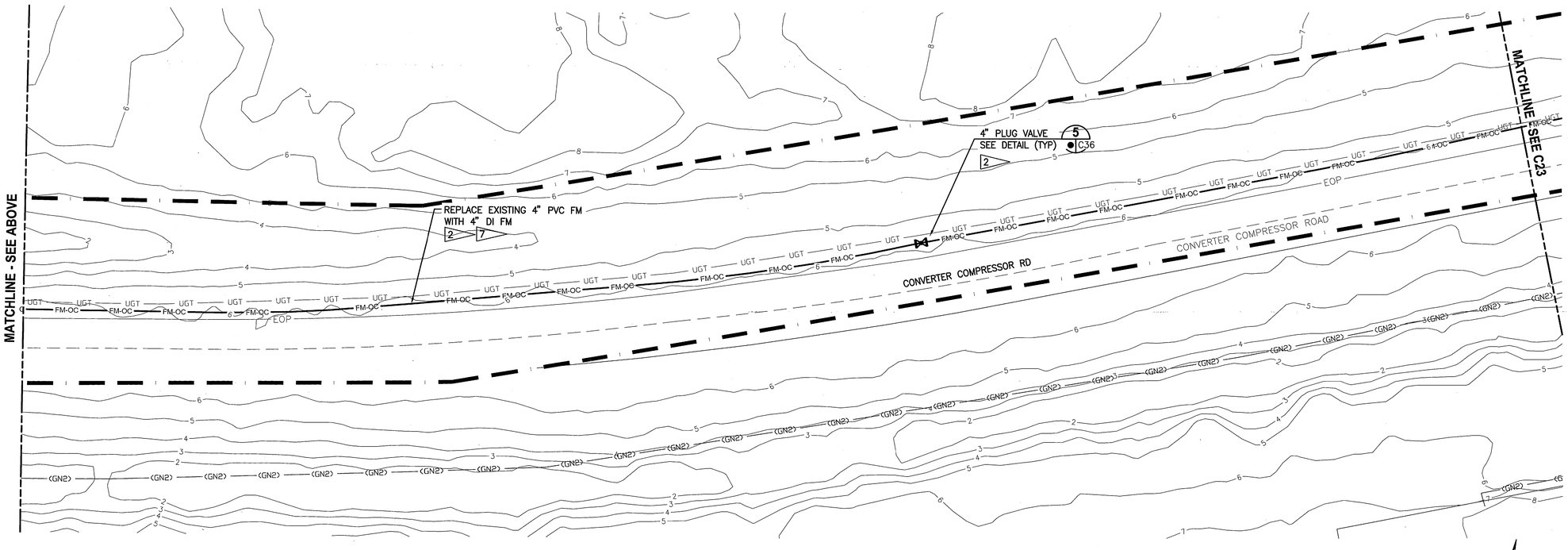


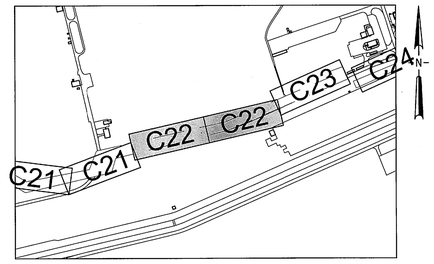
CONVERTER COMPRESSOR ROAD PLAN

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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JONES EDMUNDS
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
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 30

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

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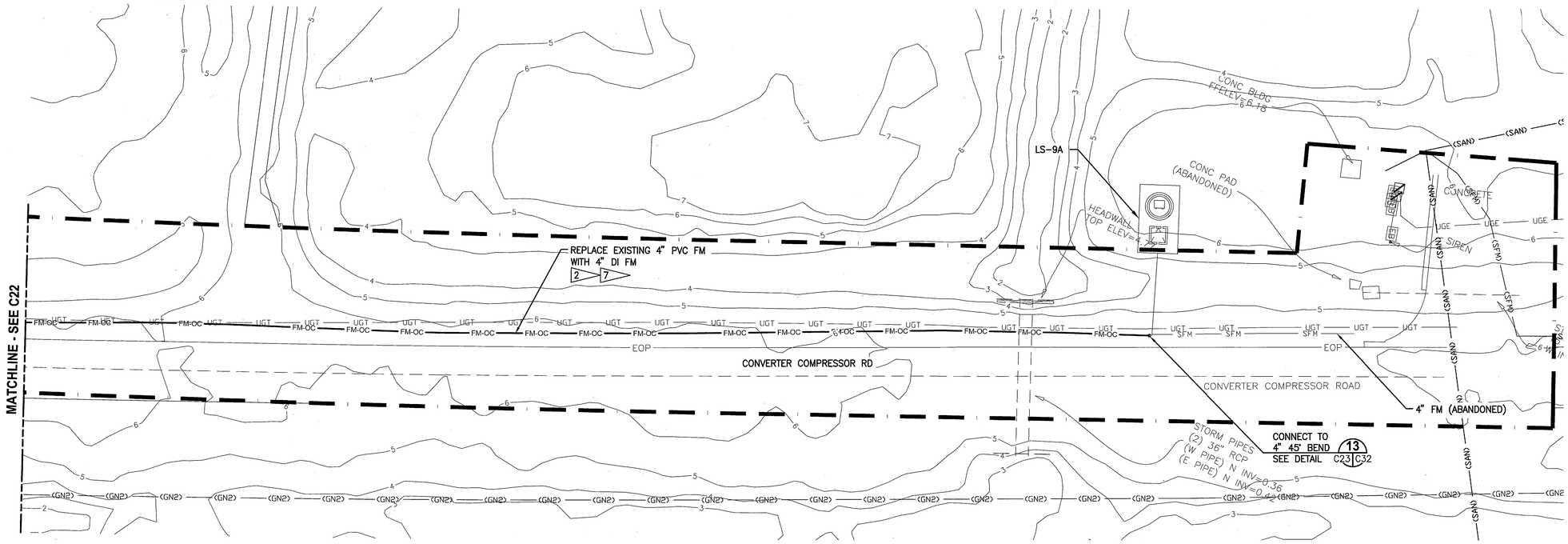
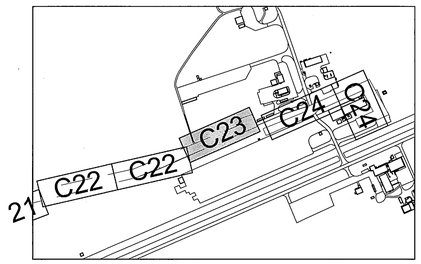


CONVERTER COMPRESSOR ROAD PLAN

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	

REVISIONS

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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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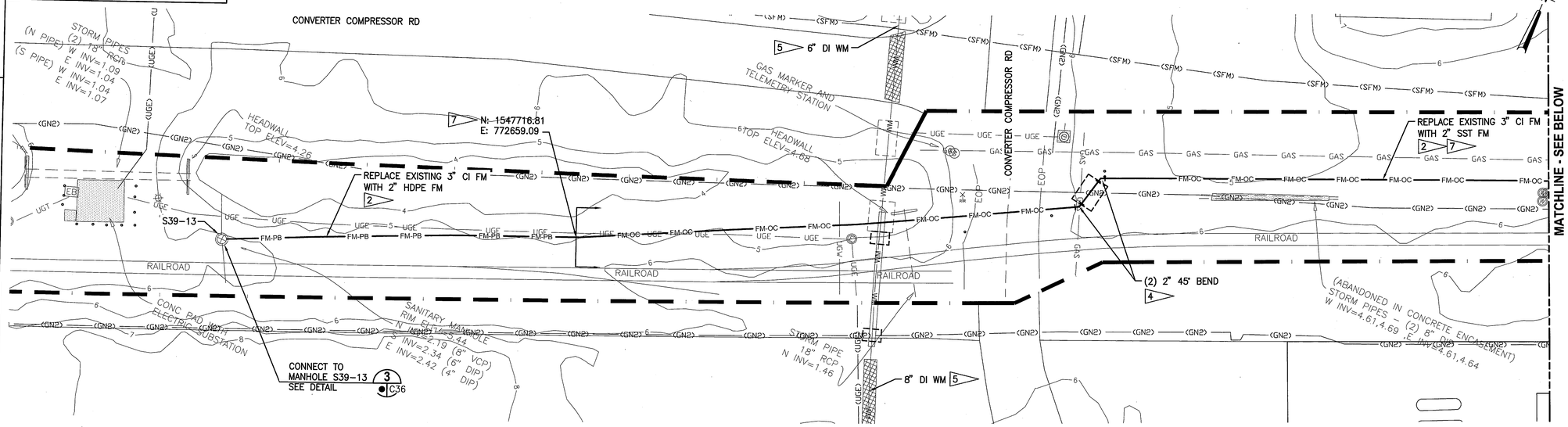
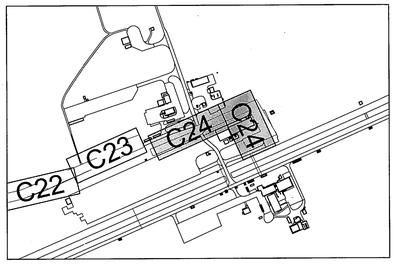


