LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

10600 CHEVROLET WAY, SUITE 300
ESTERO, FL 33928
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TETRA TECH

Steven J Agapi, P.E., State of Florida, Professional Engineer, License No. 88612

This item has been electronically signed and sealed by Steven J Agapi, P.E. on the date indicated here using a SHA authentication code.

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PROJECT SITE

Steven J Agapi, P.E. #88612

Digitally signed by Steven J Agapi, P.E. #88612
Date: 2020.08.25 14:59:55 -04'00'

BID SET
AUGUST 2020

PREPARED FOR

LEE COUNTY UTILITIES
1500 MONROE ST.
FORT MYERS, FLORIDA 33901

BOARD OF COUNTY COMMISSIONERS

JOHN MANNING	DISTRICT 1
CECIL PENDERGRASS	DISTRICT 2
RAY SANDELLI	DISTRICT 3
BRIAN HAMMAN	DISTRICT 4 (CHAIRMAN)
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LEE COUNTY

STEVEN AGAPI, P.E.
LICENSE #88612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE _____

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PROJECT LOCATION:
LEE COUNTY, FLORIDA

CLIENT INFORMATION:
LEE COUNTY UTILITIES
1500 MONROE ST.
FORT MYERS, FL 33901

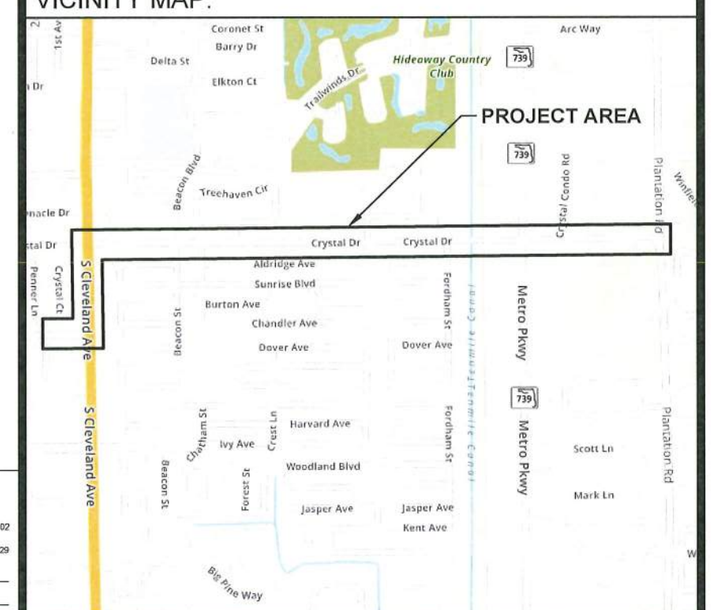
Tt PROJECT No.:
200-01558-19001

CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:
16" WATER MAIN REPLACEMENT AND IMPROVEMENTS ALONG CRYSTAL DRIVE FROM BRANTLEY ROAD TO PLANTATION ROAD

ISSUED:
BID SET - 8-25-2020

VICINITY MAP:



GENERAL NOTES

1. ALL WORK SHALL CONFORM TO LATEST REVISION OF THE LCU DESIGN MANUAL WHICH IS AVAILABLE ON OUR WEB-PAGE VIA THE FOLLOWING LINK: HTTPS://WWW.LEEGOV.COM/UTILITIES/DESIGN-MANUAL.
2. ALL REGULATORY AND PERMITTING AGENCIES' REQUIREMENTS SHALL BE COMPLIED WITH AS WELL.
3. ANY QUANTITIES SHOWN ON PLANS ARE NOT VERIFIED BY LCU.
4. THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF CONDITIONS THAT MAY BE ENCOUNTERED DURING THE COURSE OF WORK. ALL CONTRACTORS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATIONS THEY MAY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSION REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.
5. ALL CONSTRUCTION WORK PERFORMED MUST BE DONE BY A CONTRACTOR LICENSED IN THE STATE OF FLORIDA TO DO THE WORK INTENDED.
6. A PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE WORK MAY BEGIN. REQUIRED ATTENDEES INCLUDE BUT ARE NOT LIMITED TO; THE ENGINEER OF RECORD OR HIS DESIGNEE, THE UNDERGROUND CONTRACTOR AND THE LCU INSPECTOR ASSIGNED TO THE PROJECT. LCU IS TO BE NOTIFIED TWO (2) WORKING DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING.
7. ONE COPY OF THE LCU APPROVED/STAMPED CONSTRUCTION PLANS, ALL CONTRACT DOCUMENTS, REFERENCE DOCUMENTS AND TECHNICAL DOCUMENTS SUBMITTED MUST BE KEPT AT THE SITE AND MAINTAINED IN GOOD ORDER.
8. ALL WORK AND MATERIALS, WHICH DO NOT CONFORM TO LCU SPECIFICATIONS, ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
9. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE OF LCU IS SUBJECT TO RE-EXCAVATION, REMOVAL AND REPLACEMENT OF SAME TO BE DONE AT THE CONTRACTOR'S EXPENSE.
10. LCU INSPECTION STAFF IS TO BE PRESENT FOR ALL HOT TAPS, PRESSURE TESTS AND FOR ANY NECESSARY INSPECTION. THE CONTRACTOR IS TO PROVIDE A MINIMUM OF TWO (2) WORKING DAYS NOTICE PRIOR TO SCHEDULING ANY OF THE ABOVE.
11. TRAFFIC MUST BE MAINTAINED AT ALL TIMES AS PER LEE COUNTY DEPARTMENT OF TRANSPORTATION (LCDOT) AND PER FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
12. THE CONTRACTOR IS TO UNCOVER ALL EXISTING LINES BEING TIED INTO AND VERIFY GRADES BEFORE BEGINNING CONSTRUCTION.
13. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS, BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. LCU WILL NOT GUARANTEE ANY LOCATIONS AS SHOWN ON THESE PLANS OR THOSE OMITTED FROM THESE PLANS.
14. THE CONTRACTOR SHALL VERIFY ALL UTILITIES AND PROVIDE AT LEAST TWO (2) WORKING DAYS NOTICE TO THE INDIVIDUAL UTILITY COMPANIES, FDOT AND LCDOT PRIOR TO CONSTRUCTION.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND TAKE ALL POSSIBLE PRECAUTIONS TO AVOID ANY DAMAGE TO ALL UNDERGROUND PIPELINES, TELEPHONE, CABLE TV, ELECTRIC LINES/CONDUITS AND STRUCTURES IN ADVANCE OF ANY CONSTRUCTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MAY OCCUR DUE TO HIS FAILURE TO EXACTLY LOCATE AND PROTECT EXISTING UTILITIES AND STRUCTURES.
16. ANYTHING NOT SHOWN ON THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND SHALL NOT CONSTITUTE AN EXTRA COST, UNLESS APPROVED BY THE ENGINEER OF RECORD.
17. THE CONTRACTOR SHALL CONTACT THE ENGINEER AND LCU IMMEDIATELY CONCERNING ANY CONFLICTS WITH LCU UTILITIES/STRUCTURES ARISING DURING CONSTRUCTION OF ANY FACILITIES SHOWN ON THESE DRAWINGS.
18. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES SHOWN ON THE PLANS. IF ANY DISCREPANCIES IN QUANTITIES ARE FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD AND LCU.
19. THE CONTRACTOR SHALL REPLACE ALL PAVEMENT, CURBS, DRIVEWAYS, SIDEWALKS, FENCES, ETC., WITH THE SAME TYPE OF MATERIAL THAT WAS REMOVED DURING CONSTRUCTION OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL RESTORE ALL AREAS AFFECTED BY THE CONSTRUCTION TO ITS ORIGINAL CONDITION, OR BETTER. THE CONTRACTOR SHALL PROTECT ALL EXISTING SIDEWALKS, PAVEMENT, CURBS AND DRIVEWAYS NOT SHOWN TO BE REPLACED IN THE DRAWINGS. THE CONTRACTOR SHALL REPLACE ALL DAMAGED SIDEWALKS, PAVEMENT, CURBS AND DRIVEWAYS NOT PLANNED FOR REMOVAL OR REPLACEMENT AT THEIR OWN COST.
20. ALL FRAMES, COVERS VALVE BOXES, METER BOXES AND MANHOLES SHALL BE ADJUSTED TO FINISHED GRADE UPON COMPLETION OF PAVING OR RELATED CONSTRUCTION. ALL VALVE PADS SHALL BE POURED IN PLACE. NO PRE-FORMED VALVE PADS WILL BE ALLOWED.

GENERAL NOTES

21. APPROPRIATE TURBIDITY CONTROL DEVICES (E.G. SILT FENCES, HAY BALES) WILL BE UTILIZED DURING ALL PHASES OF INSTALLATION AND GRADING. CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THE NOTICE OF INTENT AND NOTICE OF TERMINATION TO THE EPA IN COMPLIANCE WITH LEE COUNTY'S NPDES PERMIT.
22. CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND MAINTAINING AN EFFECTIVE STORM WATER POLLUTION PREVENTION PLAN.
23. LCU REQUIRES 30" OF COVER FOR ALL UNDERGROUND PIPING EXCEPT UNDER PAVEMENT, WHERE 36" OF COVER IS REQUIRED. IF LCU REQUIRED COVER CANNOT BE MAINTAINED, THE CONTRACTOR SHALL PROVIDE OTHER METHODS OF CONSTRUCTION OR PIPE PROTECTION, WHICH SHALL FIRST BE APPROVED BY LCU AND THE ENGINEER, AT NO ADDITIONAL COST TO THE COUNTY. IF STATE AGENCIES REQUIRE ADDITIONAL COVER, MEETING THE REQUIREMENTS SHALL BE DONE AT NO ADDITIONAL COST TO THE COUNTY.
24. LCU REQUIRES THERE TO BE A MINIMUM OF TEN (10) FEET HORIZONTAL AND 18" VERTICAL SEPARATION BETWEEN POTABLE WATER & SANITARY SEWER MAINS. LCU ALSO REQUIRES MINIMUM OF TEN (10) FEET HORIZONTAL SEPARATION BETWEEN OTHER PUBLIC AND/OR PRIVATE UTILITIES, STRUCTURE(S), BUILDING(S), WALL(S), FOUNTAIN(S), FENCE(S) AND LCU INFRASTRUCTURE UNLESS SPECIFICALLY APPROVED BY LCU.
25. LCU REQUIRES THERE TO BE A MINIMUM OF FIVE (5) FEET HORIZONTAL SEPARATION BETWEEN LCU INFRASTRUCTURE AND DRAINAGE INFRASTRUCTURE, MITERED END SECTIONS, INLETS, ETC. LCU ALSO REQUIRE MINIMUM OF FIVE (5) FEET HORIZONTAL SEPARATION BETWEEN LCU INFRASTRUCTURE AND ALL NEW LIGHT POLE FOUNDATIONS.
26. THE ROOT BALL OF PALM TREES SHALL BE A MINIMUM OF FIVE (5) FEET AND THE ROOT BALL OF SHADE TREES SHALL BE A MINIMUM OF TEN (10) FEET FROM ANY EXISTING OR PROPOSED LCU OWNED AND MAINTAINED PIPE/INFRASTRUCTURE.
27. AS THE WORK PROGRESSES THE CONTRACTOR SHALL RECORD ALL CHANGES AND DEVIATIONS FROM THE LCU STAMPED/APPROVED CONSTRUCTION PLANS. IN ADDITION, HE SHALL RECORD THE EXACT LOCATION OF ALL CHANGES IN VERTICAL AND HORIZONTAL ALIGNMENT WITH COORDINATES WITH RESPECT TO THE NAVD 1988 STATE PLANE FLORIDA WEST COORDINATE SYSTEM AS WELL AS ALL REQUIREMENTS SET FORTH IN THE LCU DESIGN MANUAL. THIS INFORMATION IS TO BE FORWARDED TO THE ENGINEER OF RECORD WHO PREPARED, SIGNED AND SEALED APPROVED CONSTRUCTION PLANS SO THAT HE CAN PREPARE 'RECORD DRAWINGS' PER THE REQUIREMENTS SET FORTH IN THE LCU DESIGN MANUAL.
28. EXISTING SUBSURFACE UTILITY HORIZONTAL AND VERTICAL ALIGNMENTS WERE ESTABLISHED THROUGH THE USE OF AVAILABLE RECORDS AND, THEREFORE, ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL NOTIFY THE RESPECTIVE UTILITY COMPANIES NO LATER THAN 48 HOURS PRIOR TO COMMENCING WORK IN A SPECIFIC AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF ALL UTILITIES SIZE AND LOCATIONS.
29. BURIED PHONE LINES EXIST THROUGHOUT THE LIMITS OF WORK BUT MAY NOT BE IDENTIFIED ON THE DRAWINGS. PROCEED WITH CAUTION TO MAINTAIN THE PHONE SERVICES. DAMAGES TO, OR RELOCATION OF PHONE LINES DURING CONSTRUCTION SHALL BE REPORTED IMMEDIATELY TO AND/OR COORDINATED WITH THE SERVICE PROVIDER AND REPAIRED OR RELOCATED AT THE CONTRACTOR'S EXPENSE.
30. WATER, SEWER, AND IRRIGATION SERVICES MAY EXIST WITHIN THE LIMITS OF WORK BUT MAY NOT BE IDENTIFIED ON THE DRAWINGS. PROCEED WITH CAUTION TO MAINTAIN ALL SERVICES. DAMAGES TO, OR RELOCATION OF SERVICES DURING CONSTRUCTION SHALL BE REPORTED IMMEDIATELY TO AND/OR COORDINATED WITH LEE COUNTY UTILITIES AND REPAIRED OR RELOCATED AT THE CONTRACTOR'S EXPENSE.
31. OVERHEAD AND UNDERGROUND ELECTRIC LINES EXIST THROUGHOUT THE LIMITS OF WORK BUT MAY NOT BE SHOWN ON THE DRAWINGS. PROCEED WITH CAUTION TO PROTECT THE ELECTRIC LINES AND POLES. DAMAGES TO, OR RELOCATION OF ELECTRIC LINES OR POLES SHALL BE REPORTED IMMEDIATELY TO AND/OR COORDINATED WITH POWER COMPANY AND REPAIRED OR RELOCATED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL UTILITY POLE BRACING REQUIRED BY HIS OPERATIONS.
32. BURIED CABLE AND FIBER OPTIC LINES EXIST THROUGHOUT THE LIMITS OF WORK BUT MAY NOT BE SHOWN ON THE DRAWINGS. PROCEED WITH CAUTION TO PROTECT THE BURIED CABLE AND FIBER OPTIC LINES. DAMAGES TO OR RELOCATION OF CABLE AND FIBER OPTIC LINES SHALL BE REPORTED IMMEDIATELY TO AND/OR COORDINATED WITH THE RESPECTIVE UTILITY AND REPAIRED OR RELOCATED AT THE CONTRACTOR'S EXPENSE.
33. CONTRACTOR SHALL EXCAVATE TEST PITS FOR THE PURPOSE OF PROTECTING AND CONFIRMING LOCATION AND DEPTH OF EXISTING UTILITIES OR STRUCTURES IN ADVANCE OF CONSTRUCTION. TEST PITS SHALL BE DUG BY HAND OR SOFT DIG METHOD AND BACKFILLED IMMEDIATELY AFTER THEIR PURPOSE HAS BEEN SATISFIED AND SHALL NOT REMAIN OPEN DURING NONWORKING HOURS.
34. CONTRACTOR SHALL ENSURE THAT PEAK PARTICLE VELOCITY AS MEASURED BY A GEOPHONE, SEISMOGRAPH, OR OTHER APPROPRIATE DEVICE DOES NOT EXCEED 0.5 INCHES PER SECOND AS MEASURED AT THE RIGHT-OF-WAY LINE DURING ROCK EXCAVATION AND COMPACTION. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, MONITORING, CALIBRATING, AND MAINTAINING ALL VIBRATION MONITORING EQUIPMENT. IF AT ANY TIME THE PEAK PARTICLE VELOCITY EXCEEDS 0.5 INCHES PER SECOND THEN THE CONTRACTOR SHALL MODIFY HIS CONSTRUCTION OPERATIONS AS NECESSARY, INCLUDING BUT NOT LIMITED TO USING STATIC COMPACTION METHODS IN LIEU OF VIBRATORY ROLLERS.