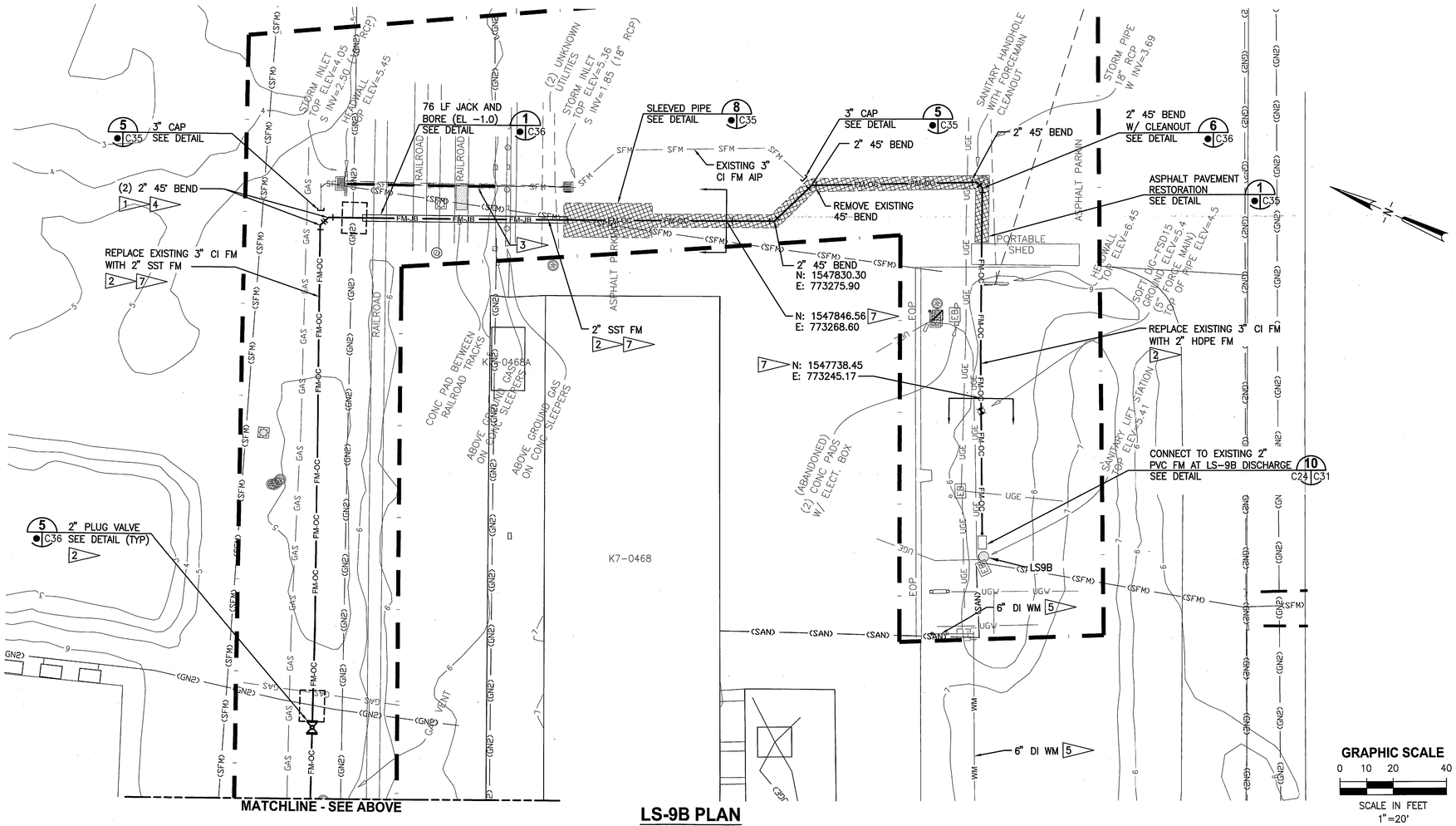
CONVERTER COMPRESSOR ROAD & FLUID SERVICING ROAD PLAN

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	[signature]

REVISIONS

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

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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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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 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

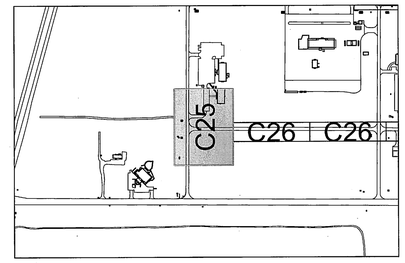
12" DI WM 5

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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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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JOHN F. KENNEDY SPACE CENTER, NASA
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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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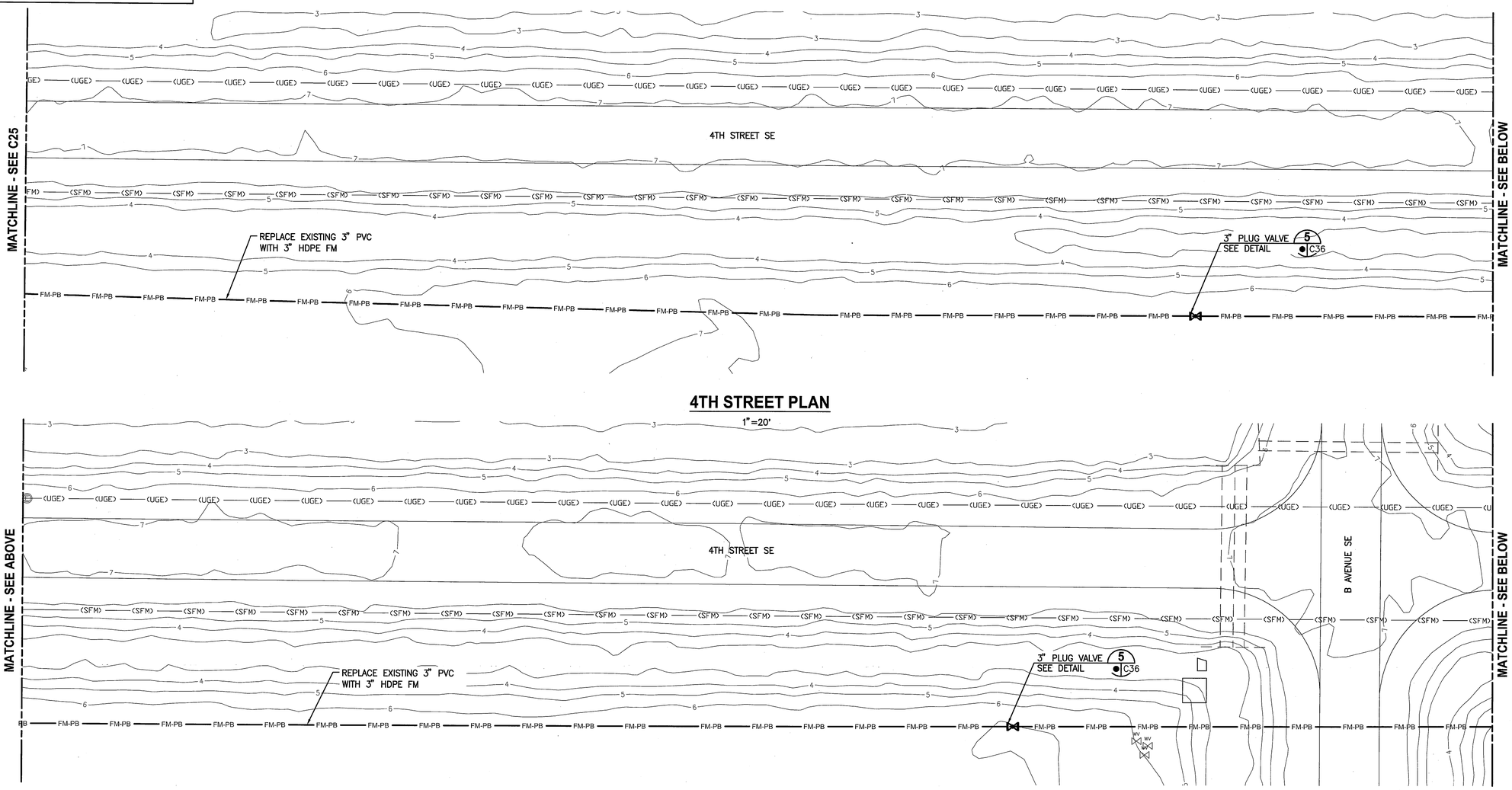
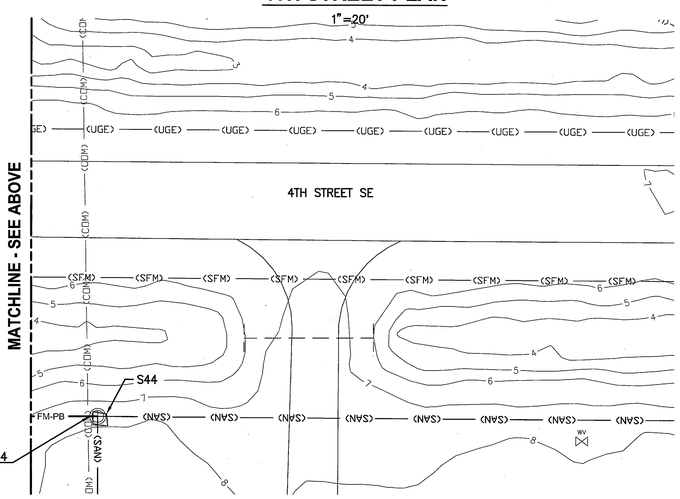
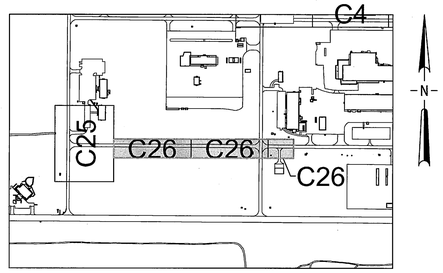


4TH STREET PLAN
1"=20'



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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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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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 34

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MATCHLINE - SEE C28 WEST

2ND ST SE

S9
RIM EL 8.69
IE 3.93

UTILITY CONFLICT
SEE DETAIL (TYP) 1 C34

12" DI WM 5

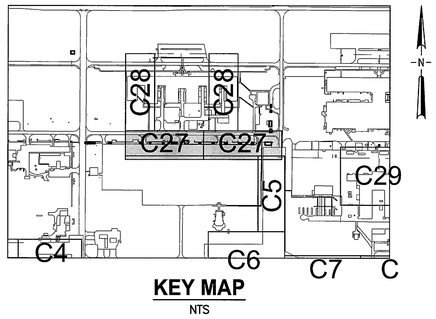
ASPHALT PAVEMENT RESTORATION
SEE DETAIL (TYP) 1 C35

CONCRETE SIDEWALK RESTORATION
SEE DETAIL (TYP) 4 C35

REPLACE EXISTING 8" PVC GRAVITY SEWER WITH 8" PVC GRAVITY SEWER

MATCHLINE - SEE BELOW

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.

MATCHLINE - SEE C28 EAST

S8
RIM EL 8.53
IE 2.29

S7
RIM EL 7.05
IE 0.13

S6

PRECAST CONCRETE MANHOLE
SEE DETAIL (TYP) 1 C37

REPLACE EXISTING 8" GRAVITY SEWER WITH 8" PVC GRAVITY SEWER

12" DI WM 5

REPLACE EXISTING 8" PVC GRAVITY SEWER WITH 8" PVC GRAVITY SEWER

8" DI WM 5

8" DI WM 5

MATCHLINE - SEE ABOVE

MATCHLINE - SEE C5

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
A		GENERAL REVISIONS	12/05/11	

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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

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KENNEDY SPACE CENTER, FLORIDA

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	A
PROJ. NO. 96968.3		SHEET 35	

C27

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

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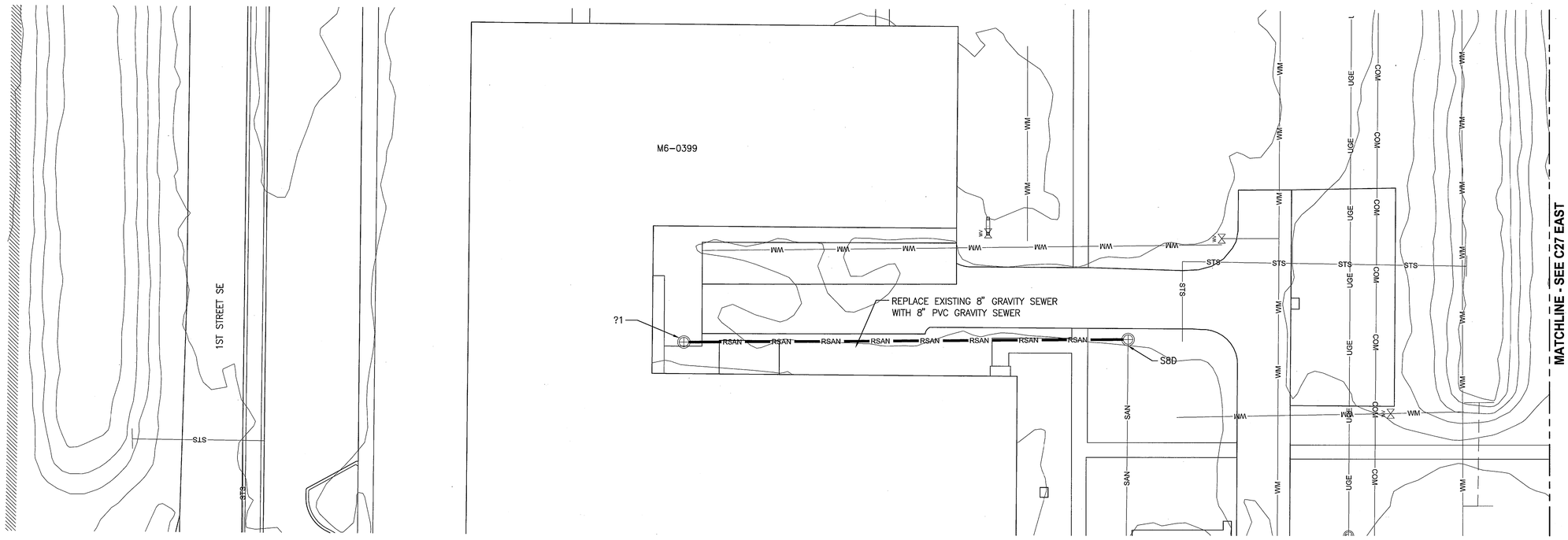
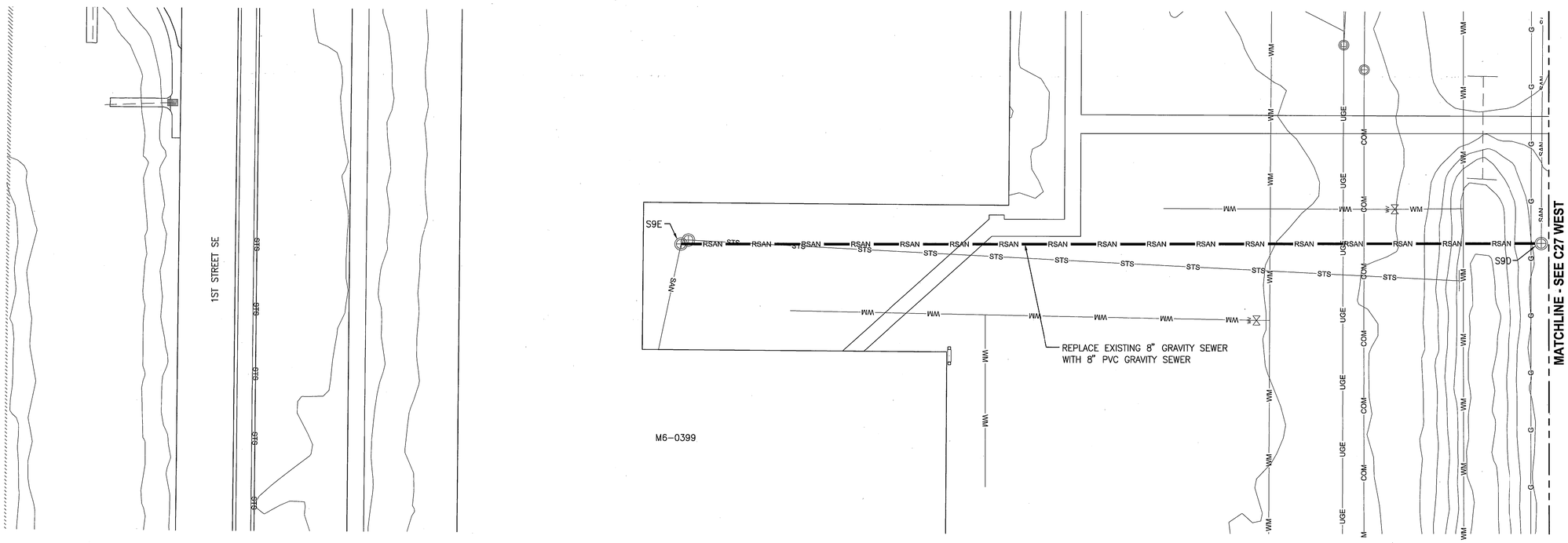


EAST PLAN
1"=20'

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	

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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 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

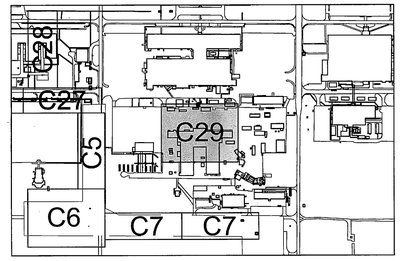
S11B

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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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 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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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 38