GENERAL NOTES

35. CONTRACTOR TO CONDUCT PRE CONSTRUCTION PHOTO/VIDEO SURVEY OF STRUCTURES ON CRYSTAL DRIVE. CONTRACTOR TO MONITOR VIBRATION CAUSED BY CONSTRUCTION ACTIVITIES AND TAKE PROPER MEASURES TO MITIGATE DAMAGE TO ALL STRUCTURES. ALL COSTS ASSOCIATED WITH DAMAGE TO STRUCTURES CAUSED BY THE CONTRACTOR AND/OR CONSTRUCTION ACTIVITIES WILL BE PAID FOR BY THE CONTRACTOR AT NO COST TO THE COUNTY.
36. DEPTHS OF SANITARY SEWER MAINS AND MANHOLES WERE DERIVED FROM GIS, RECORD DRAWINGS, AND OTHER SOURCES. CONTRACTOR IS HEREBY ADVISED THAT PRIOR TO CONSTRUCTION, DEPTHS SHALL BE FIELD VERIFIED AND ANY POTENTIAL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND LEE COUNTY PRIOR TO PROCEEDING. CONTRACTOR IS HEREBY ADVISED THAT THE PROPOSED DEPTH OF THE WATER MAIN MAY NEED TO BE ADJUSTED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND CONFIRM THAT ALL MINIMUM SEPARATION REQUIREMENTS ARE MAINTAINED.
37. CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION, ANY POTENTIAL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND LEE COUNTY PRIOR TO PROCEEDING.
38. TREES AND BUSHES SHOWN WERE DERIVED FROM GIS AND AERIAL SOURCES AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
39. CONTRACTOR MUST UTILIZE AN ARBORIST WHO IS CAPABLE IN EVALUATING OAK TREES THROUGHOUT THE PROJECT AND PROVIDE TRIMMING SERVICES AS NEEDED TO MITIGATE DAMAGE TO TREES. IF ANY PROPOSED WORK IS FOUND BY THE ARBORIST TO POTENTIALLY CAUSE DEATH OR SEVERE DAMAGE TO OAK TREES, THE CONTRACTOR MUST BRING THE CONFLICT TO THE ATTENTION OF THE COUNTY AND ENGINEER FOR FINAL DECISION.
40. DRIVEWAY CULVERT END TREATMENTS IN CONFLICT WITH THE PROPOSED WATER MAIN SHALL BE REMOVED AND REPLACED WITH CONCRETE MITERED END SECTIONS AS SHOWN ON THE DETAIL SHEETS HEREIN.

SURVEY NOTES

1. DATE OF LAST FIELDWORK: APRIL 6, 2020.
2. COORDINATES AND HORIZONTAL DATA SHOWN HEREON AND IN AUTOCAD FILE ARE IN FEET AND ARE PROJECTED ONTO THE FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE, NORTH AMERICAN DATUM OF 1983 (NAD83), 2011 ADJUSTMENT.
3. VERTICAL DATA (ELEVATIONS) SHOWN HEREON ARE IN FEET AND ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). THE REFERENCE BENCHMARK IS FDOT BM 197 FOR FINANCIAL PROJECT ID 416519-1 (STATE RD 45, CLEVELAND AVENUE) WITH A PUBLISHED ELEVATION OF 11.119 FEET (NGVD29) AND CONVERTED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) USING A CONVERSION FACTOR OF -1.18 FEET FOR AN ELEVATION OF 9.94 (NAVD88).
4. SURVEYED AREA IS IN F.E.M.A. FLOOD ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLANE, NO BASE FLOOD ELEVATION DETERMINED) AS SHOWN ON THE NATIONAL FLOOD INSURANCE PROGRAM'S DIGITAL FLOOD INSURANCE RATE MAP (D.F.I.R.M.) COMMUNITY PANEL NUMBER 12070C0428G, EFFECTIVE DATE: DECEMBER 7, 2018.
5. SUBSTANTIAL VISIBLE IMPROVEMENTS OTHER THAN THOSE SHOWN, NOT LOCATED. UNDERGROUND IMPROVEMENTS AND/OR ENCROACHMENTS WERE NOT LOCATED AS A PART OF THIS SURVEY.
6. THIS SURVEY IS SUBJECT TO ANY FACTS THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH. A TITLE COMMITMENT AND/OR ABSTRACT OF TITLE WAS NOT PROVIDED TO THE SURVEYOR.
7. THIS SURVEY DOES NOT MAKE ANY REPRESENTATION AS TO ZONING OR DEVELOPMENT RESTRICTIONS.
8. NO ENVIRONMENTAL ASSESSMENT OR AUDIT WAS PERFORMED ON THE SURVEYED AREA BY THIS FIRM. THIS SURVEY WAS PERFORMED FOR THE PURPOSE SHOWN HEREON AND DOES NOT MAKE ANY REPRESENTATION AS TO THE DELINEATION OF ANY JURISDICTIONAL LINES EXCEPT AS SHOWN OR NOTED. THIS SURVEY DOES NOT PURPORT TO DELINEATE THE REGULATORY JURISDICTION OF ANY FEDERAL, STATE OR LOCAL AGENCY.
9. THIS SURVEY DOES NOT DETERMINE PROPERTY OWNERSHIP OR PROPERTY RIGHTS. THIS SURVEY LOCATED THE BOUNDARY IN ACCORDANCE WITH AND IN RELATION TO THE LEGAL DESCRIPTION.
10. AERIAL PHOTOGRAPHY SHOWN HEREON WAS OBTAINED FROM LABINS (LAND BOUNDARY INFORMATION SYSTEM) AND IS DATED 2017. IT IS INCLUDED FOR ORIENTATION PURPOSES ONLY.

PIPING MATERIAL SCHEDULE

MARK	SERVICE	BURIED PIPE			BURIED FITTINGS	
		MATERIAL	CLASS	LINING	MATERIAL	LINING
PW	POTABLE (≥ 10")	DI	PC 250	CEMENT	DI	CEMENT
PW	POTABLE (< 10")	DI	DR 18	NA	DI	CEMENT
PW	POTABLE (DIRECTIONAL DRILLS)	HDPE	DR11	NA	DI	CEMENT
PW	POTABLE CASING FOR HDD	HDPE	DR 13.5	NA	DI	CEMENT

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STEVEN AGAPI, P.E.
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Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
GENERAL NOTES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

G-001

Bar Measures 1 inch

LIST OF STANDARD ABBREVIATIONS

A	
AAP	ALARM ANNUNCIATOR PANEL
ARV	AUTOMATIC AIR RELEASE VALVE
AAV	AUTOMATIC AIR VENT
AB	ANCHOR BOLT
ABAN	ABANDON(ED)
ABV	ABOVE
AC	ALTERNATING CURRENT
ACCMP	ASPHALT-COATED CORRUGATED METAL PIPE
ACP	ASBESTOS CEMENT PIPE
ADDM	ADDENDUM
ADH	ADHESIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFS	ABOVE FINISHED SLAB
AHD	AHEAD
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMT	AMOUNT
ANT	ANTENNA
APRX	APPROXIMATE(LY)
ARCH	ARCHITECT(URAL)
AS	ALUM SOLUTION
ASPH	ASPHALT
ASSY	ASSEMBLY
AVE	AVENUE
A/C	AIR CONDITIONING
A/VV	AIR/VACUUM AIR VALVE
B	
BAF	BAFFLE
BCV	BALL CHECK VALVE
BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BI	BLACK IRON
B/L	BASELINE
BLDG	BUILDING
BLK	BLOCK
BM	BENCH MARK
BOC	BACK OF CURB
BOT	BOTTOM
BP	BASE PLATE
BRG	BEARING
BSP	BLACK STEEL PIPE
BV	BALL VALVE
BW	BOTH WAYS
BWW	BACKWASH WATER
C	
CAP	CAPACITY
CA	COMPRESSED AIR
CAV	COMBINATION AIR VALVE
CB	CATCH BASIN
CCC	CHLORINE CONTACT CHAMBER
CE	CHLORINATED EFFLUENT
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CV	CHECK VALVE
CI	CAST IRON
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
C/L	CENTER LINE
CLF	CHAIN LINK FENCE
CLR	CLEAR OR CLEARANCE
CLVRT	CULVERT
CM	CONCRETE MONUMENT
CMP	CORRUGATED METAL PIPE
CMPA	CORRUGATED METAL PIPE ARCH
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CNR	CORNER
CO	CLEAN OUT
COAG	COAGULANT
COL	COLUMN
COM	COMMON
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCT(ION)
CONT	CONTINUOUS
CONTR	CONTRACT(OR)
COORD	COORDINATE
CO	COMPANY
CP	CONCRETE PIPE
CPP	CORRUGATED PLASTIC PIPE
CPA	CONCRETE PIPE ARCH
CPLG	COUPLING
CR	CONCENTRIC REDUCER
CSG	CASING
CTV	CABLE TELEVISION
CY	CUBIC YARD
CYL	CYLINDER
C&G	CURB AND GUTTER
C/C	CENTER TO CENTER
D	
DAT	DATUM
DBL	DOUBLE
DC	DIRECT CURRENT
DEMO	DEMOLITION
DEPT	DEPARTMENT
DESC	DESCRIPTION
DET	DETAIL
DF	DIESEL FUEL
DH	DRILL HOLE
DI	DUCTILE IRON
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DIR	DIRECTION
DMH	DROP MANHOLE
DN	DOWN
DR	DRAIN
DV	DIAPHRAGM VALVE
DW	DRIVEWAY
DWG	DRAWING
DWV	DRAIN, WASTE, AND VENT
E	
E	EAST
EA	EACH
EB	ELECTRIC RISER
ECC	ECCENTRIC
EF	EACH FACE
EFF	EFFLUENT
E/L	EASEMENT LINE
EL	ELEVATION
ELEC	ELECTRICAL
EM	ELECTRIC METER
EMER	EMERGENCY
EMC	ENCASE(MENT)
ENGR	ENGINEER
EP	EDGE OF PAVEMENT
EPRF	EXPLOSION PROOF
EQUIP	EQUIPMENT
ER	ECCENTRIC REDUCER
ESTM	EASEMENT
EST	ESTIMATE(D)
ET	ELECTRIC TRANSFORMER
EW	EACH WAY
EXC	EXCAVATE
EXP	EXPANSION
EXST	EXISTING
EXST GR	EXISTING GRADE
EXT	EXTERIOR
EXTN	EXTENSION
F	
F	FOUND
FCA	FLANGED COUPLING ADAPTER
FB	FLAT BAR
FCV	FLOW-CONTROL VALVE
FD	FLOOR DRAIN
FDN	FOUNDATION
FDC	FIRE DEPT CONNECTION
FE	FILTER(ED) EFFLUENT
FF	FINISH FLOOR
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH(ED)
FIN GR	FINISH GRADE
FL	FLUORIDE
FLG	FLANGE(D)
FLL	FLOW LINE
FLTR	FILTER
FM	FORCE MAIN
FO	FIBER OPTIC
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT OR FEET
FUT	FUTURE
FV	FOOT VALVE
FW	FINISHED WATER
FWP	FACTORY WIRED PANEL
F/F	FACE TO FACE
G	
G	GAS
GA	GAUGE
GAL	GALLON(S)
GALV	GALVANIZED
GIP	GALVANIZED IRON PIPE
GJ	GROOVE JOINT
GM	GAS METER
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GALLONS PER SECOND
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GSR	GROUND STORAGE RESERVOIR
GST	GROUND STORAGE TANK
GT	GROUT
GV	GATE VALVE
H	
HB	HOSE BIBB
HD	HEAVY-DUTY
HDD	HORIZONTAL DIRECTIONAL DRILL
HDPE	HIGH-DENSITY POLYETHYLENE
HDR	HYDRAULIC
HFA	HYDROFLUOSILICIC ACID
HGT	HEIGHT
HNDRL	HAND RAIL
HOA	HAND-OFF-AUTO
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPA	HIGH PRESSURE AIR
HR	HOUR
HWL	HIGH WATER LEVEL
HWY	HIGHWAY
I	
ID	INSIDE DIAMETER
IN	INCH(ES)
INF	INFLUENT
INT	INTERSECTION
INTR	INTERIOR
INV	INVERT
IP	IRON PIPE
IPS	INTERNATIONAL PIPE STANDARD
IR	IRON ROD
IRRV	IRRIGATION VALVE
IW	IRRIGATION WATER
J	
JB	JUNCTION BOX
JBL	JURISDICTIONAL BOUNDARY LINE
JT	JOINT
K	
KPL	KICK PLATE
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
L	
L	LEFT
LAB	LABORATORY
LATL	LATERAL
LAV	LAVATORY
LEN	LENGTH
LB	POUND(S)
LF	LINEAR FEET
LP	LIGHT POLE
LS	LIME SLURRY
LSS	LIME STABILIZED SLUDGE
LVR	LOUVER
LWL	LOW WATER LEVEL
M	
M	METER
MAINT	MAINTAIN OR MAINTENANCE
MAN	MANUAL(LY)
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MAILBOX
MCC	MOTOR CONTROL CENTER
ME	MITERED END
MECH	MECHANICAL
MEG	MATCH EXISTING GRADE
MFR	MANUFACTURE(R)
MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MI	MILE(S)
MIN	MINIMUM, MINUTE(S)
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MIXED LIQUOR
MO	MASONRY OPENING
MON	MONUMENT
MPH	MILES PER HOUR
MPT	MALE PIPE THREAD
MS	MOTOR STARTER
MSP	MOTOR STARTER PANEL
MTD	MOUNTED
MV	MOTORIZED VALVE
MW	MONITORING WELL
MWL	MEAN WATER LEVEL
MWP	MAXIMUM WORKING PRESSURE
N	
N	NORTH
ND	NAIL & DISK
NE	NORTHEAST
NIC	NOT IN CONTRACT
NL	NAIL
NO	NUMBER
NOM	NOMINAL
NPF	NATIONAL PIPE THREAD
NPT	NATIONAL PIPE TAPER (THREAD)
NPW	NON-POTABLE WATER
NRS	NON-RISING SYSTEM
NTS	NOT TO SCALE
NW	NORTHWEST
N/A	NOT APPLICABLE
O	
OC	ON CENTER
OD	OUTSIDE DIAMETER
ODP	OPEN DRIP PROOF
OE	OVERHEAD UTILITY LINES
OF	OUTSIDE FACE
OH	OVER HEAD
OHW	OVER HEAD WIRE
OPP	OPPOSITE
OPT	OPTIONAL
OR	OFFICIAL RECORDS
OSY	OUTSIDE SCREW AND YOKE
O&M	OPERATION AND MAINTENANCE
P	
P	POST
PA	PROCESS AIR
PB	PLAT BOOK
PC	POINT OF CURVE
PCM	PERMANENT CONTROL MONUMENT
PE	PLAIN END
PG	PAGE
PI	POINT OF INTERSECTION
PK	PK NAIL
PL	PLATE
P/L	PROPERTY LINE
PNV	PINCH VALVE
POB	POINT OF BEGINNING
POJ	PUSH-ON JOINT
POL	POLYMER
PP	POWER POLE
PPD	POUNDS PER DAY
PPM	PARTS PER MILLION
PREFAB	PREFABRICATED
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PRW	PROCESS WATER
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PT	POINT OF TANGENCY
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
Q	
Q	FLOW
QTY	QUANTITY
R	
RAD	RADIUS
RAS	RETURN ACTIVATED SLUDGE
RC	REINFORCED CONCRETE
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCH
RD	ROAD
RDCR	REDUCER
REBAR	REINFORCING STEEL
REF	REFERENCE
REINF	REINFORCE(D)(ING)(MENT)
REM	REMOVE(ABLE)
REQ'D	REQUIRED
RF	RAISED FACE
RJ	RESTRAINED JOINT
RM	ROOM
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RT	RIGHT
RVT	RIVETED
RW	RAW WATER
RWM	RECLAIMED WATER MAIN
RWW	RAW WASTEWATER
R/W	RIGHT-OF-WAY
S	
S	SOUTH
SA	SAMPLE LINE
SAN	SANITARY
SEC	SECTION CORNER
SCHED	SCHEDULE
SD	STORM DRAIN
SE	SOUTHEAST
SECT	SECTION
SEFF	SECONDARY EFFLUENT
SF	SQUARE FOOT OR FEET
SH	SPRINKLER HEAD
SHT	SHEET(ED)(ING)
SIG	SIGNAL
SIM	SIMILAR
SL	SLUDGE
SLV	SLEEVE
SM	SHEET METAL
SOLN	SOLUTION
SP	SOIL PIPE, SPACE(ING)
SPEC	SPECIFICATION
SPIG	WATER SPIGOT
SPRT	SUPPORT
SQ	SQUARE
SS	SANITARY SEWER
SSE	SUBSTANDARD EFFLUENT
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STK	STAKE
STL	STEEL
STR	STRAIGHT
STRUCT	STRUCTURAL
SURF	SURFACE
SV	SEWER VALVE
SVCE	SERVICE
SVW	SERVICE WATER
SW	SOUTHWEST
SWD	SIDEWATER DEPTH
SWSH	SURFACE WASH
SYM	SYMBOL
SYMM	SYMMETRICAL
S/W	SIDEWALK
T	
TAN	TANGENT
TB	TELEPHONE RISER
TBA	TO BE ABANDONED
TBM	TEMPORARY BENCH MARK
TB-xx	TEST BORING-xx (e.g. TB-1)
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TE	TOTALLY ENCLOSED
TEFC	TOTALLY ENCLOSED FAN COOLED
TEL	TELEPHONE
TENV	TOTALLY ENCLOSED NON-VENTILATED
THD	THREAD(ED)
THK	THICK(NESS)
TLM	TELEMETRY
TOB	TOP OF BANK
TOC	TOP OF CURB
TOS	TOE OF SLOPE
TOT	TOTAL
TP	TRAVERSE POINT
TS	THICKENED SLUDGE
TSC	TRAFFIC SIGNAL CONTROL
TSP	TRAFFIC SIGNAL POST
TV	CABLE TELEVISION
TYP	TYPICAL
T&B	TOP AND BOTTOM
U	
UD	UNDERDRAIN
UE	UNDERGROUND ELECTRIC
UG	UNDERGROUND
ULT	ULTIMATE
UN	UNION
UON	UNLESS OTHERWISE NOTED
UTIL	UTILITY
UT	UNDERGROUND TELEPHONE CABLE
V	
V	VOLT(S)
VAC	VACUUM
VAR	VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	
W	WATER MAIN
WAS	WASTE ACTIVATED SLUDGE
WCO	WALL CLEAN OUT
WF	WIDE FLANGE
WH	WALL HYDRANT
WL	WATER LINE
WM	WATER METER
WP	WATER PROOF(ING), WORKING POINT
WPR	WORKING PRESSURE
WS	WATER SURFACE
WSP	WELDED STEEL PIPE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WV	WATER VALVE
WW	WASTEWATER
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
WWTP	WASTEWATER TREATMENT PLANT
W/	WITH
W/O	WITHOUT
X	
XC	X CUT
XFER	TRANSFER
Y	
YD	YARD(S)
YH	YARD HYDRANT
YR	YEAR(S) YR