C30

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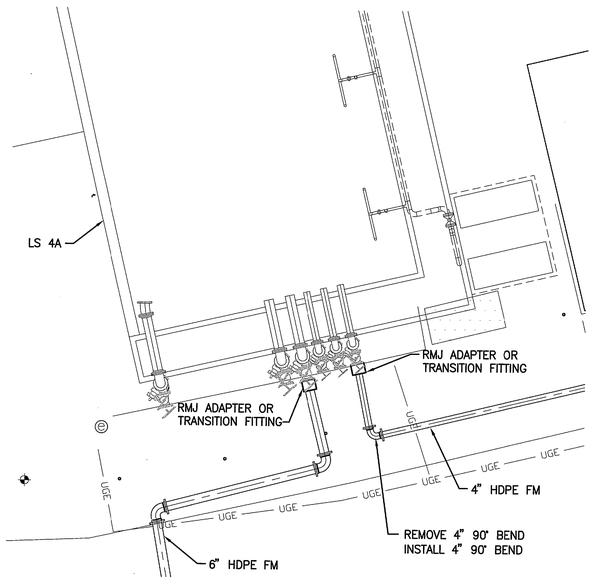
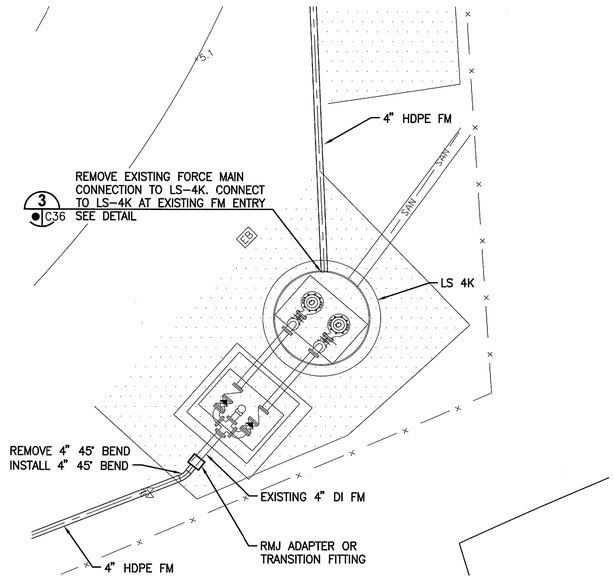
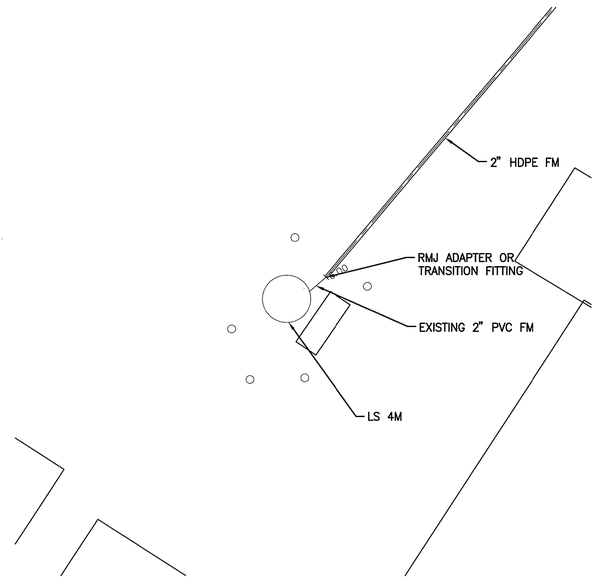


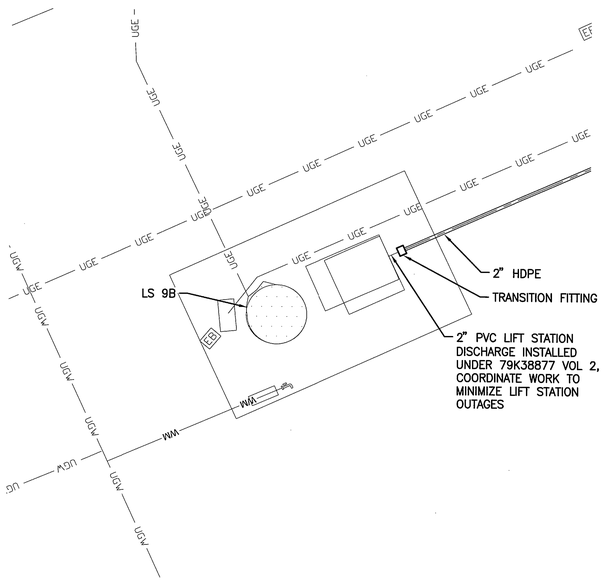
CONNECTION DETAIL 7
1/4"=1'-0" C15 | C31



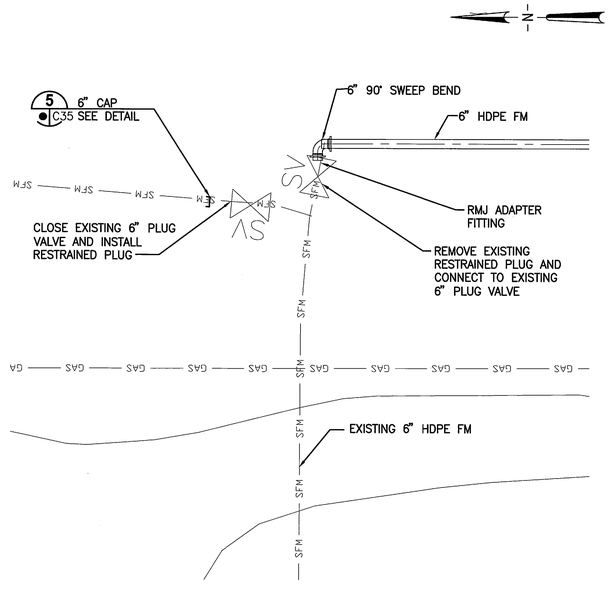
CONNECTION DETAIL 8
1/4"=1'-0" C17 | C31



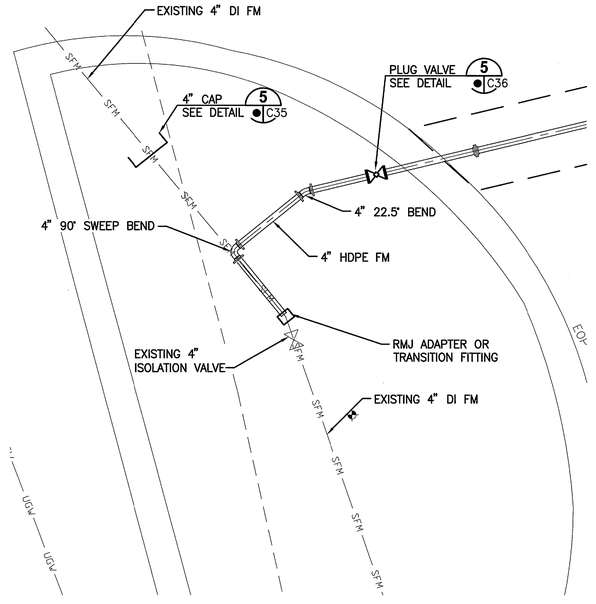
CONNECTION DETAIL 9
1/4"=1'-0" C19 | C31



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"

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SYM	ZONE	DESCRIPTION	DATE	APPROVED
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	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
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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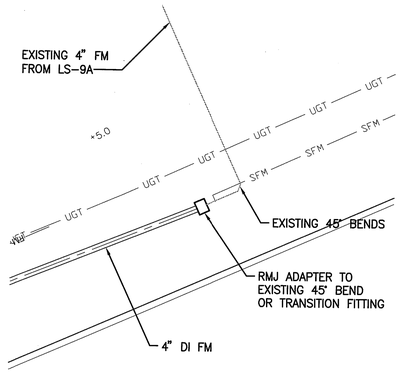
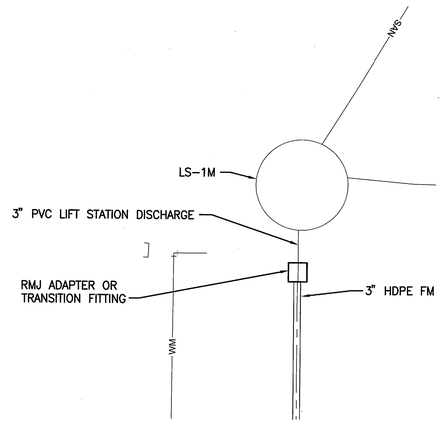
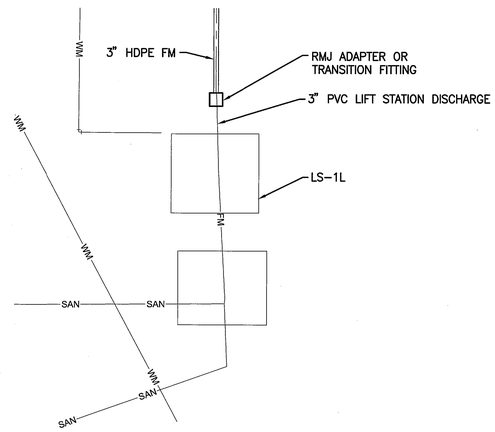


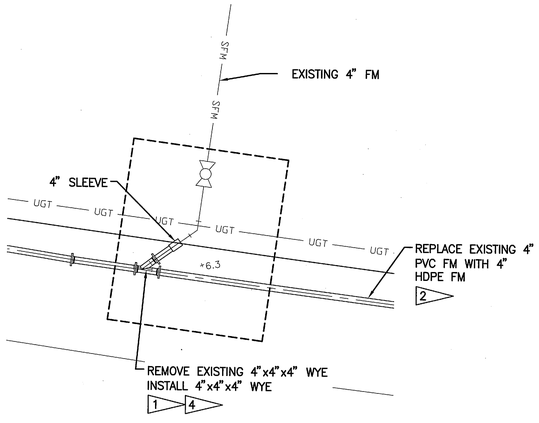
CONNECTION DETAIL 13
1/4"=1'-0" C23 C32



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



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



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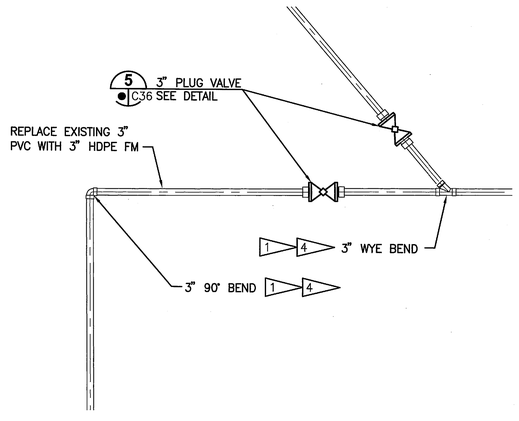

CONNECTION DETAIL 17
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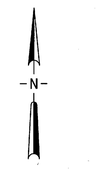

GRAPHIC SCALE
0 1 2 4 8
SCALE IN FEET
1/4"=1'-0"

THIS SPACE RESERVED

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

REVISIONS

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
JOHN F. KENNEDY SPACE CENTER, NASA
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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 40

C32

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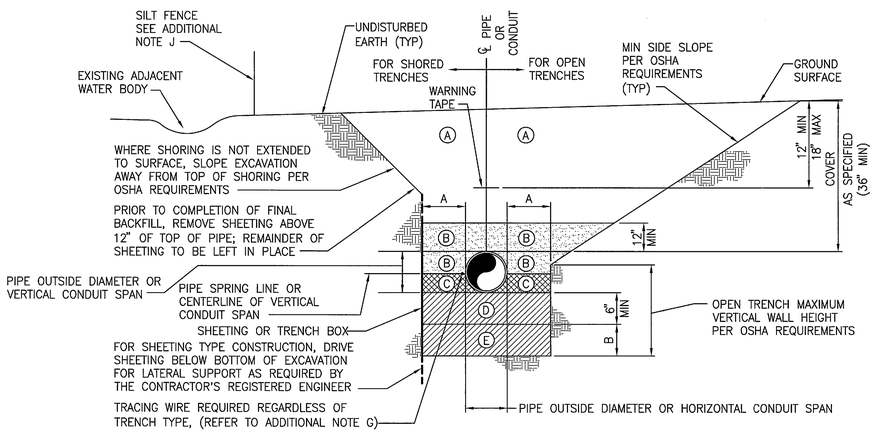


NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE	ADDITIONAL EXCAVATION DEPTH (1)
	A (INCHES)	B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(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:

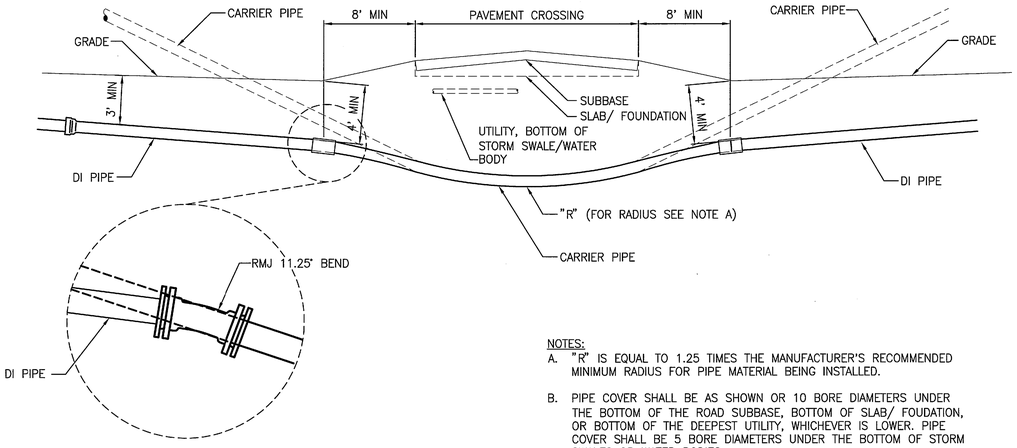
F. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLAB, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS.

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.

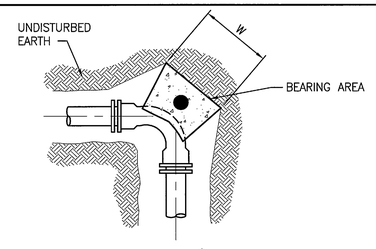
TYPICAL UTILITY TRENCH DETAIL 1
NTS C33



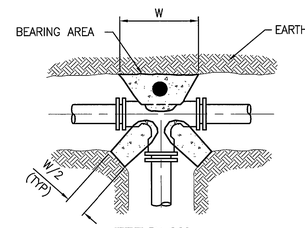
CONNECTION DETAIL (TYP BOTH SIDES)

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.

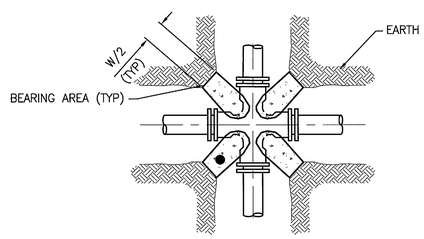
TYPICAL HORIZONTAL DIRECTIONAL DRILL DETAIL 2
NTS C14 C33



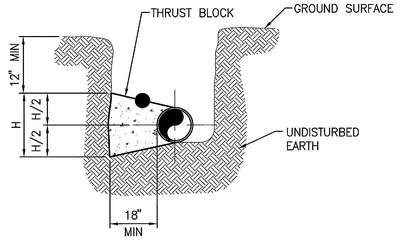
BENDS PLAN



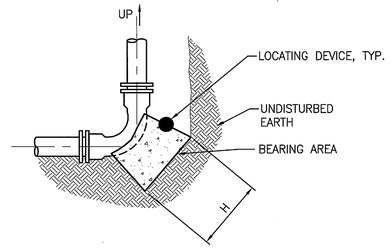
TEE PLAN



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	21x21	28x28	33x33
6	15x15	22x22	30x30	41x41	48x48
8	19x19	26x26	36x36	49x49	59x59
10	22x22	30x30	42x42	57x57	68x68
12	24x24	34x34	47x47	64x64	76x76
14	27x27	37x37	52x52	70x70	84x84
16	29x29	40x40	56x56	76x76	91x91
24	36x36	51x51	71x71	97x97	115x115

REACTION BLOCK NOTES

A. BASED ON 100 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. 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

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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	A
PROJ. NO. 96968.3		SHEET 41	

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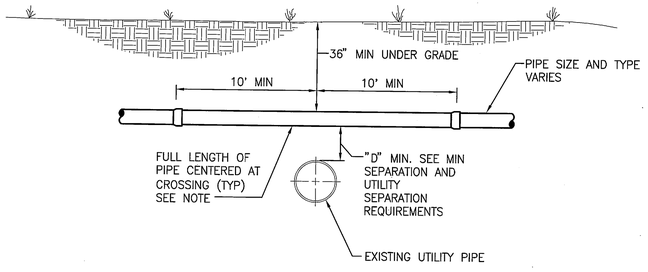
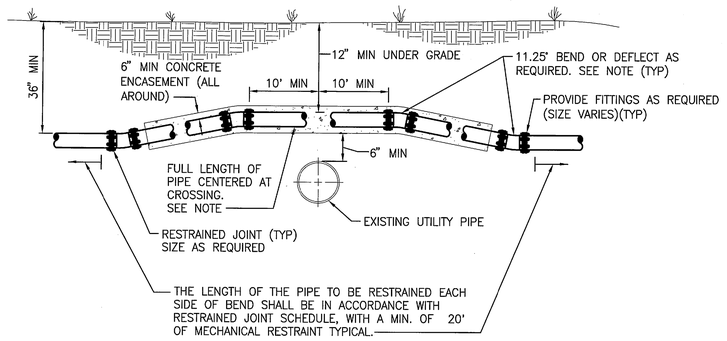
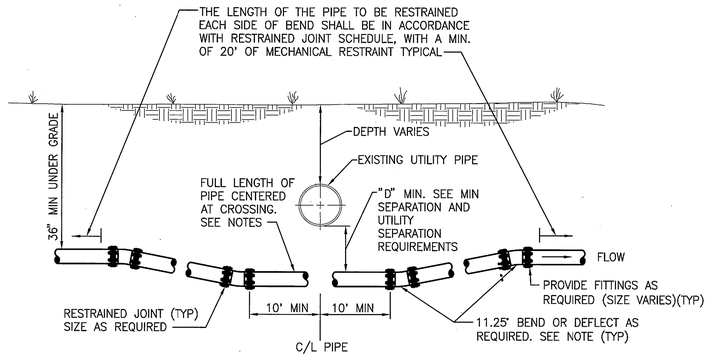


CROSSING OVER UTILITIES



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).