SURVEY LEGEND

AIR RELEASE VALVE	FIRE VALVE
AUTO VACUUME	FLAG POLE
BACKFLOW PREVENTER	FORCE MAIN
BENCH MARK	FORCE MAIN AIR RELEASE VALVE
BOLLARD	GAS PIPELINE MARKER
CABLE RISER	GAS VALVE
CABLE TV BOX	GATE KEY PAD
CATCH BASIN	GROUND LIGHT
CENTERLINE	GREASE MANHOLE
CLEANOUT	GUARD RAIL
001 COORDINATE NUMBER	GUY POLE
CONCRETE POWER POLE	GUY WIRE
CONCRETE POST	HANDI-CAP PARKING
DRAINAGE MANHOLE	HOSE BIBB
ELECTRICAL BOX	IRRIGATION BOX
ELECTRIC OUTLET	IRRIGATION VALVE
ELECTRIC METER	LIGHT POLE
ELECTRIC TRANSFORMER W/ PAD	MAIL BOX
ELECTRIC LINE	MITERED END
ELECTRIC FLAG	WELL
+0.00 EXISTING ELEVATION	OVERHEAD POWER LINE
FENCE - BARBED WIRE	OVERHEAD TELEPHONE LINE
FENCE - CHAIN LINK / U.O.N.	PARKING PAY METER
FENCE - WOOD / U.O.N.	POWER POLE
FIBER OPTIC MARKER / POST	POWER POLE w/RISER
FIBER OPTIC BOX	RECLAIM WATER LINE FLAG
FIRE HYDRANT	SEWER LINE FLAG

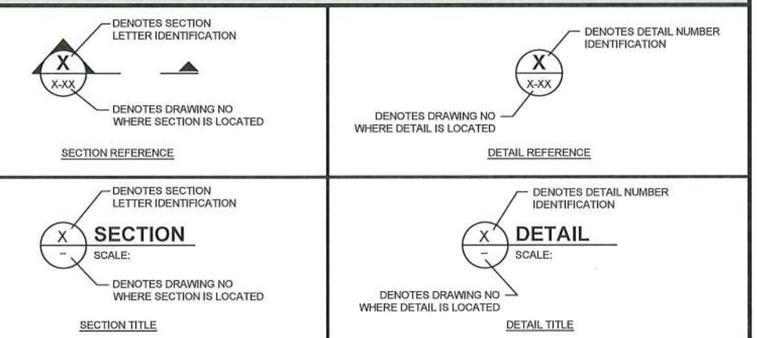
SANITARY SEWER LINE	CROSS WALK SIGNAL POLE
SEWER MANHOLE	CROSS WALK BUTTON POLE
SEWER VALVE	BUSH
SECURITY SENSOR	CABBAGE PALM
SIGN SINGLE POST	OAK TREE
SIGN DOUBLE POST	PALM TREE
SPRINKLER	PINE TREE
STEEL POST	SHADE TREE (VARIOUS TYPE)
TELEPHONE BOX OR VAULT	FOUND CONCRETE MONUMENT
TELEPHONE CANISTER	FOUND DRILL HOLE
TELEPHONE FLAG	FOUND IRON ROD
TELEPHONE MANHOLE	FOUND IRON ROD & CAP
TELEPHONE RISER	FOUND NAIL
TOE OF SLOPE	FOUND NAIL & DISK
TOP OF BANK	FOUND PARKER KALON NAIL
TRAFFIC SIGNAL BOX	FOUND PARKER KALON NAIL & DISK
TRAFFIC SIGNAL POLE	SET CONCRETE MONUMENT
TRAFFIC SIGNAL LIGHT	SET DRILL HOLE
UNDERGROUND UTILITIES	SET 5/8" IRON ROD & CAP "CARDNO LB 7975" U.O.N.
UNKNOWN UTILITY VAULT	SET MAG NAIL & DISK "CARDNO LB 7975" U.O.N.
WATER MAIN	CONCRETE
WATER LINE FLAG	HEAVY VEGETATION LANDSCAPING
WATER METER	
WATER VALVE	
WOOD POST	
WOOD SUPPORT POLE	
YARD DRAIN	

CIVIL LEGEND

	PROPERTY LINE
	RIGHT OF WAY LINE (R-O-W)
	EASEMENT
130	PROPOSED CONTOUR MAJOR
129	PROPOSED CONTOUR MINOR (LABEL OPTIONAL)
X" PVC	WATER MAIN
	WATER MAIN (DIRECTIONAL DRILL)
	STORM WATER
SS	SANITARY SEWER
FM	SANITARY SEWER (FORCE MAIN)
XX	STEEL FENCE
X	WOOD FENCE
SF	SILT FENCE
	TURBIDITY BARRIER
	VEGETATION

BM BENCHMARK	ELECTRIC TRANSFORMER
ND NAIL & DISK	EVERGREEN TREE
TP TRAVERSE POINT	FIRE HYDRANT
F FOUND IRON (TYPE)	FLAG (AS SHOWN)
S SET IRON (TYPE)	GUY ANCHOR
F FOUND MONUMENT (TYPE)	LIGHT POLE
S SET MONUMENT (TYPE)	MAIL BOX
SC SECTION CORNER	PALM TREE
CO CLEANOUT	P POST
DECIDUOUS TREE	SATELLITE DISH
SPIGOT	UTILITY MANHOLE (AS SHOWN)
SPRINKLER HEAD	UTILITY METER (AS SHOWN)
TRAFFIC SIGN	UTILITY RISER (AS SHOWN)
UTILITY MARKER (AS SHOWN)	UTILITY VALVE (AS SHOWN)
WELL	UTILITY POLE (AS SHOWN)
xXXX SPOT ELEVATION	POWER POLE

REFERENCE SYMBOLS



HATCHING LEGEND

ASPHALT OR CONCRETE SURFACE (SIDEWALK OR ROADWAY)	GRAVEL
OPEN CUT EXISTING PAVEMENT	GROUT
REMOVE AND REPLACE DRIVEWAY/SIDEWALK	ARMORFLEX
SODDED OR SEEDED AND MULCHED AREA OR EXISTING WETLAND	STEEL
EARTH	ALUMINUM
CAST-IN-PLACE CONCRETE	GRATING

MECHANICAL/DRAFTING LEGEND

	EXISTING	PROPOSED
VISIBLE LINE		
HIDDEN LINE		
CENTER LINE		
PHANTOM LINE		
MATCHLINE		

1 3/32" NOTE

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Engineering Business No. 4429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

LEGENDS AND ABBREVIATIONS

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

G-002

Bar Measures 1 inch

7/15/2020 6:50:53 PM - O:\PROJECTS\ORLANDOVER\01558\200-01558-19001\CAD\SHEETFILES\G-002 G-002 LENGENDS AND ABBREVIATIONS.DWG - CYR, STEVE

BENCH MARKS

NAME	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-1	810984.80	697917.50	9.94	FCM 6X6 BRASS DISK FDOT 197
BM-2	811086.80	704290.10	13.89	FCM 4X4 BRASS DISK FDOT 266
BM-3	810925.30	698109.90	10.92	SIRC 1/2 LB642 CP 200
BM-4	810925.70	698607.40	9.37	SIRC 1/2 LB642 CP 201
BM-5	810928.70	699110.20	8.91	SIRC 1/2 LB642 CP 202
BM-6	810931.00	699649.40	8.81	SIRC 1/2 LB642 CP 203
BM-7	810922.30	700159.30	9.15	SIRC 1/2 LB642 CP 204
BM-8	810920.40	700681.90	10.23	SIRC 1/2 LB642 CP 205
BM-9	810924.70	901182.80	10.25	SIRC 1/2 LB642 CP 206
BM-10	810930.40	701672.60	10.98	SIRC 1/2 LB642 CP 207
BM-11	810934.70	702168.30	11.52	SIRC 1/2 LB642 CP 208
BM-12	810945.10	702669.90	11.34	SIRC 1/2 LB642 CP 209
BM-13	810958.40	703180.20	11.86	SIRC 1/2 LB642 CP 210
BM-14	810950.70	703680.00	18.35	SIRC 1/2 LB642 CP 211
BM-15	810971.80	704135.30	14.37	SIRC 1/2 LB642 CP 212
BM-16	810986.30	704630.70	14.42	SIRC 1/2 LB642 CP 213
BM-17	810980.20	705167.30	13.91	SIRC 1/2 LB642 CP 214
BM-18	810989.90	705692.90	13.80	SIRC 1/2 LB642 CP 215
BM-19	810918.80	706101.90	15.64	SIRC 1/2 LB642 CP 216

Sheet List Table

Sheet Number	Sheet Title
G-000	COVER
G-001	G-001 GENERAL NOTES
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G-003	OVERALL KEY PLAN & SHEET INDEX
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C-102	BRANTLEY ROAD PLAN AND PROFILE
C-103	BRANTLEY ROAD PLAN AND PROFILE
C-104	BRANTLEY ROAD PLAN AND PROFILE
C-105	BRANTLEY ROAD PLAN AND PROFILE
C-106	US 41 PLAN AND PROFLE
C-106A	US 41 PLAN AND PROFLE
C-107	CRYSTAL DRIVE PLAN AND PROFILE
C-108	CRYSTAL DRIVE PLAN AND PROFILE
C-109	CRYSTAL DRIVE PLAN AND PROFILE
C-110	CRYSTAL DRIVE PLAN AND PROFILE
C-111	CRYSTAL DRIVE PLAN AND PROFILE
C-112	CRYSTAL DRIVE PLAN AND PROFILE
C-113	CRYSTAL DRIVE PLAN AND PROFILE
C-114	CRYSTAL DRIVE PLAN AND PROFILE
C-115	CRYSTAL DRIVE PLAN AND PROFILE
C-116	CRYSTAL DRIVE PLAN AND PROFILE
C-117	CRYSTAL DRIVE PLAN AND PROFILE
C-118	CRYSTAL DRIVE PLAN AND PROFILE
C-119	CRYSTAL DRIVE PLAN AND PROFILE
C-120	CRYSTAL DRIVE PLAN AND PROFILE
C-121	CRYSTAL DRIVE PLAN AND PROFILE
C-122	CRYSTAL DRIVE PLAN AND PROFILE
C-123	CRYSTAL DRIVE PLAN AND PROFILE
C-124	CRYSTAL DRIVE PLAN AND PROFILE
C-125	CRYSTAL DRIVE PLAN AND PROFILE
C-126	PLANTATION ROAD PLAN AND PROFILE
C-501	CIVIL DETAILS
C-502	CIVIL DETAILS
C-503	CIVIL DETAILS
C-504	CIVIL DETAILS
C-505	SOFT DIG PICTURES
C-506	SOFT DIG PICTURES
C-507	SOFT DIG PICTURES
C-508	SOFT DIG PICTURES
C-509	SOFT DIG PICTURES
C-510	SOFT DIG PICTURES
C-511	SOFT DIG PICTURES
C-512	SOFT DIG PICTURES
C-513	SOFT DIG PICTURES

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DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	LDO COMMENT 6/16/2020	

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
OVERALL KEY PLAN
& SHEET INDEX

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

G-003

Bar Measures 1 inch

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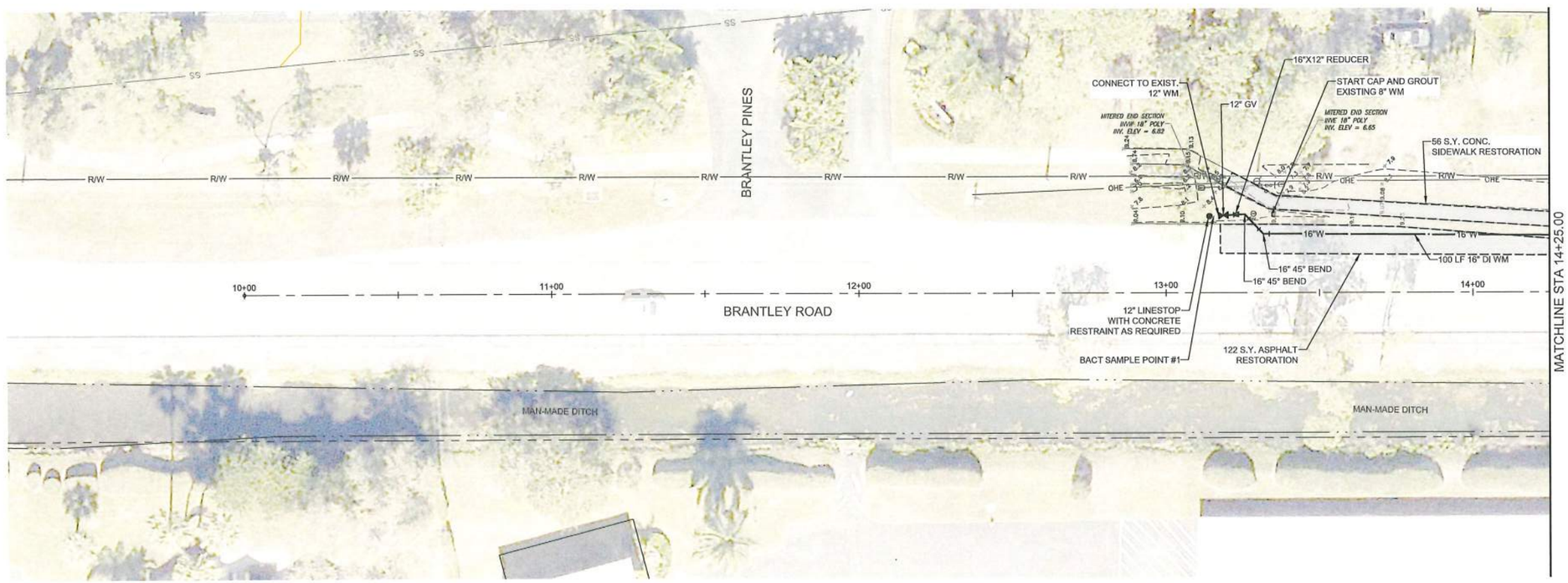
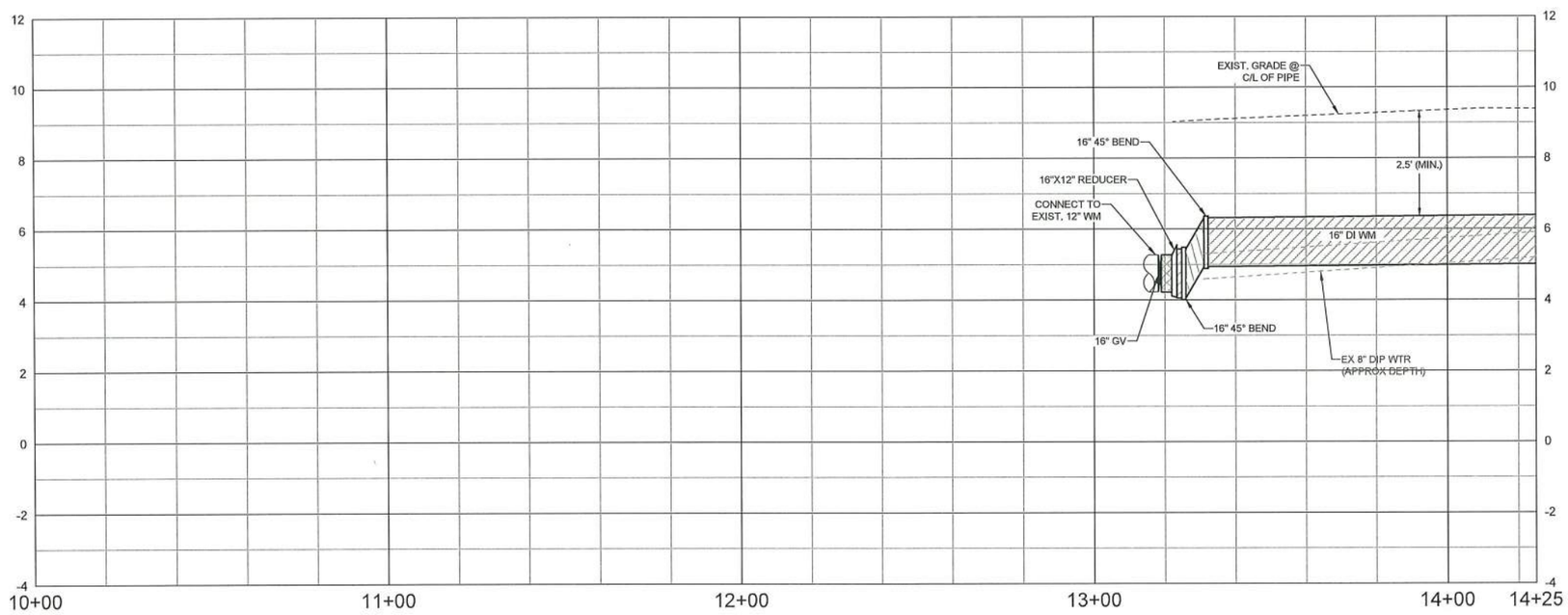


SCALE: 1" = 20'

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
BRANTLEY ROAD
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-101

Bar Measures 1 inch

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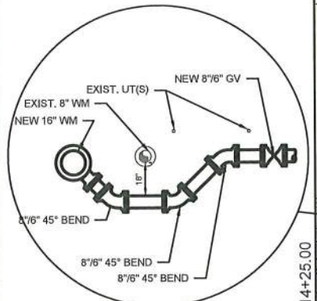
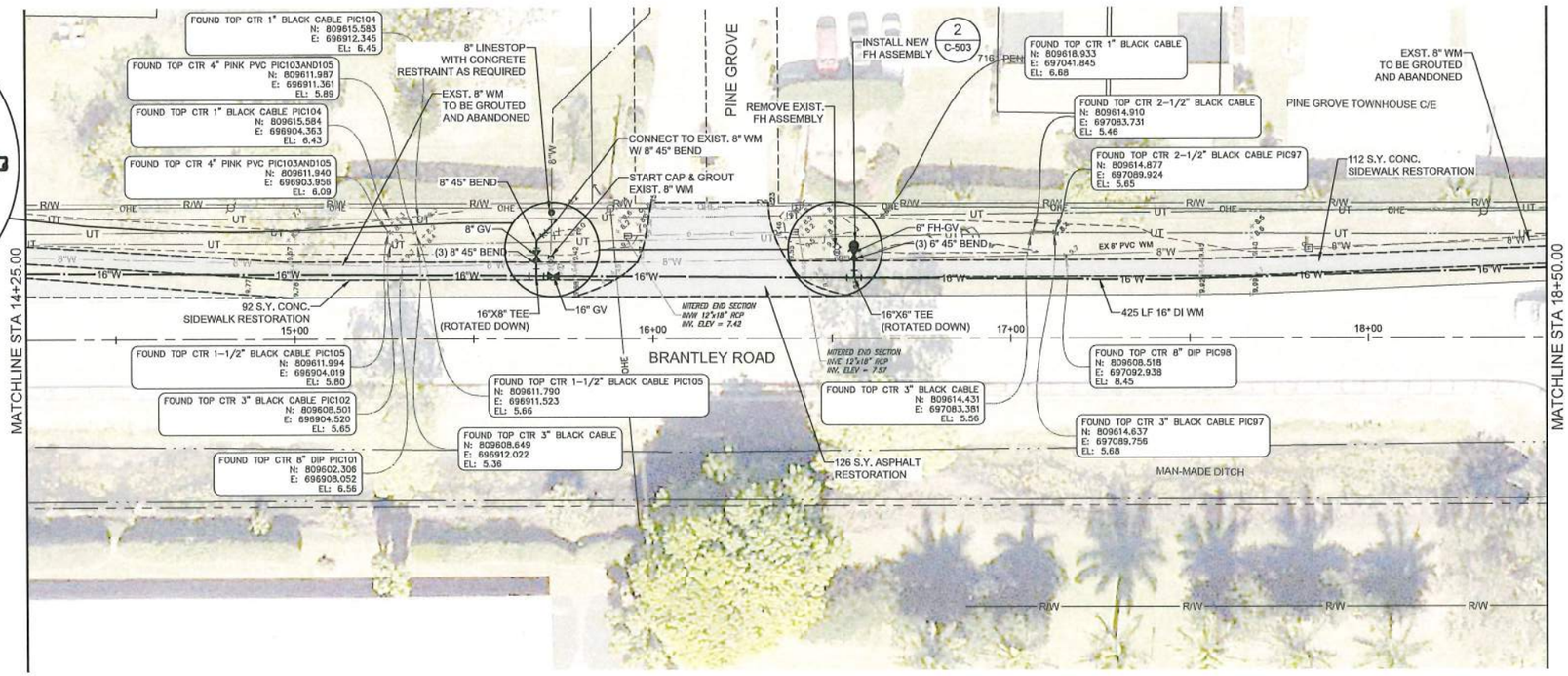
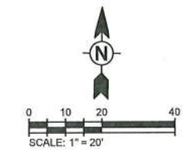
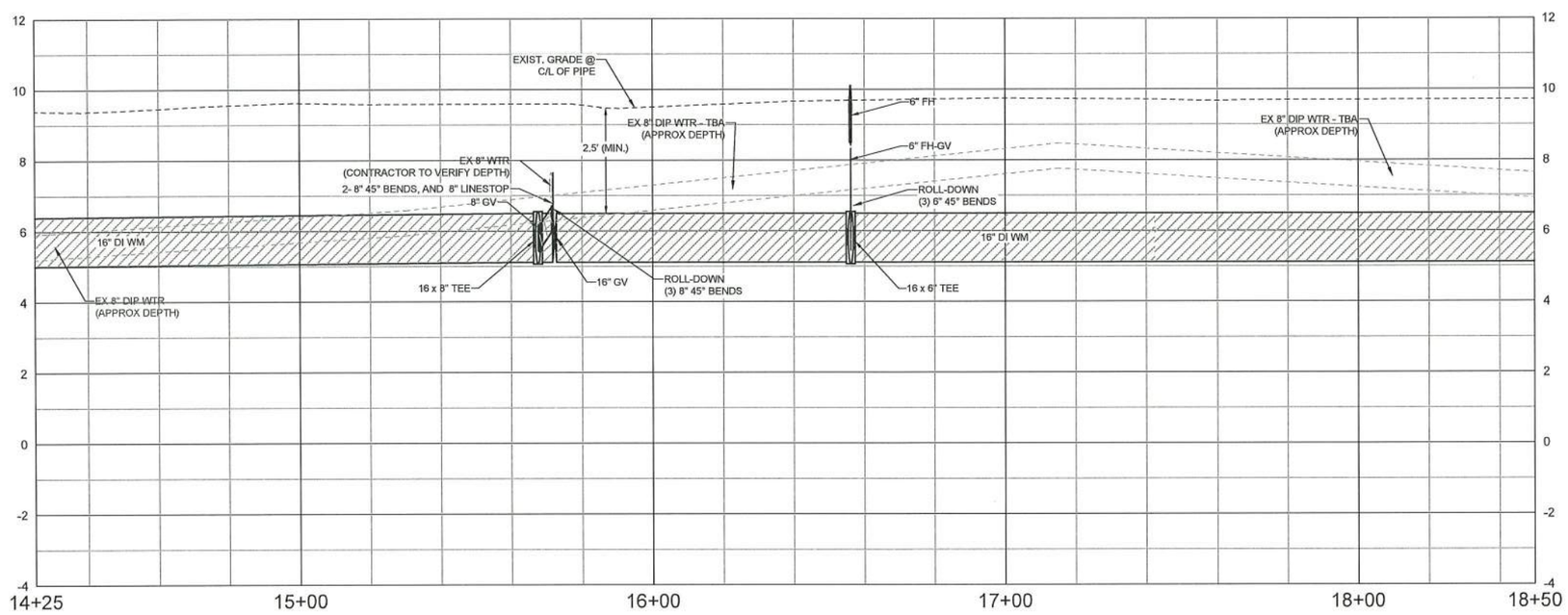


A ROLL-DOWN DETAIL
SCALE: NTS





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
BRANTLEY ROAD
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-102

Bar Measures 1 inch

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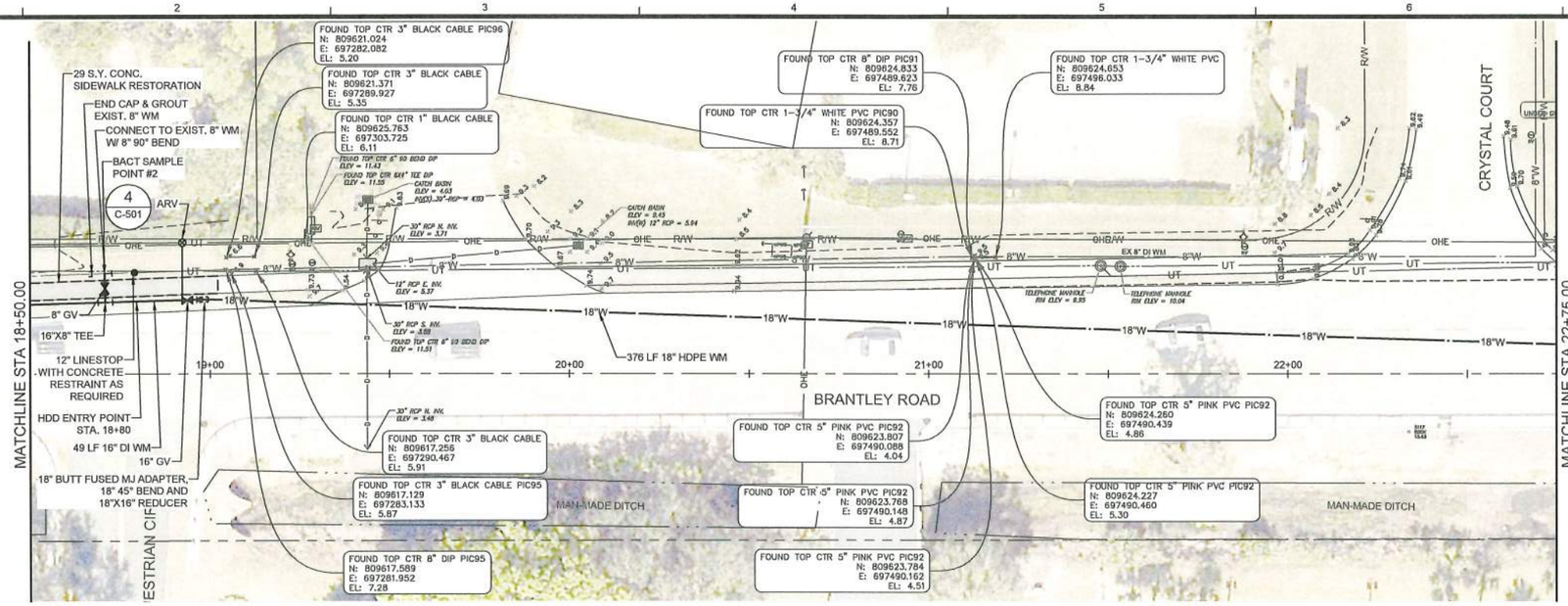

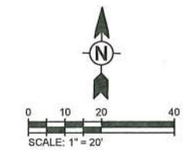

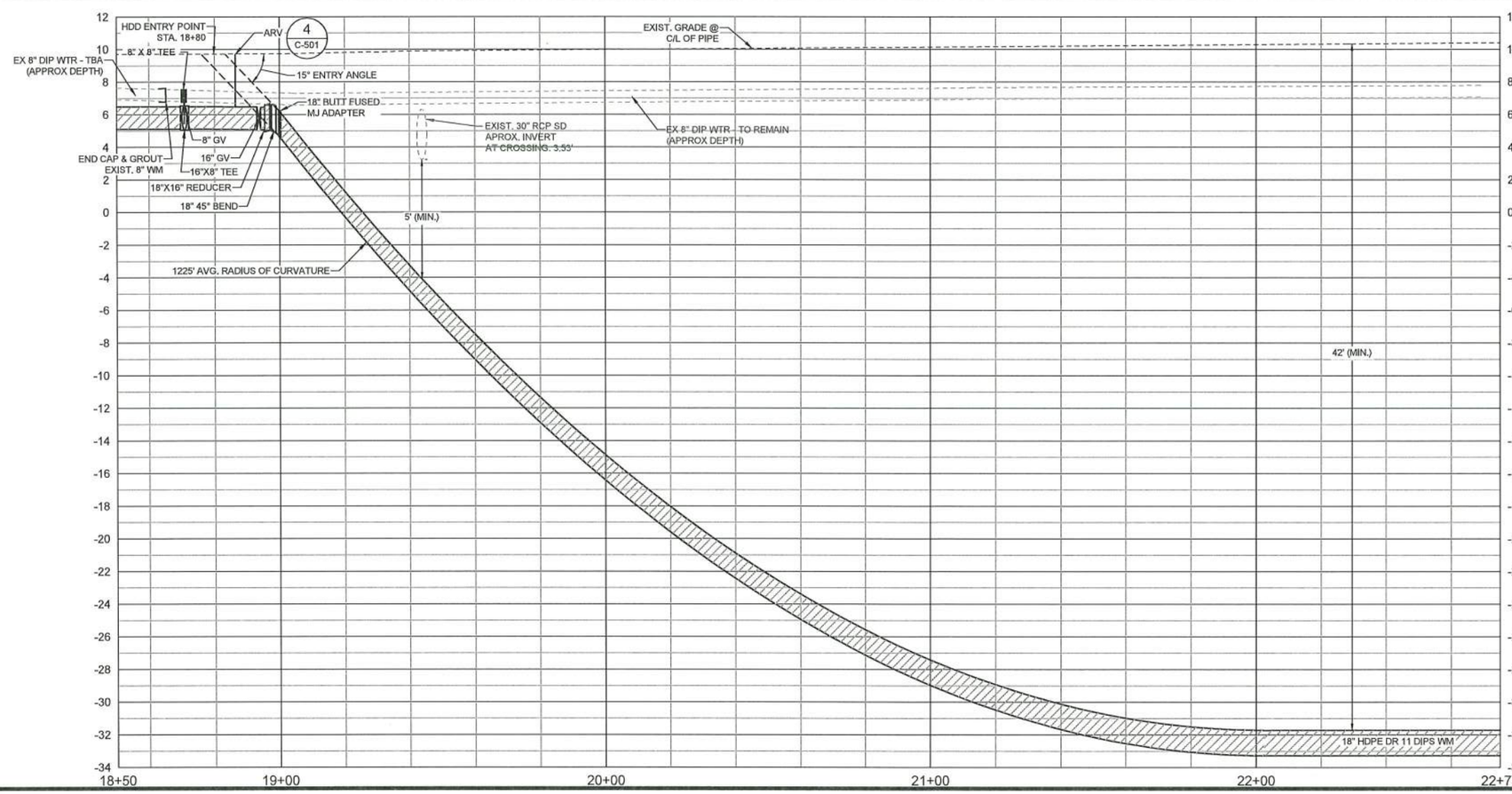

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

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DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

BRANTLEY ROAD PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-103

Bar Measures 1 Inch

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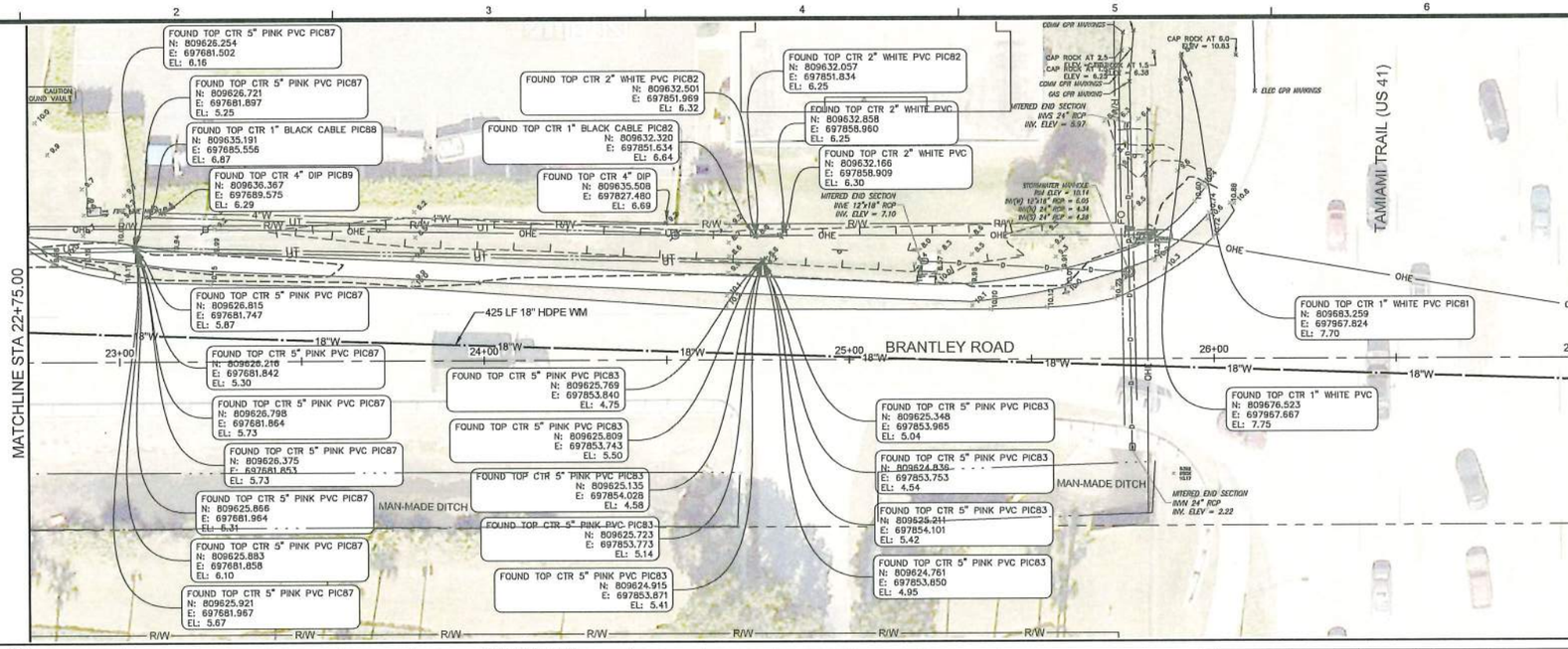