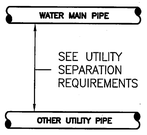
D. NEW, RELOCATED OR EXISTING UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY OR VACUUM–TYPE SANITARY SEWER, OR STORM SEWER SHALL BE LOCATED SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX (6) INCHES, AND PREFERABLE TWELVE (12) INCHES, ABOVE OR AT LEAST TWELVE (12) INCHES BELOW THE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

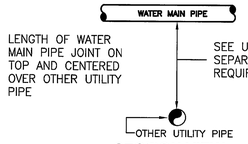
H. IF THE CONTRACTOR CAN NOT MEET THE MINIMUM SEPARATION REQUIREMENTS HE/SHE MUST NOTIFY THE CONTRACTING OFFICER. THE CONTRACTING OFFICER IS REQUIRED TO DISCUSS MITIGATION WITH FDEP AND OBTAIN FDEP APPROVAL PRIOR TO INSTALLING ANY UTILITIES NOT IN COMPLIANCE WITH FDEP MINIMUM SEPARATION REQUIREMENTS.



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

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

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

NTS

1 / C34

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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
CIVIL DETAILS

FILE NO.	SIZE	DWG. NO.	REV
	F	79K38877 VOL 3	A
PROJ. NO. 96968.3		SHEET 42	

C34

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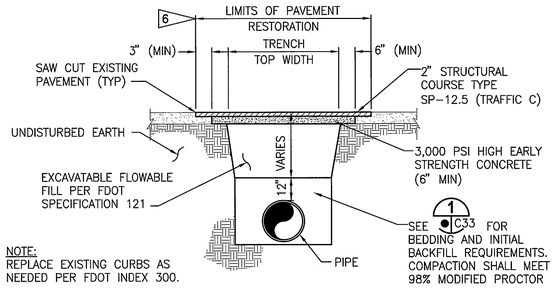
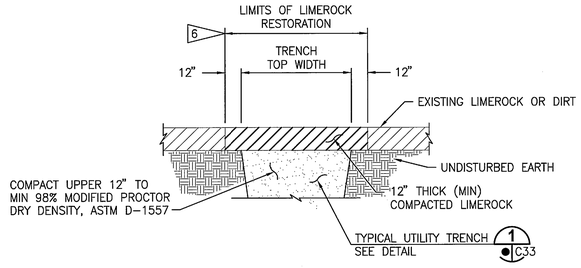
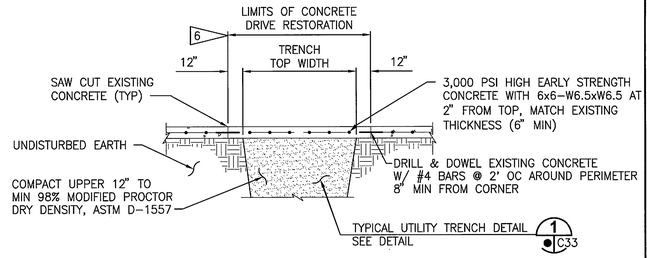


NOTE:
REPLACE EXISTING CURBS AS NEEDED PER FDOT INDEX 300.

ASPHALT PAVEMENT RESTORATION DETAIL 1 C35
NTS

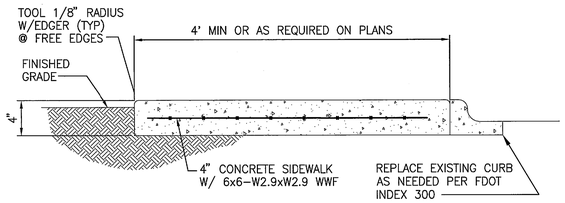


LIMEROCK RESTORATION DETAIL 2 C35
NTS



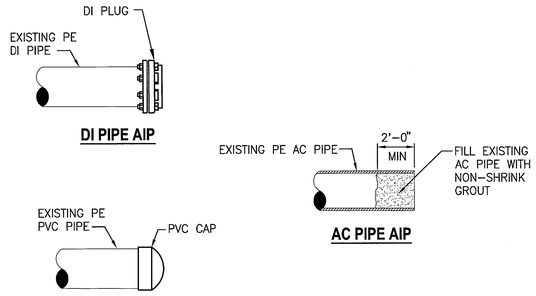
NOTES:
A. DRILL AND DOWEL 1 LOCATION EACH SIDE FOR CURB REPAIR.
B. MATCH EXISTING GRADE AND FINISH.
C. REPLACE EXISTING CURBS AS NEEDED PER FDOT INDEX 300.
D. WATER TO CEMENT RATIO SHALL NOT EXCEED 0.45
E. PLACE CONTRACTION JOINTS @12' OC (MAX)
F. CONCRETE SHALL BE CURED MOIST, BY SPRAYING OR FOGGING,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

CONCRETE RESTORATION DETAIL 3 C35
NTS

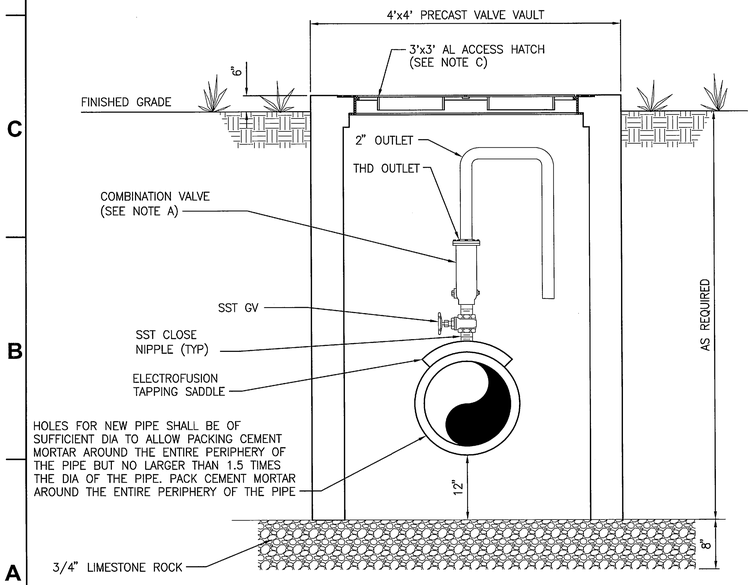


NOTES:
A. TOOL JOINTS SHALL BE LOCATED 5' APART ALONG THE LENGTH OF THE SIDEWALK.
B. CONTROL JOINTS SHALL BE LOCATED AT 10' SPACING ALONG THE LENGTH OF THE SIDEWALK. CONTROL JOINTS SHALL INCLUDE THE CONSTRUCTION OF 1/2" WIDE EXPANSION JOINT MATERIAL FOR THE DEPTH AND WIDTH OF THE SIDEWALK.
C. MATCH EXISTING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

CONCRETE SIDEWALK RESTORATION DETAIL 4 C35
NTS

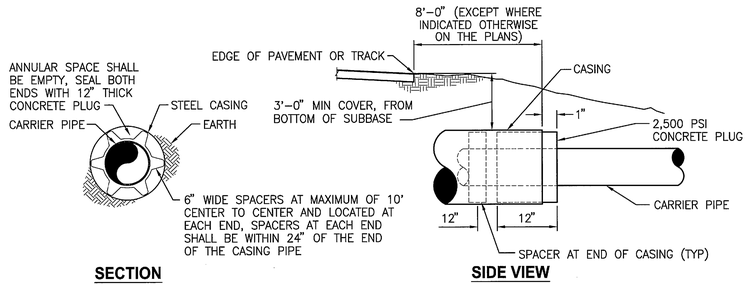


CAP DETAIL 5 C35
NTS



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 C35
NTS



SECTION — SIDE VIEW

CARRIER PIPE NOMINAL DIAMETER	CASING DIA	CASING 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 C35
NTS

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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
CIVIL DETAILS