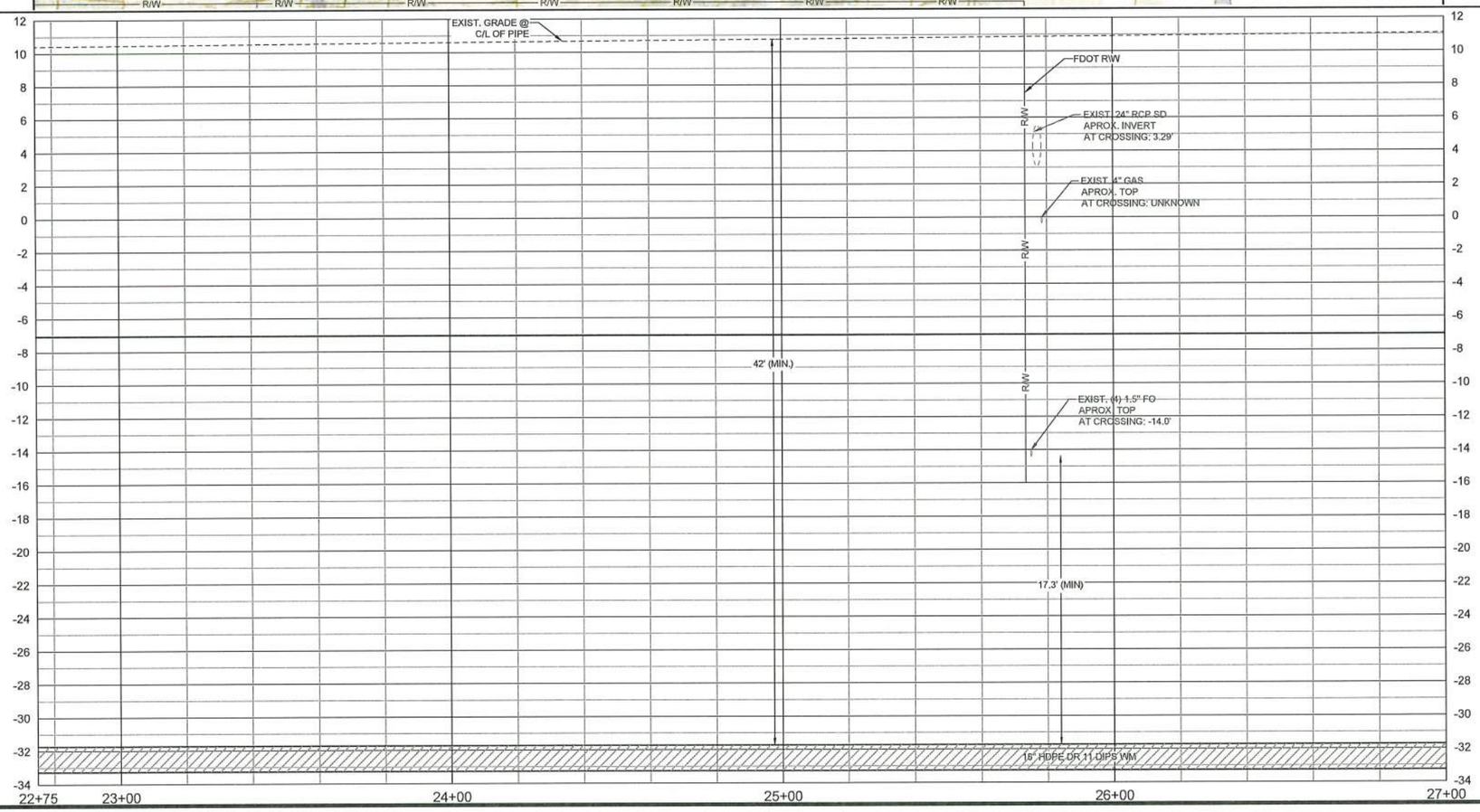

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

NOTE:
THE EXISTING DEPTH OF THE 4" GAS MAIN COULD NOT BE VERIFIED DURING DESIGN. CONTRACTOR SHALL MAKE ALL EFFORTS POSSIBLE TO VERIFY THE DEPTH OF THE EXISTING GAS MAIN PRIOR TO CONSTRUCTION USE EXTREME CAUTION DURING DRILL ACTIVITIES, COORDINATE ALL ACTIVITIES W/ TECO.

SCALE: 1" = 20'

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DATE

MARK	DATE	DESCRIPTION	BY

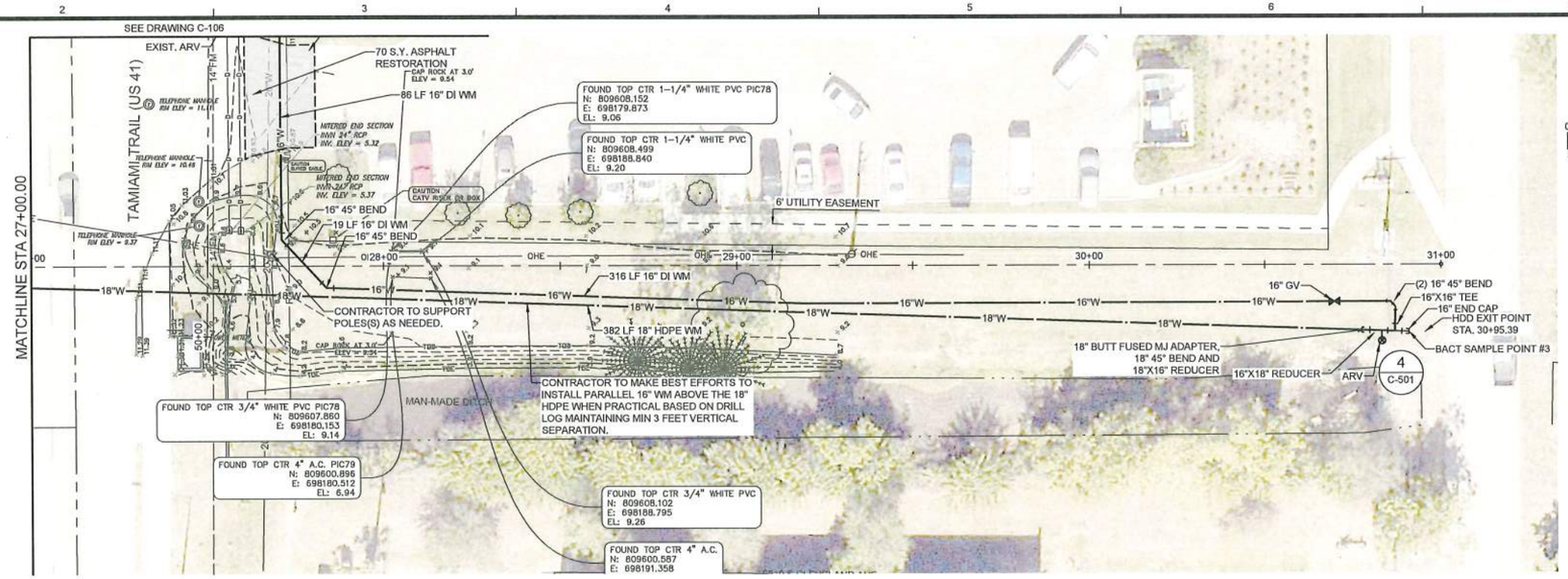
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
BRANTLEY ROAD
PLAN AND PROFILE

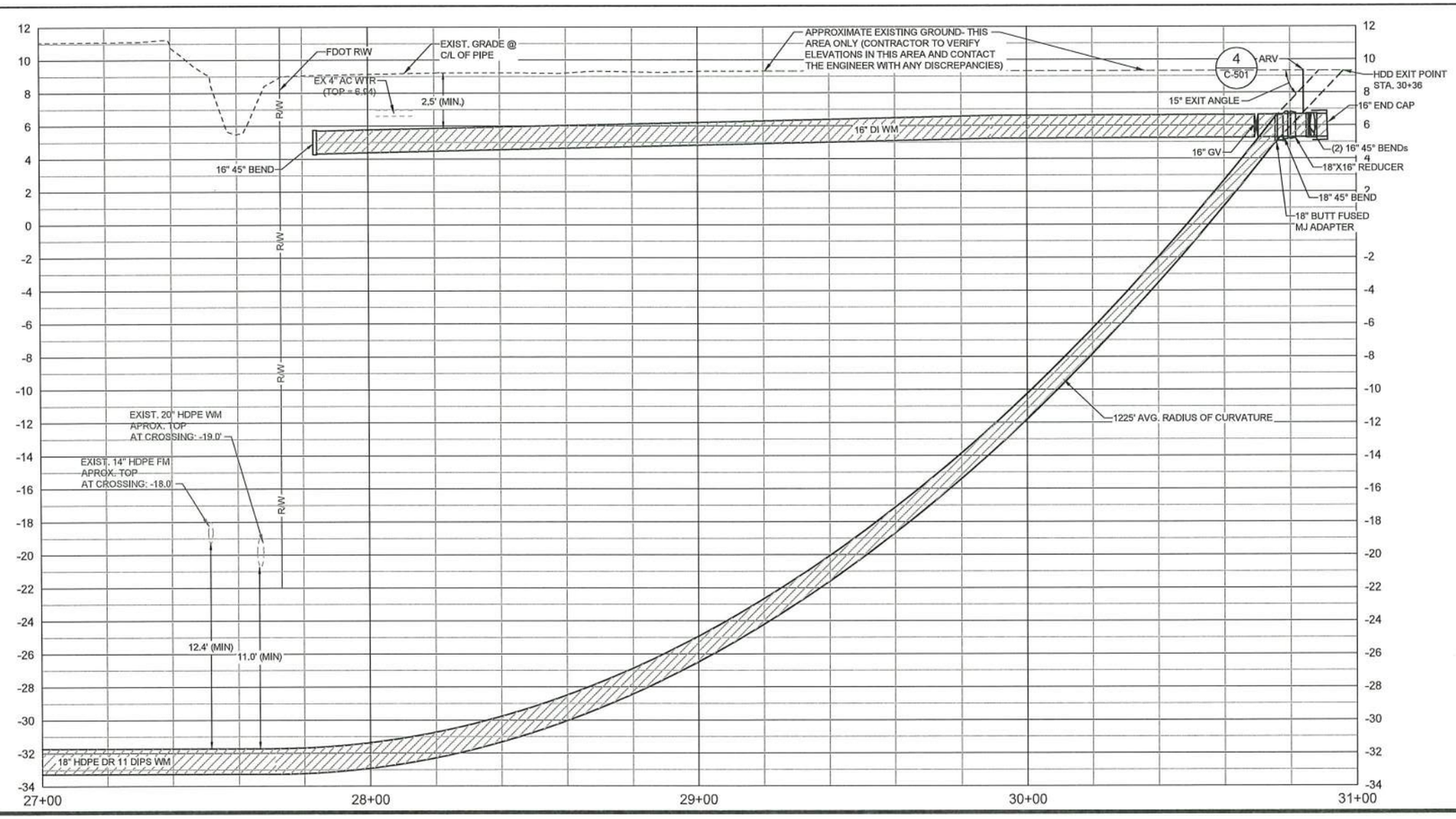
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-104

Bar Measures 1 inch

7/15/2020 7:02:54 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-104 BRANTLEY ROAD PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

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LICENSE #68612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

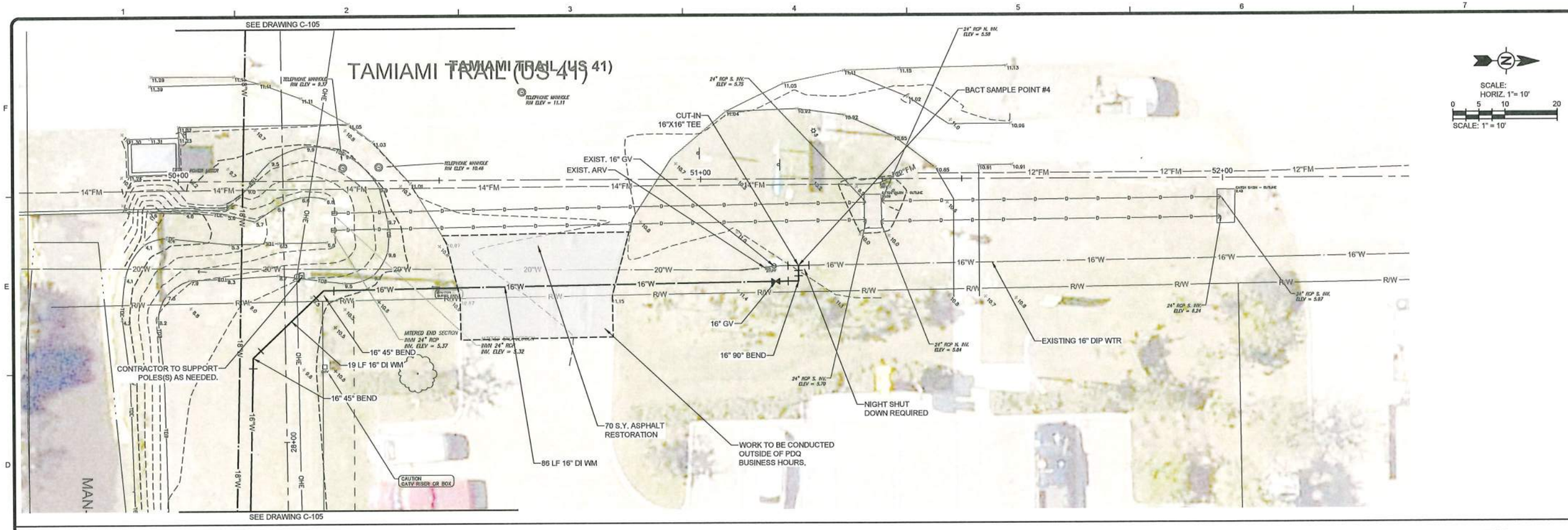
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
BRANTLEY ROAD
PLAN AND PROFILE

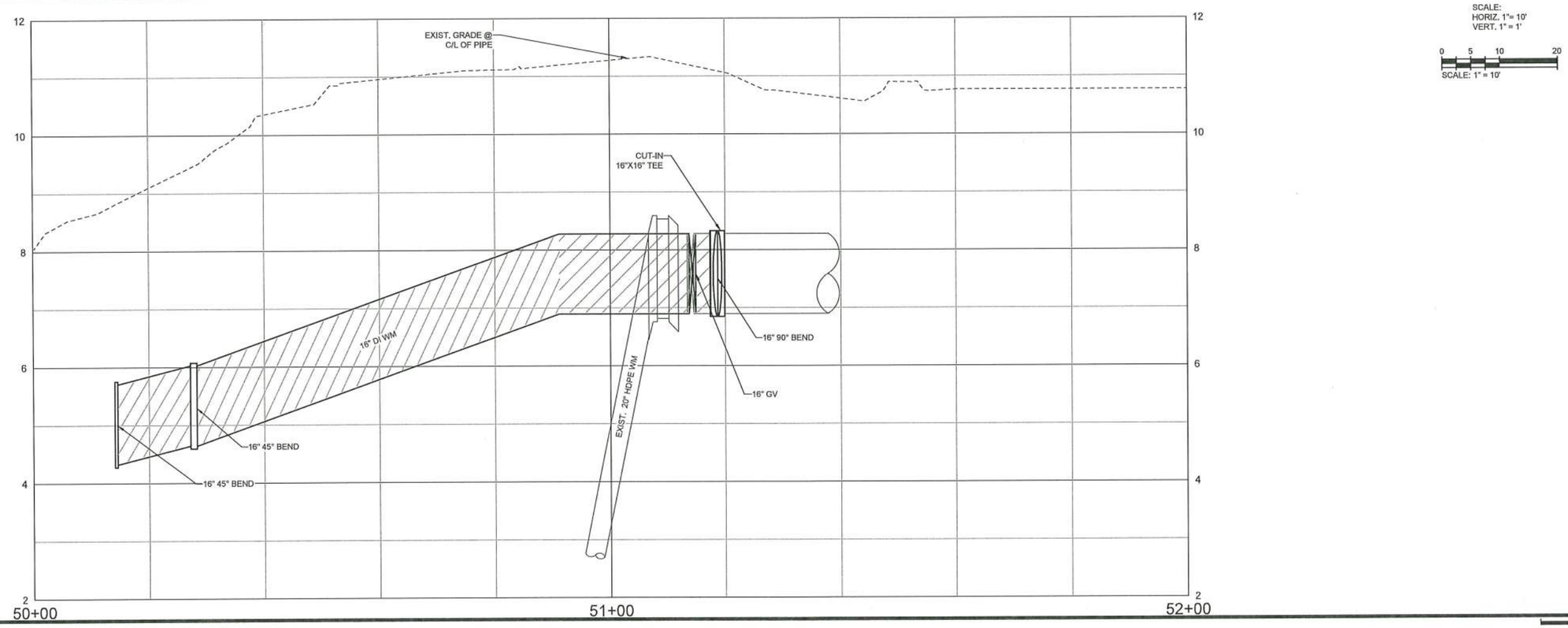
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-105

Bar Measures 1 inch

7/15/2020 7:05:57 PM - O:\PROJECTS\ORLANDO\ER\015558\200-01558-19001\CAD\SHEETFILES\C-105 BRANTLEY ROAD PLAN AND PROFILE.DWG - CYR, STEVE





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10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

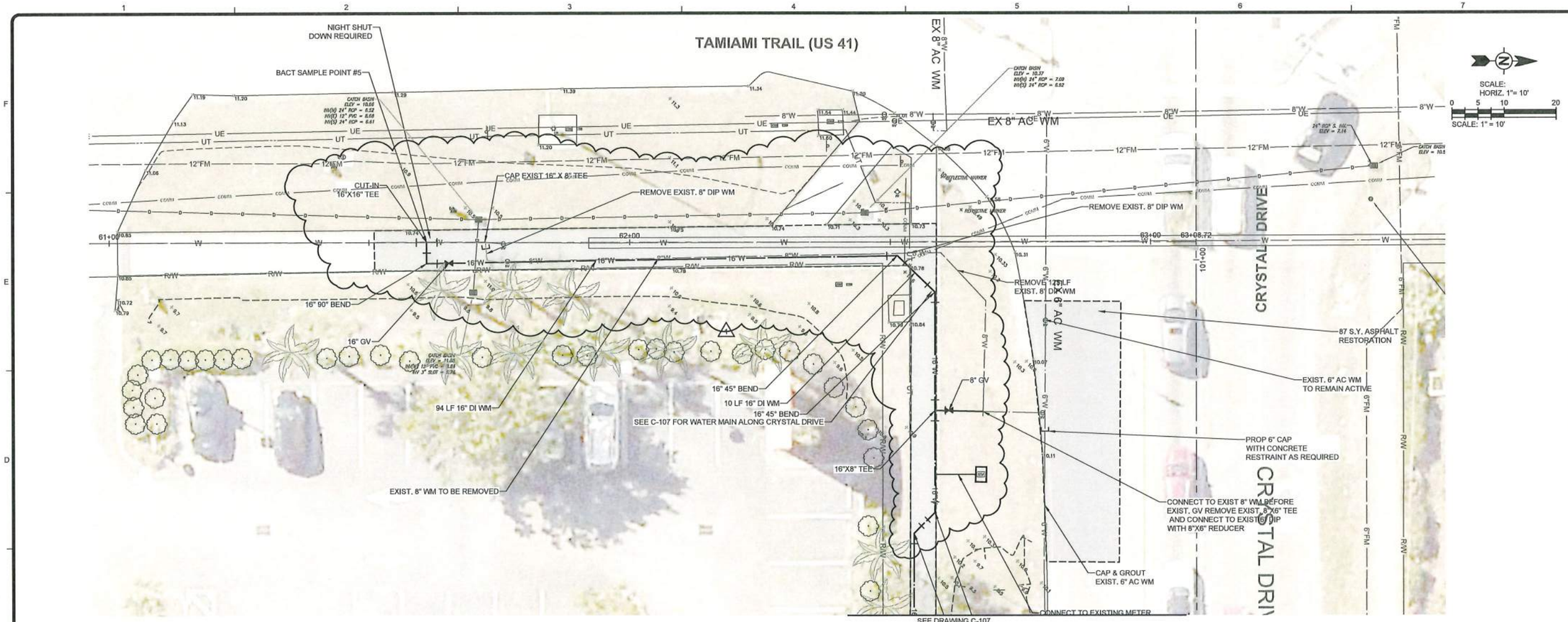
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
TAMIAMI TRAIL (US 41)
PLAN AND PROFILE

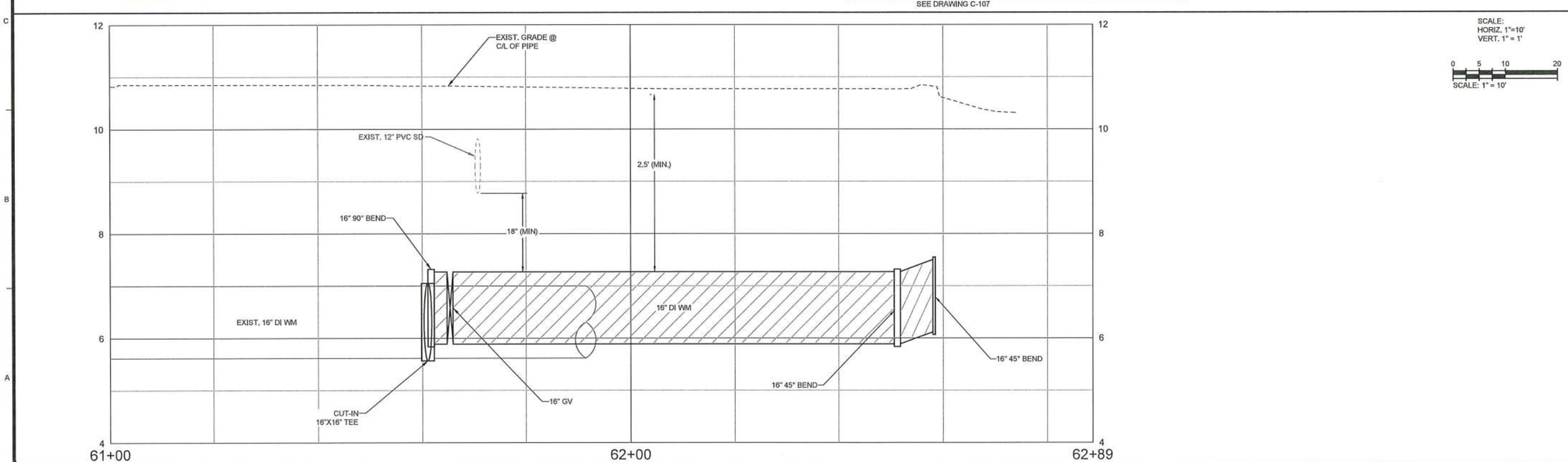
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-106

Bar Measures 1 inch

7/15/2020 7:08:59 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-106 US 41 PLAN AND PROFILE.DWG - CYR, STEVE





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10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	FDOT COMMENT 05/28/2020	

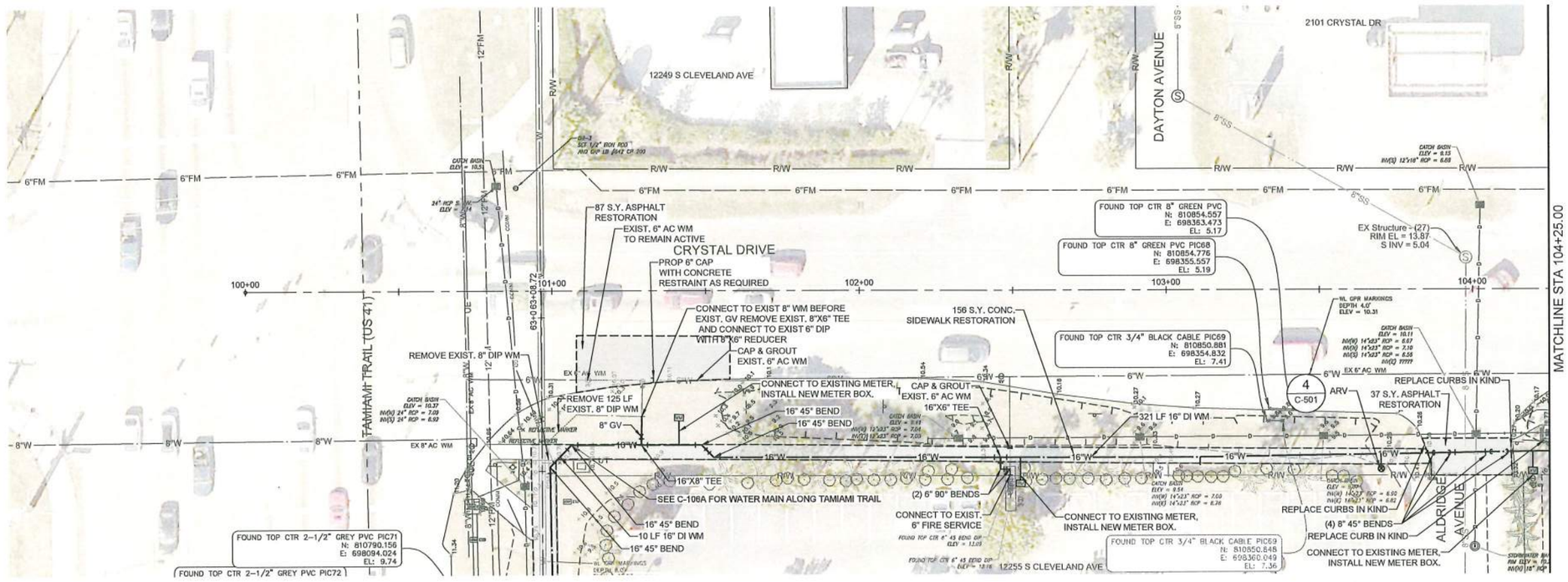
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
TAMIAMI TRAIL (US 41)
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

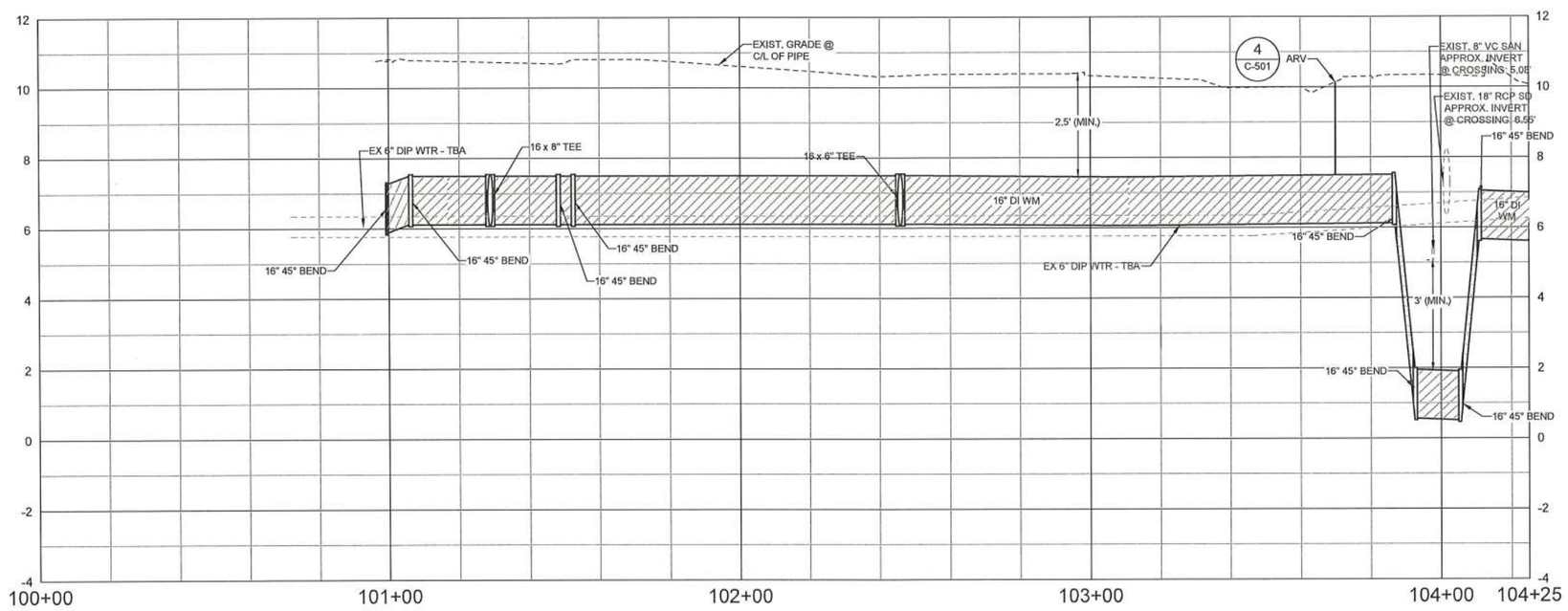
C-106A

Bar Measures 1 Inch

7/15/2020 7:12:15 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-106A US 41 PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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LICENSE #68512
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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

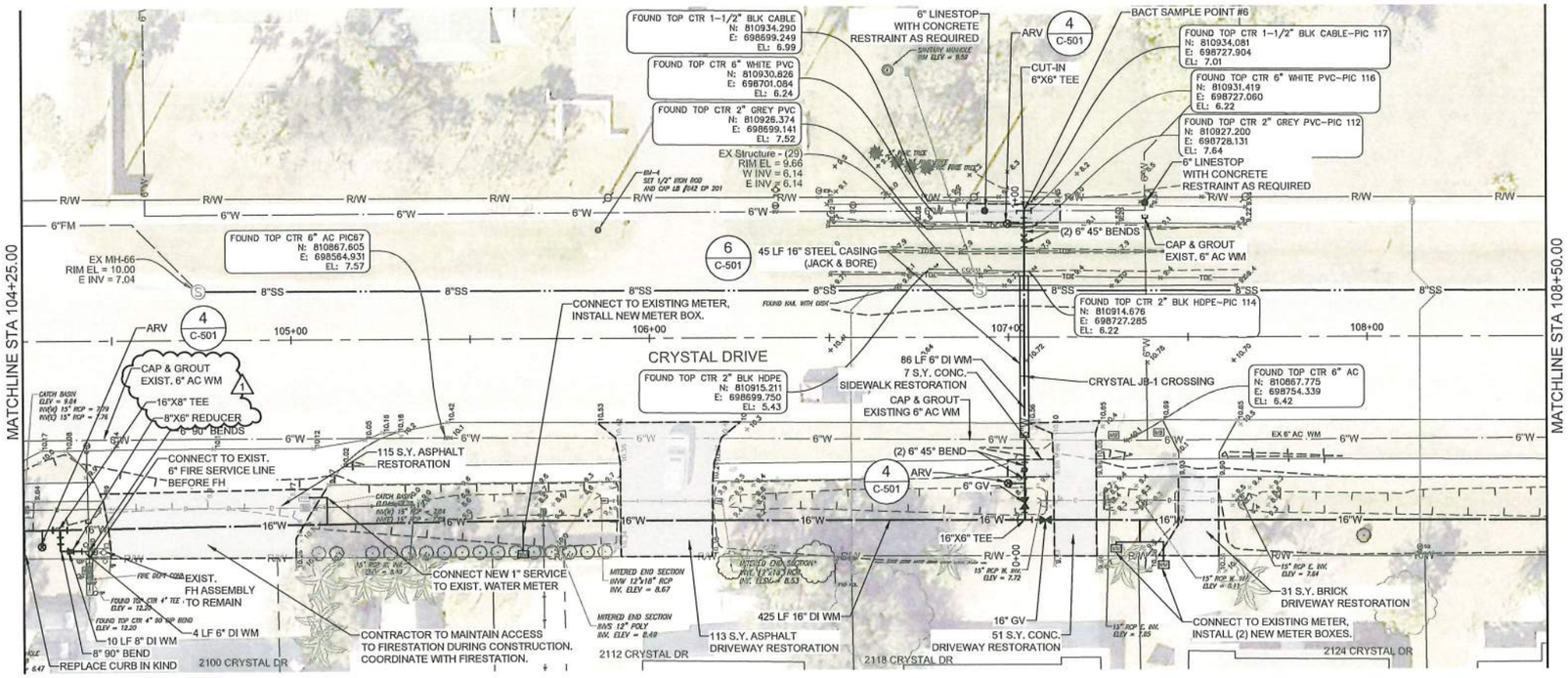
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

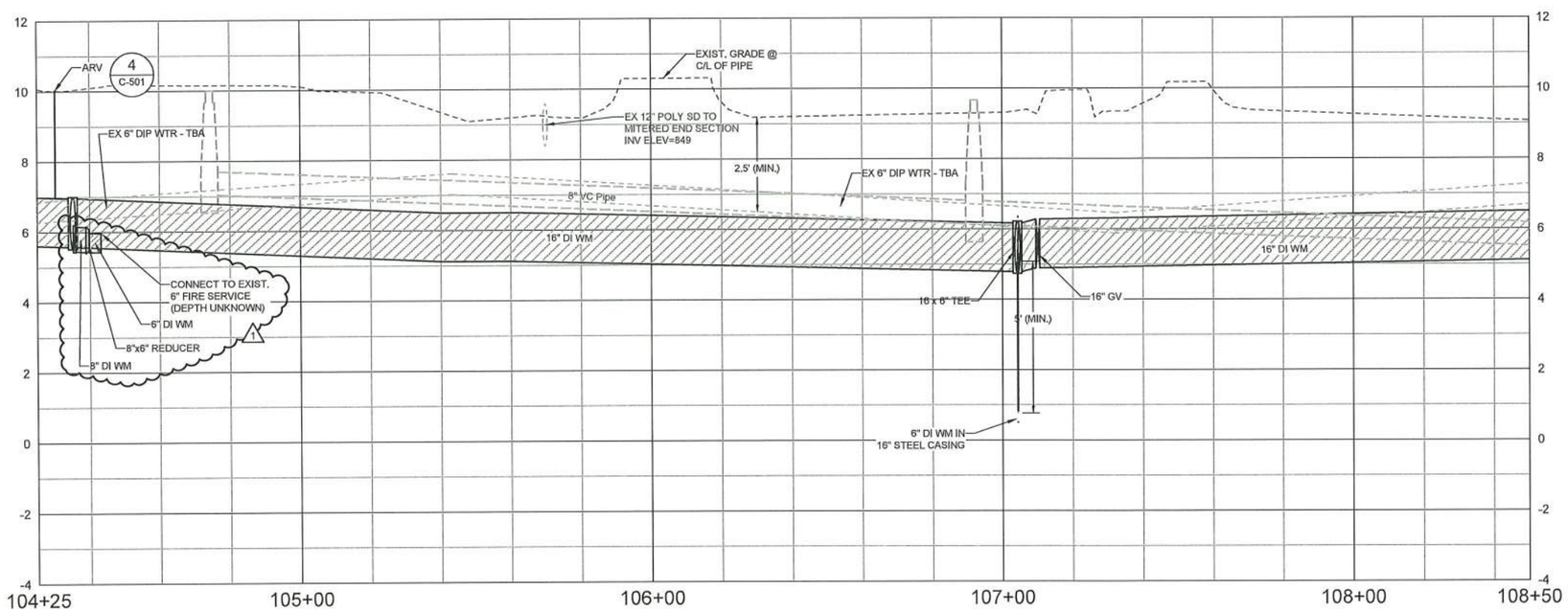
C-107

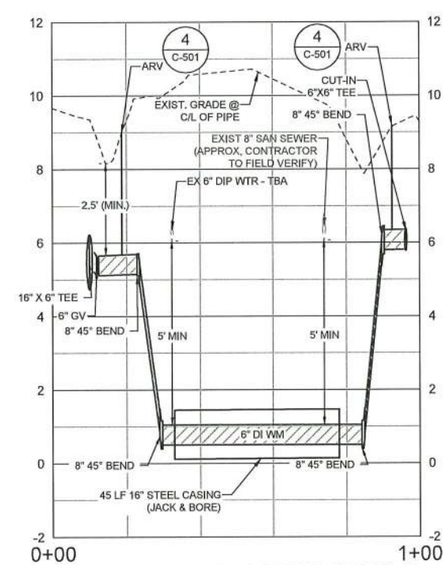
Bar Measures 1 inch

7/15/2020 7:15:26 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-107 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'