FILE NO.	SIZE	DWG. NO.	REV
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PROJ. NO. 96968.3		SHEET 43	

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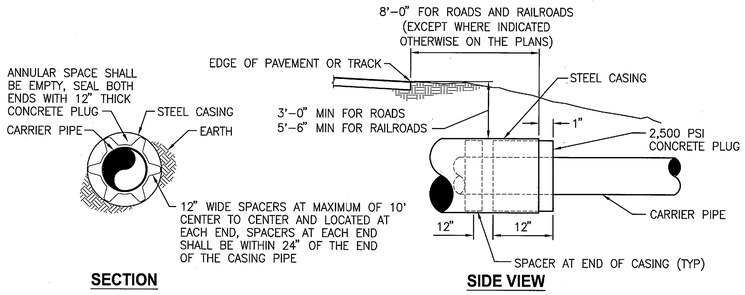


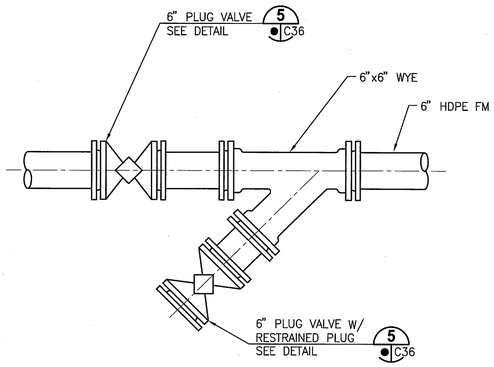
CARRIER PIPE NOMINAL DIAMETER	RAILROAD CASING DIA	RAILROAD CASING MIN WALL THICKNESS
2"–3"	6"	0.375"
4"	8"	0.375"
6"	12"	0.375"

NOTES:

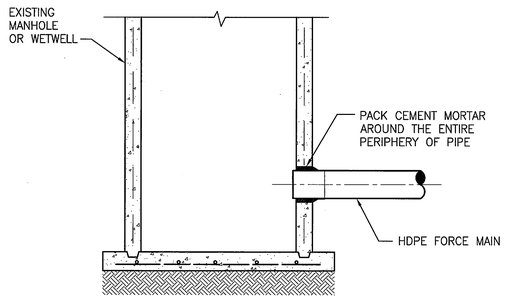
A. ALL HDPE CARRIER PIPE SHALL BE JOINTED BY BUTT FUSION.

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
NTS

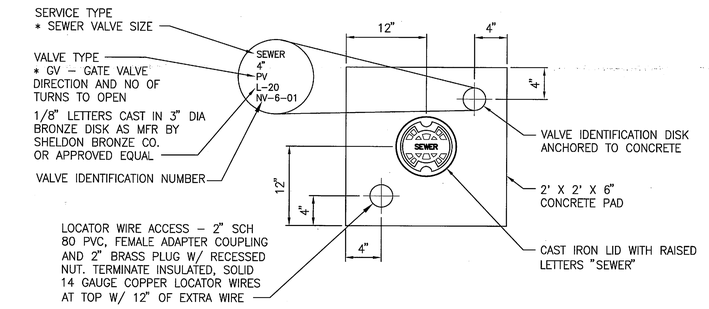


STUB-OUT FOR FUTURE CONNECTION DETAIL 2
NTS C6 C36

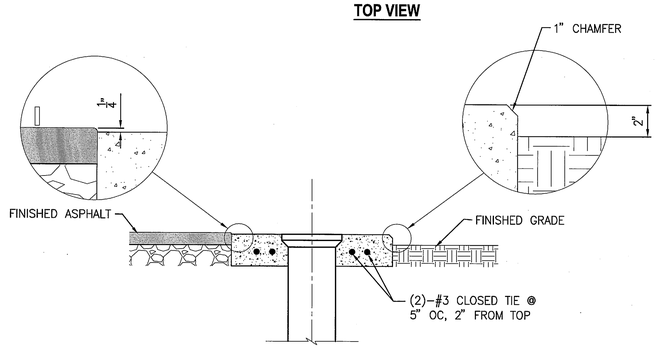


NOTE:
IF THERE IS NOT AN EXISTING OPENING THEN HOLES FOR NEW PIPE SHALL BE CENTERED ON THE STRUCTURE AND BE OF SUFFICIENT DIA TO ALLOW PACKING CEMENT MORTAR AROUND THE ENTIRE PERIPHERY OF THE PIPE BUT NO LARGER THAN 1.5 TIMES THE DIA OF THE PIPE. CUTTING THE STRUCTURE SHALL BE DONE IN A MANNER THAT WILL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

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

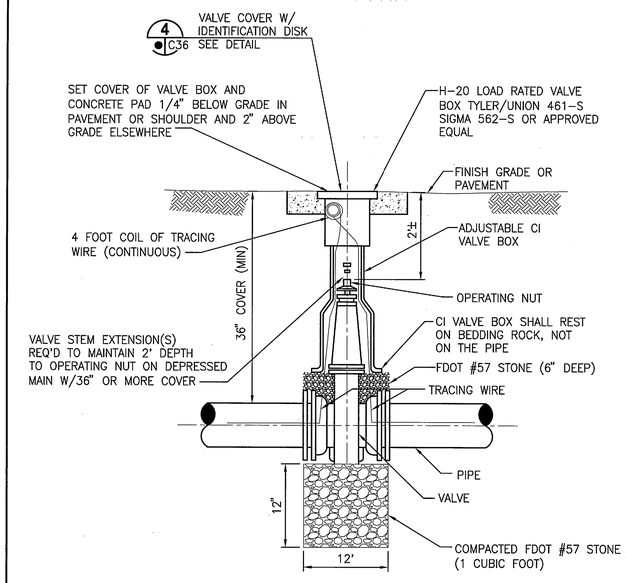


TOP VIEW

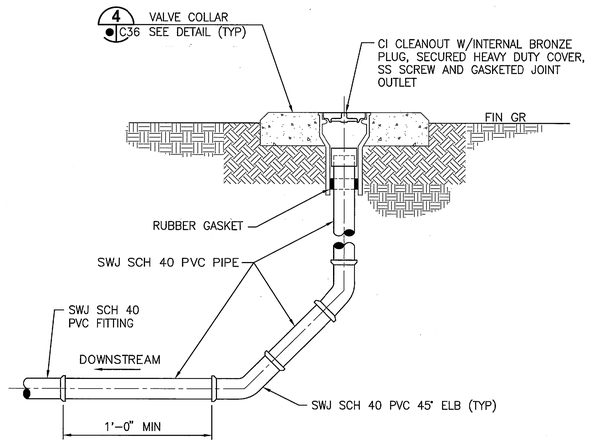


NOTE:
PROVIDE EMBOSSED SS TAG SECURED TO VALVE BODY W/ SS AIRCRAFT CABLE CONTAINING DUPLICATE INFORMATION SHOWN ON IDENTIFICATION DISC.

VALVE COLLAR AND IDENTIFICATION DISK DETAIL 4
NTS C36



BURIED PLUG VALVE AND BOX DETAIL 5
NTS C36



SECTION

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

CLEANOUT DETAIL 6
NTS C36

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

FILE NO.	SIZE	DWG. NO.	REV
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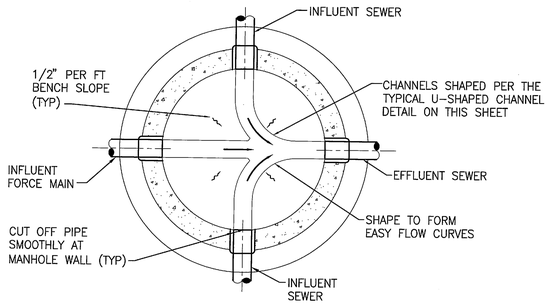
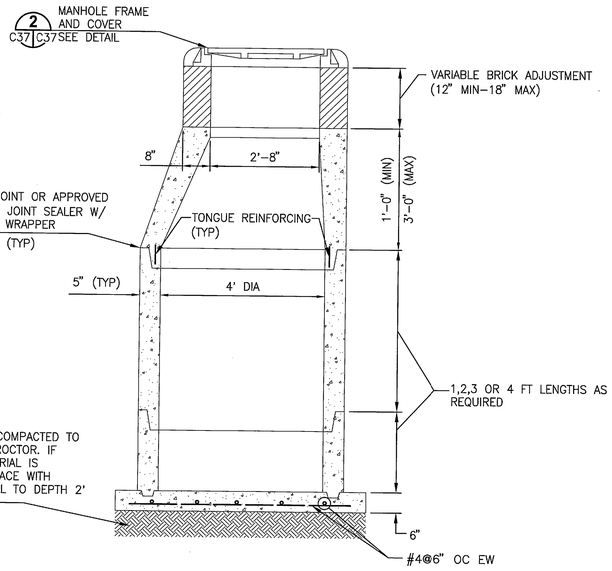