CRYSTAL JB-1 CROSSING PROFILE

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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	LDO COMMENT 06/16/2020	

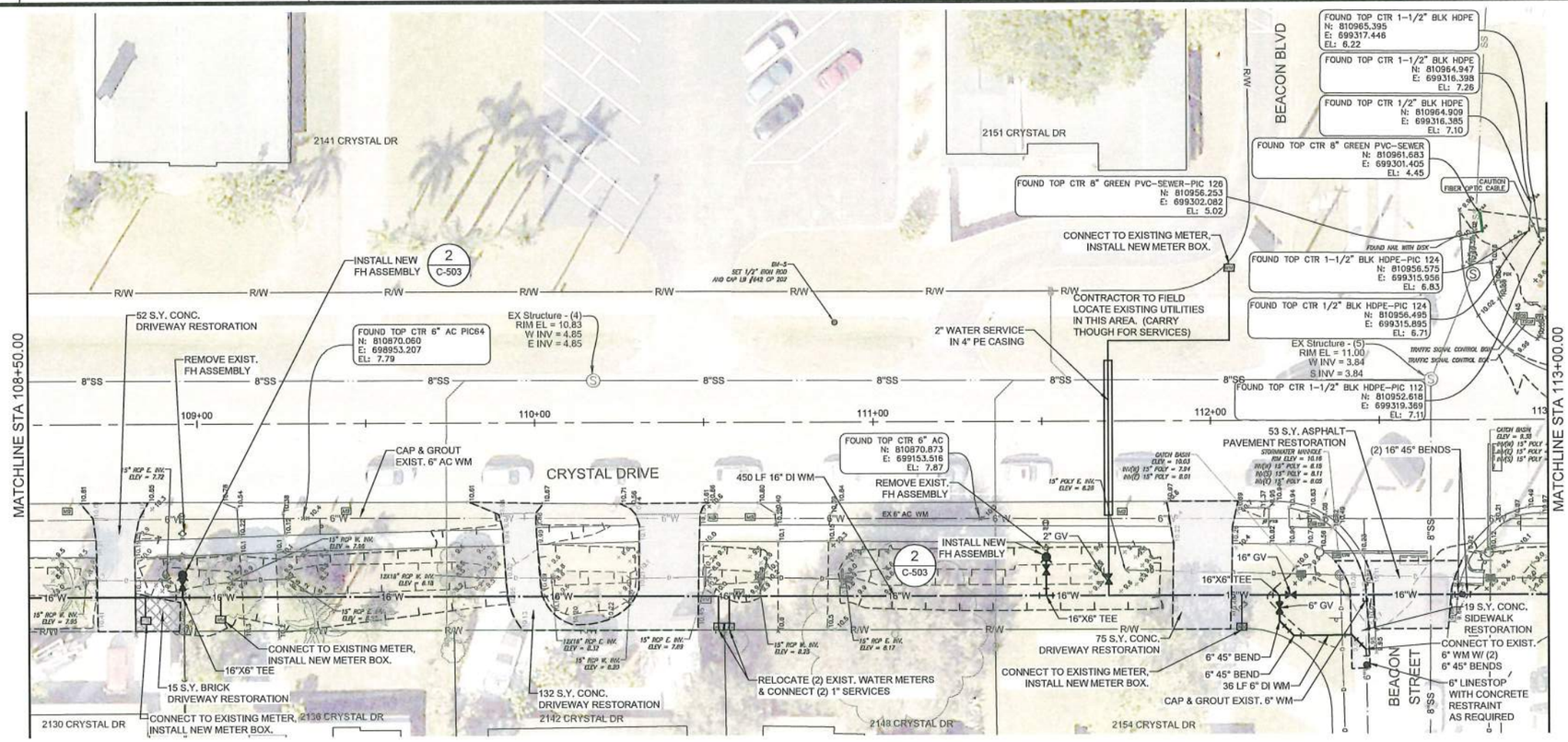
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

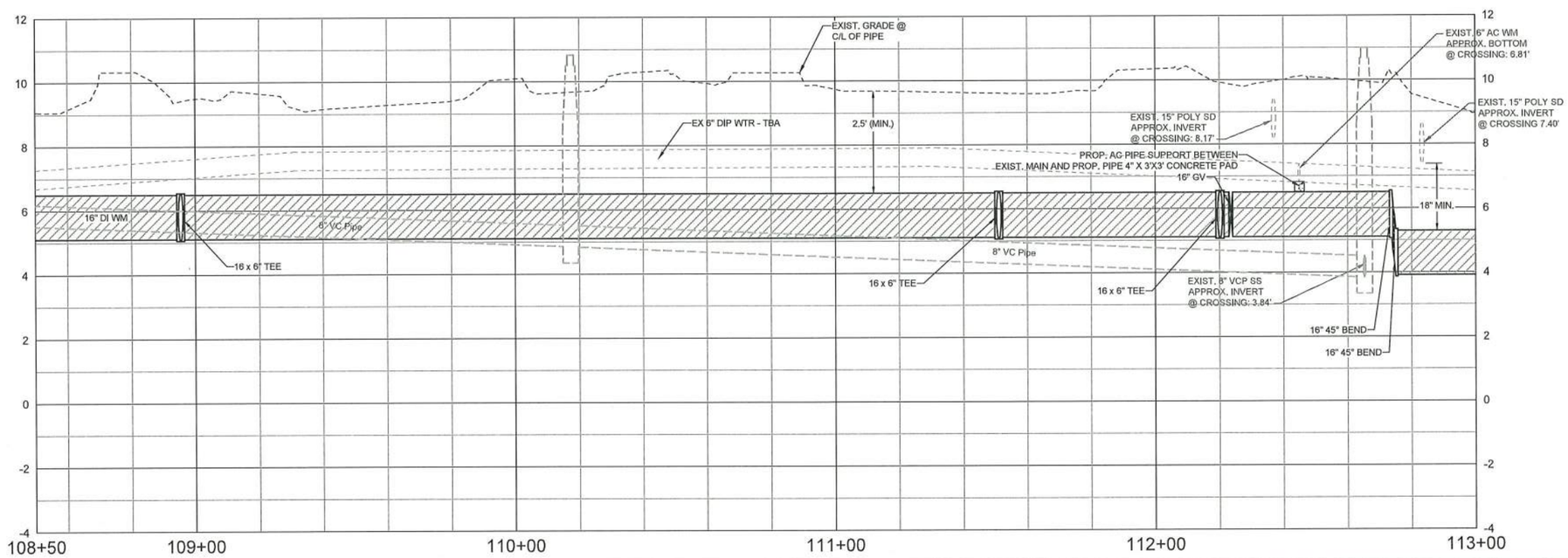
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-108

Bar Measures 1 inch

7/15/2020 7:18:42 PM - O:\PROJECTS\ORLAND\OIER\01558\200-01558-19001\CAD\SHEETFILES\C-108 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

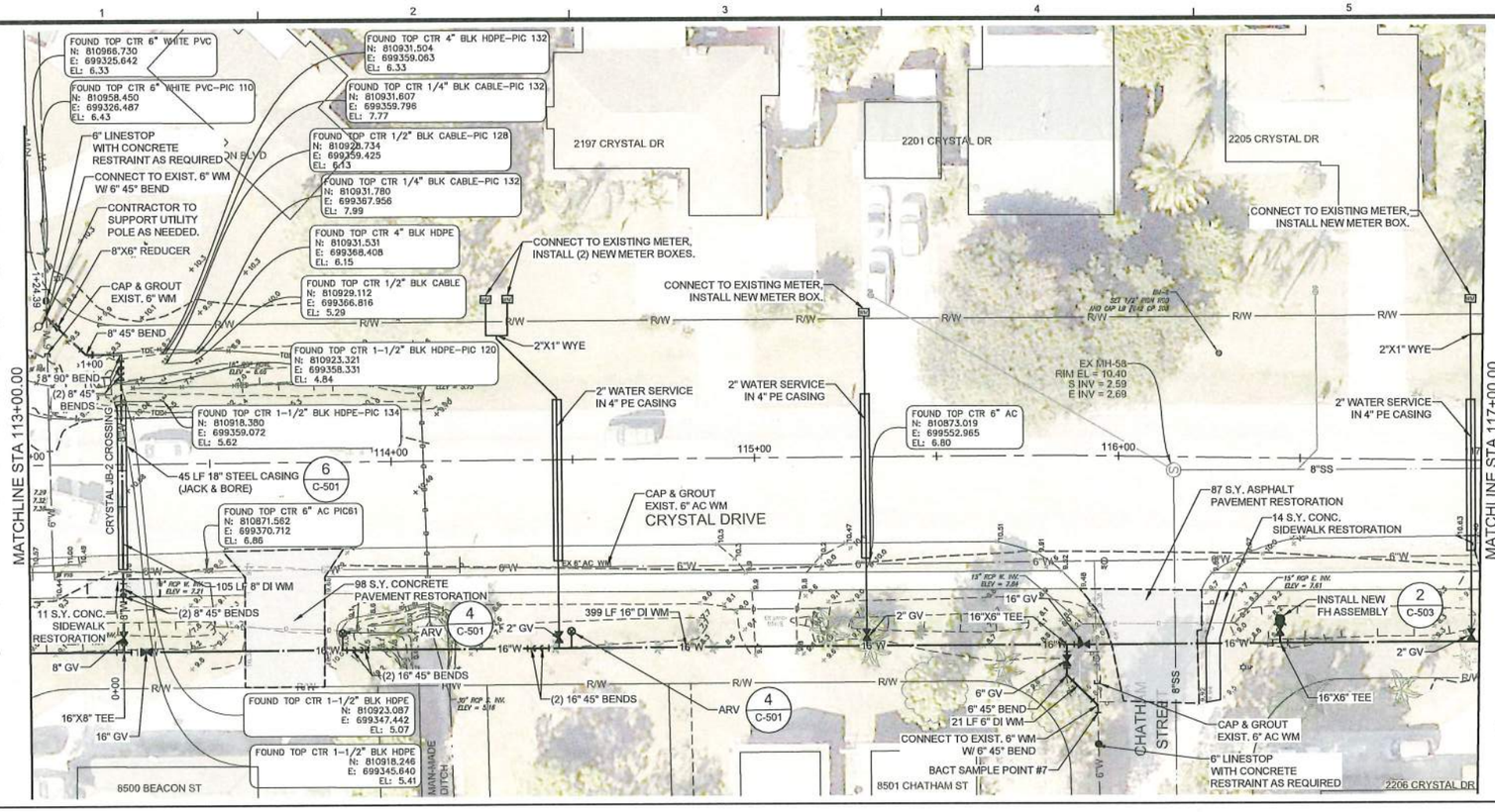
CRYSTAL DRIVE PLAN AND PROFILE

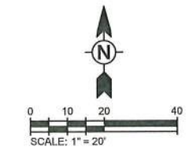
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-109

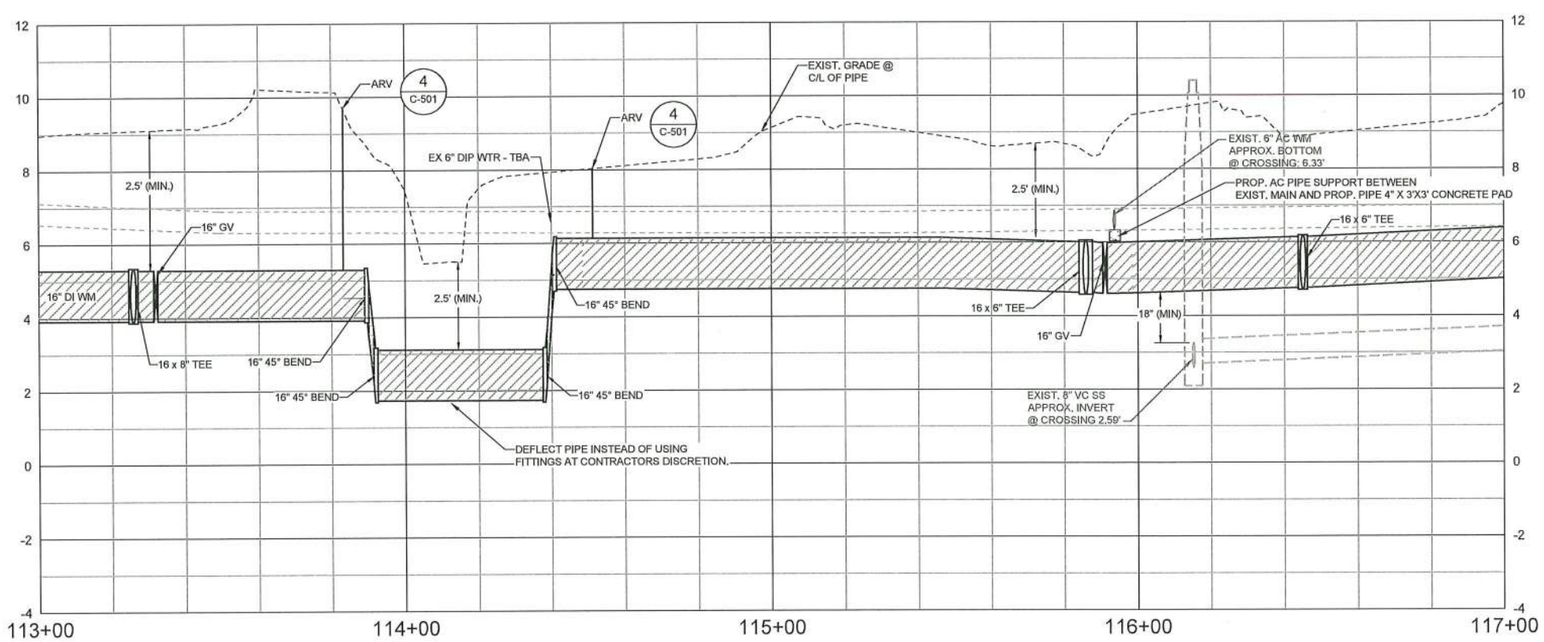
Bar Measures 1 inch

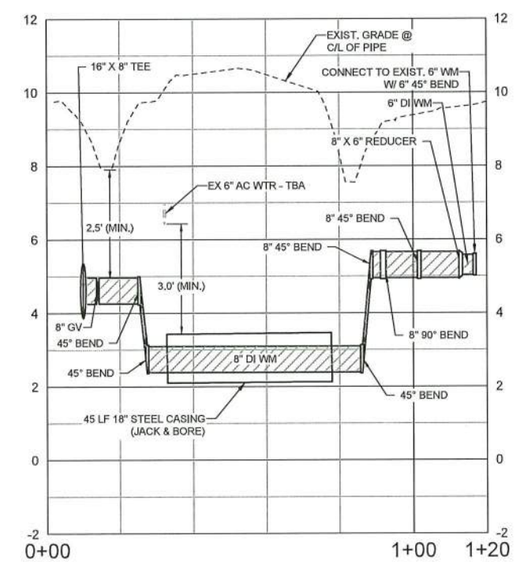
7/15/2020 7:22:12 PM - O:\PROJECTS\ORLANDO\VER\01558\200-01558-19001\CAD\SHEETFILES\C-109 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1" = 20'
VERT. 1" = 2'





CRYSTAL JB-2 CROSSING PROFILE

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LICENSE #68612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