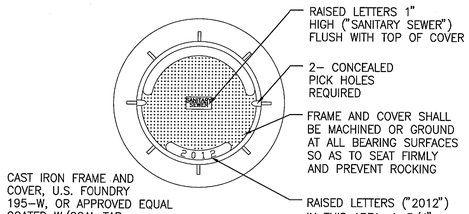
PLAN



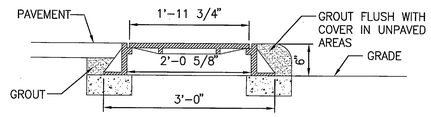
SECTION

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
NTS C37

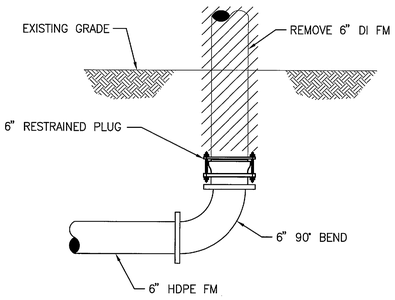


PLAN

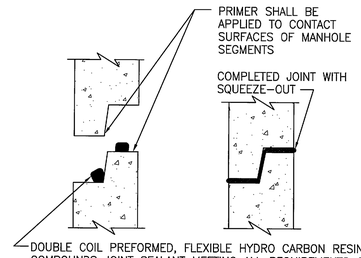


SECTION

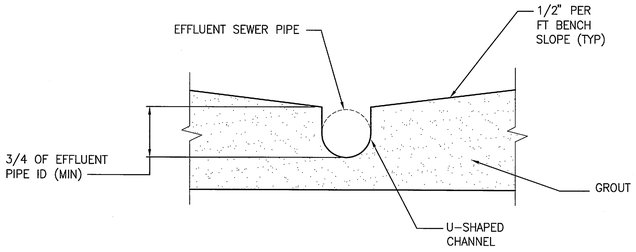
MANHOLE FRAME AND COVER DETAIL 2
NTS C37 C37



TYPICAL FORCEMAIN REMOVAL DETAIL 4
NTS C2 C37



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



TYPICAL U-SHAPED CHANNEL DETAIL 5
NTS C37

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

FILE NO.	SIZE	DWG. NO.	REV
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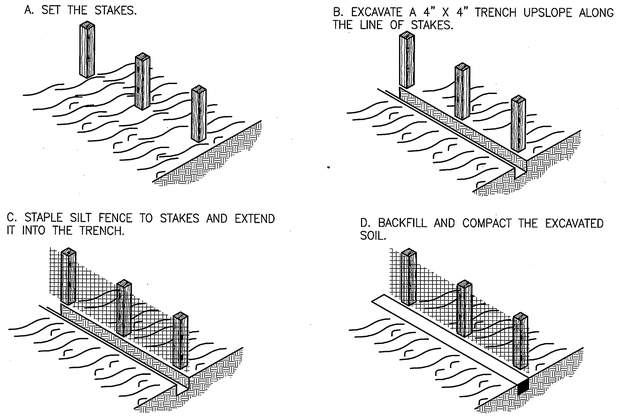
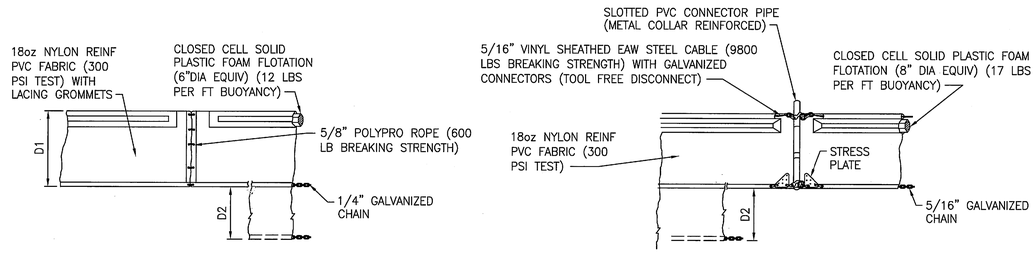


CONSTRUCTION OF A SILT FENCE DETAIL 1
NTS — C38

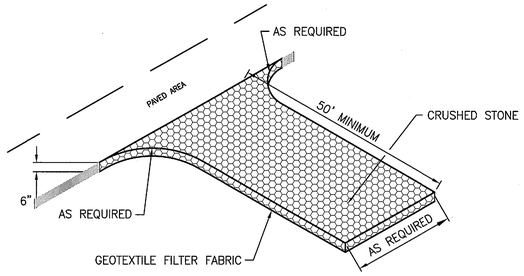


D1 =5' STD (SINGLE PANEL FOR DEPTHS 5' OR LESS)
D2 =5' STD (ADDITIONAL PANEL FOR DEPTHS 5')

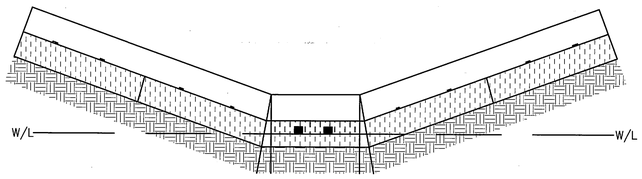
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET. TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALL FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER.

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.

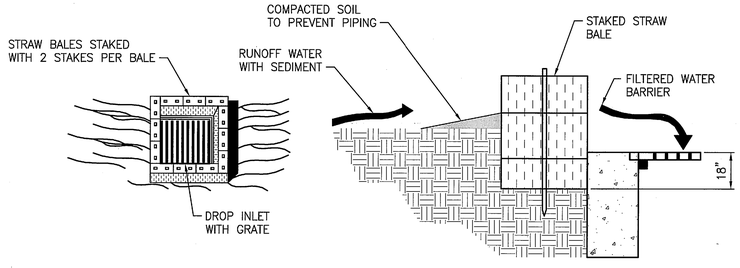
TYPICAL FLOATING TURBIDITY BARRIER DETAIL 2
NTS — C38



STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL 3
NTS — C38

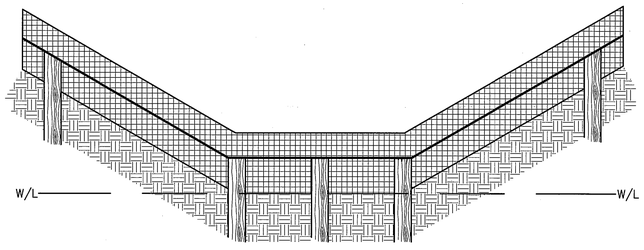


PROPER PLACEMENT OF A STRAW BALE IN A DRAINAGE WAY DETAIL 4
NTS — C38

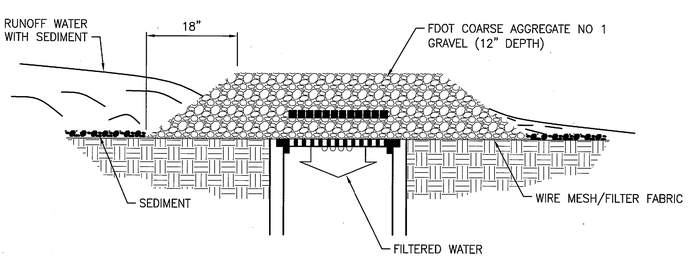


SPECIFIC APPLICATION
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5%) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 5.3 CFS) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY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

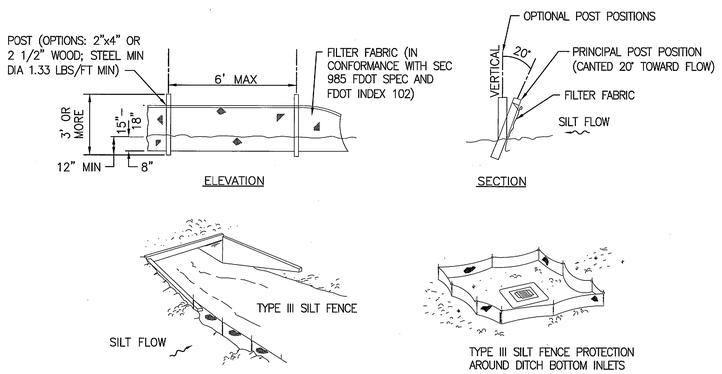
STRAW BALE DROP INLET SEDIMENT FILTER DETAIL 5
NTS — C38



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

THIS DRAWING CREATED IN AUTOCAD 2010 FILE FORMAT AND WILL BE REVISED ONLY ON AN AUTOCAD SYSTEM. FILE: 14000189–DP3–C38.DWG

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SIGNATURES	DATE
DRAWN J. ALLEN	10/31/11
CHECKED K. RIVERA	10/31/11
SUBMITTED C R. BEST	10/31/11
ST of LICENSURE: FL LICENSE NO: 69875	
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

STORMWATER POLLUTION PREVENTION DETAILS

FILE NO.	SIZE	DWG. NO.	REV
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