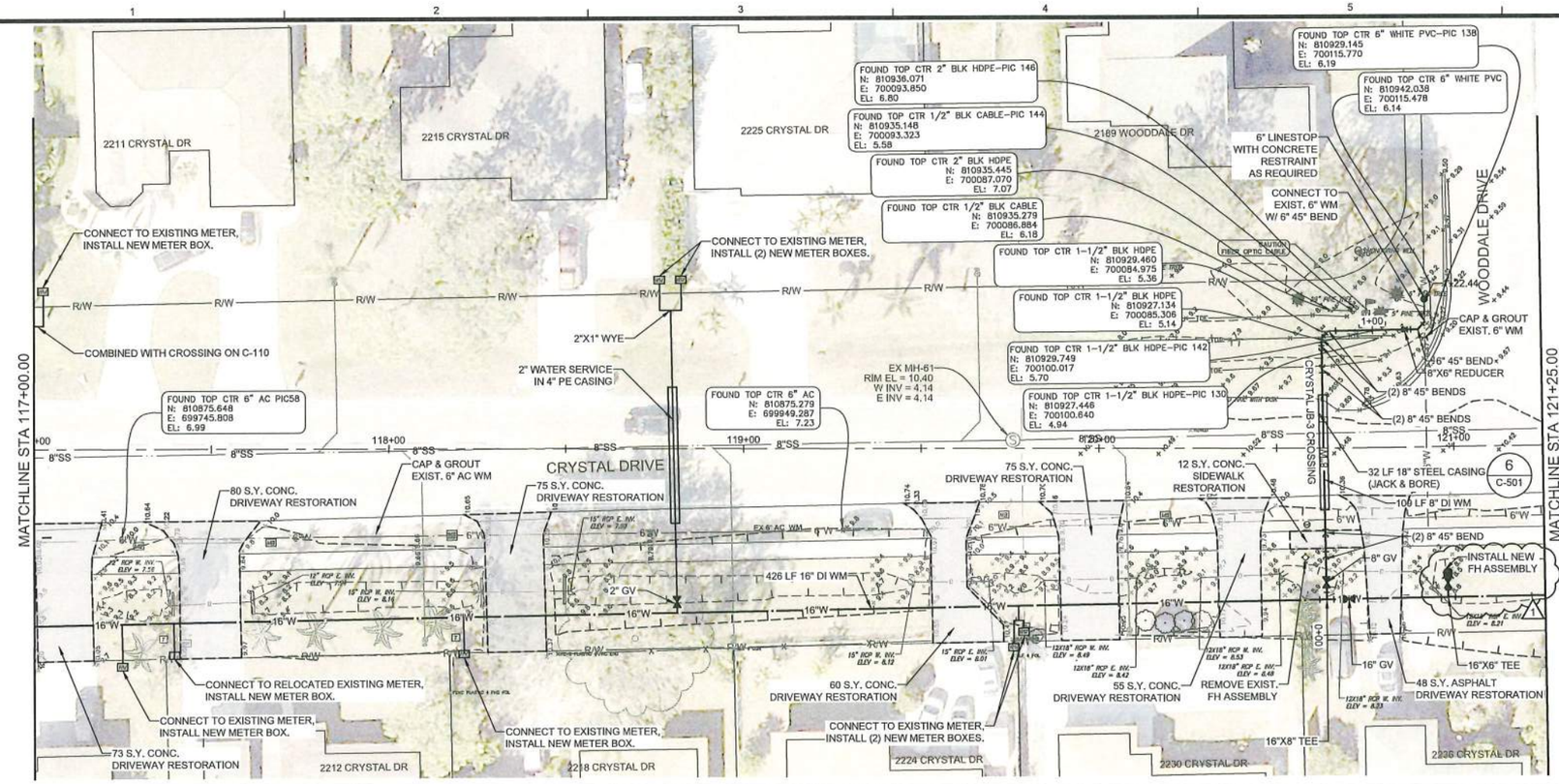
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

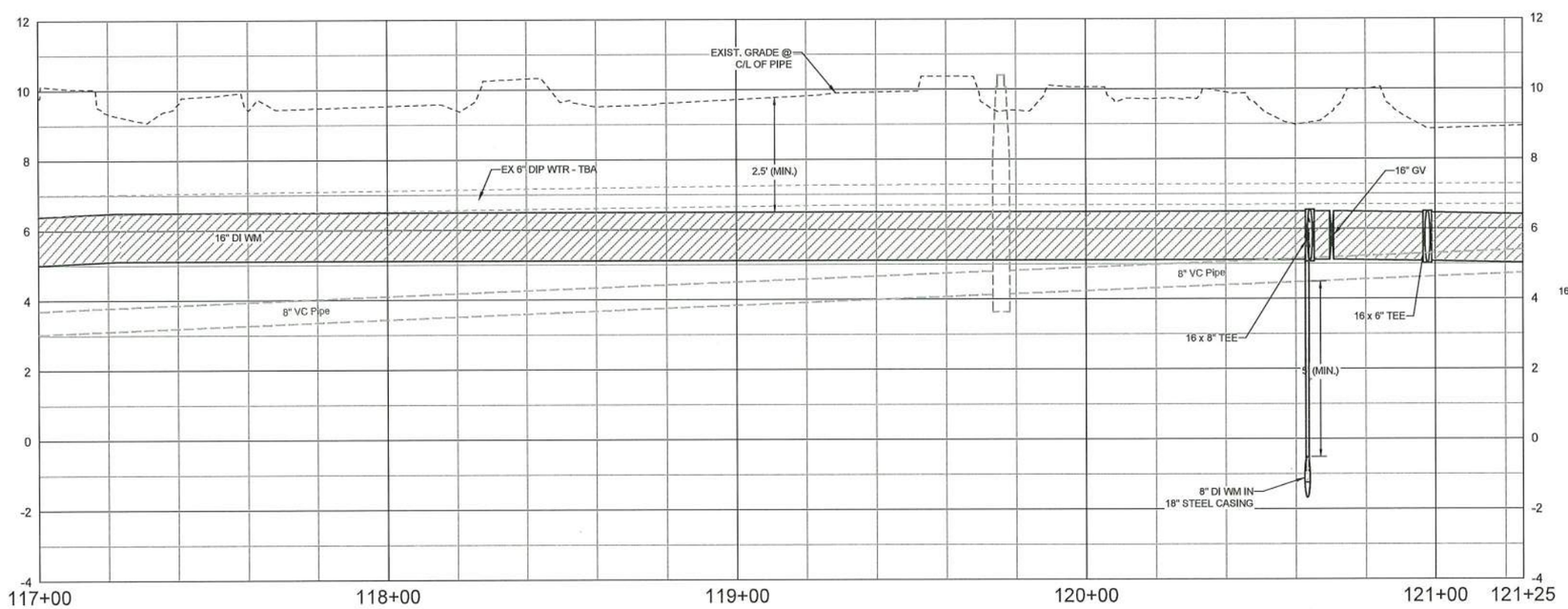
C-110

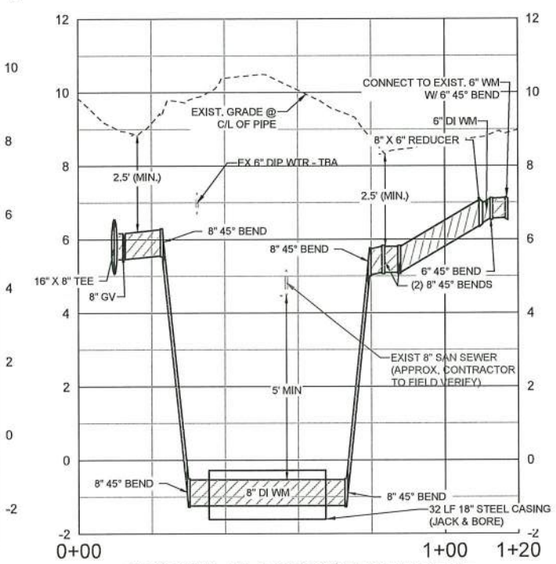
Bar Measures 1 inch

7/15/2020 7:25:40 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-110 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'





CRYSTAL JB-3 CROSSING PROFILE

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Estero, FL 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	LDO COMMENT 06/16/2020	

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

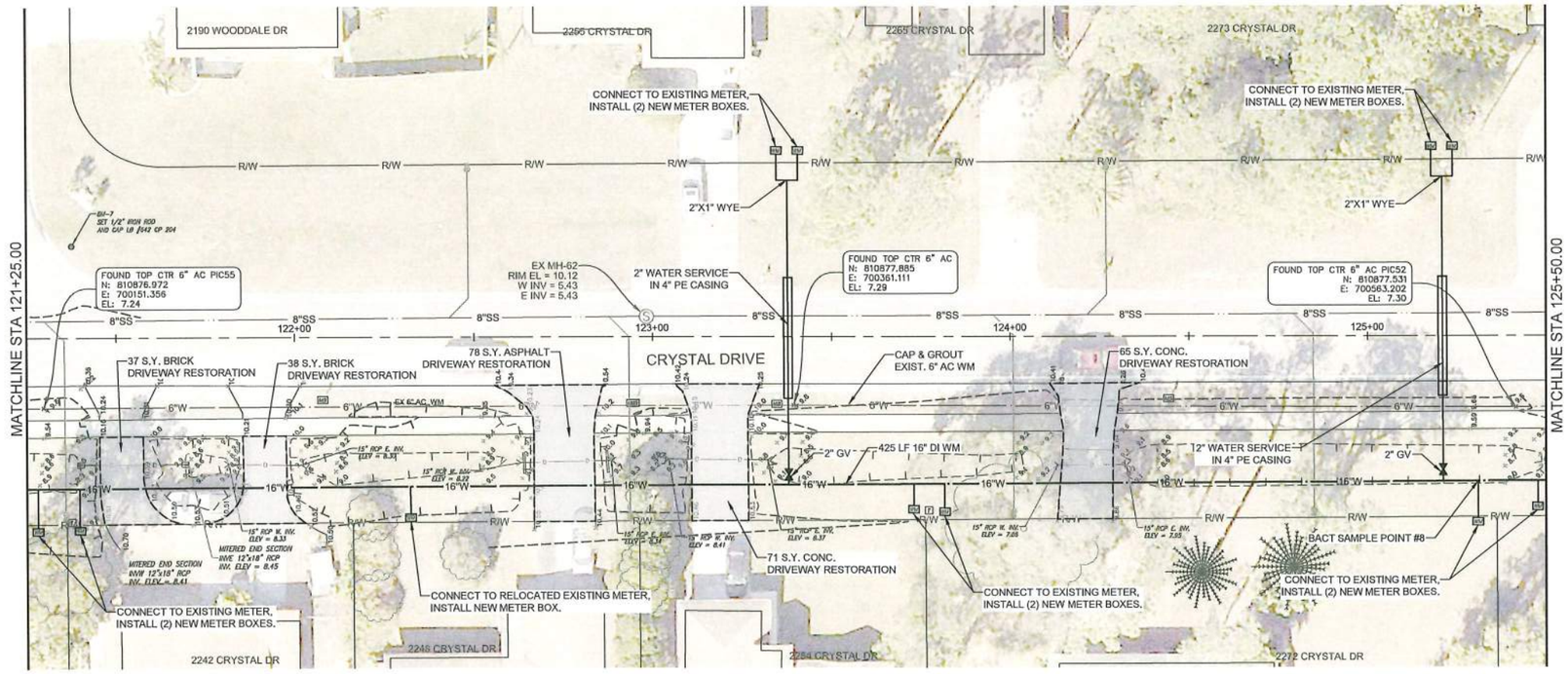
CRYSTAL DRIVE PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-111

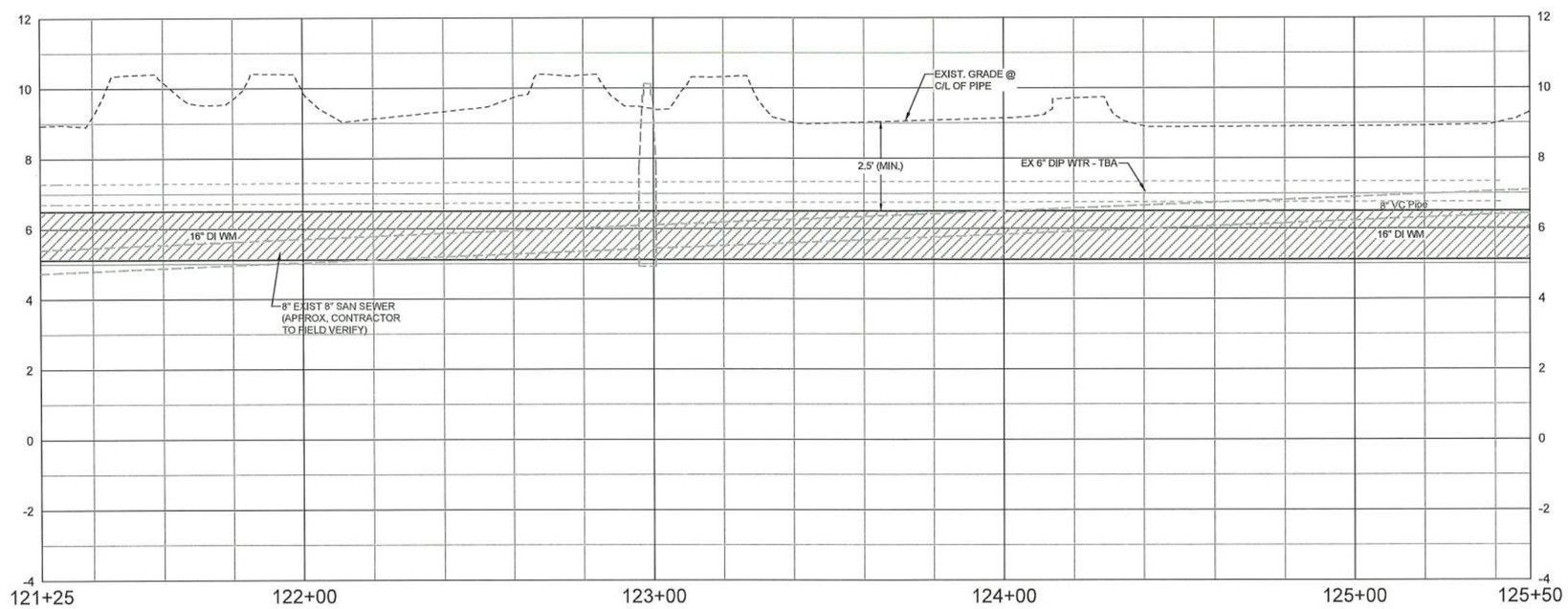
Bar Measures 1 inch

7/15/2020 7:29:38 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-111 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE: 1" = 20'

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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LICENSE #68612
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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES

CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

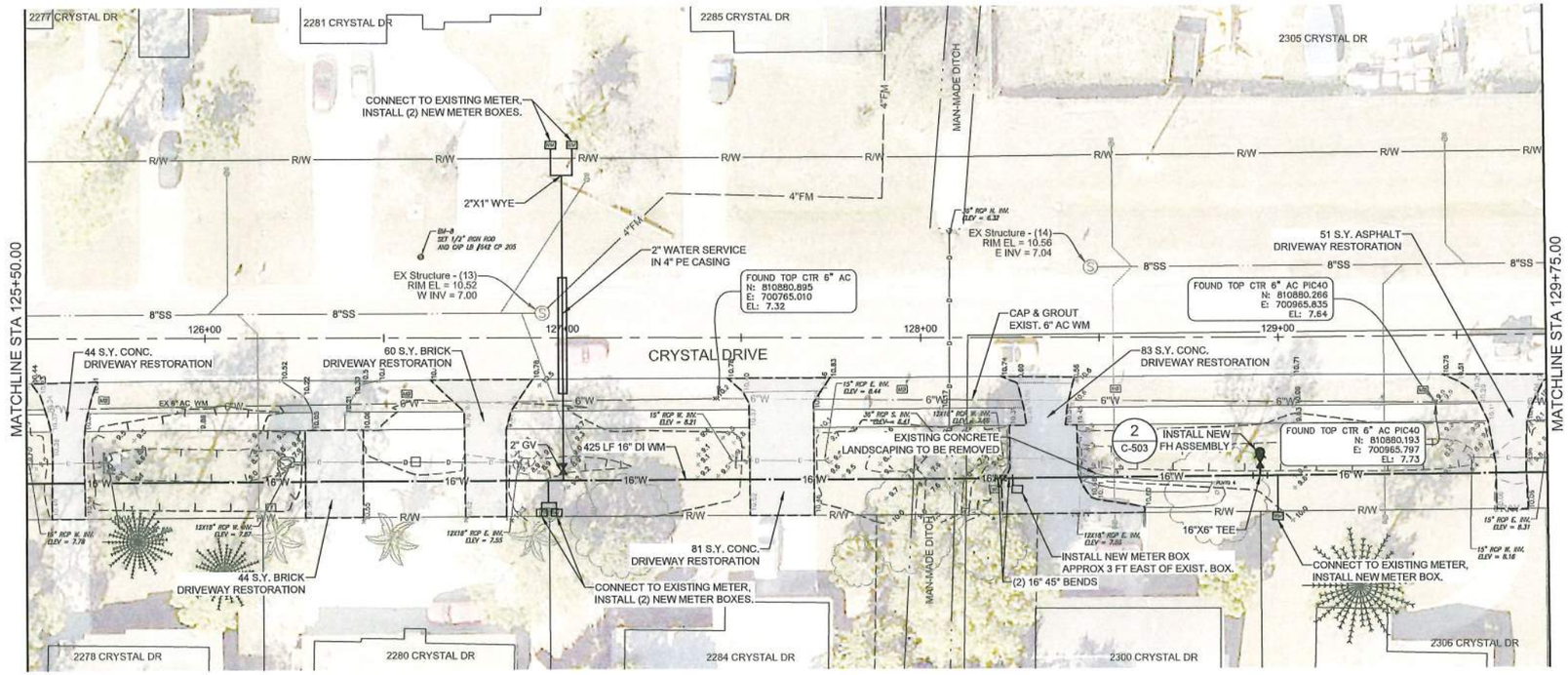
CRYSTAL DRIVE PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

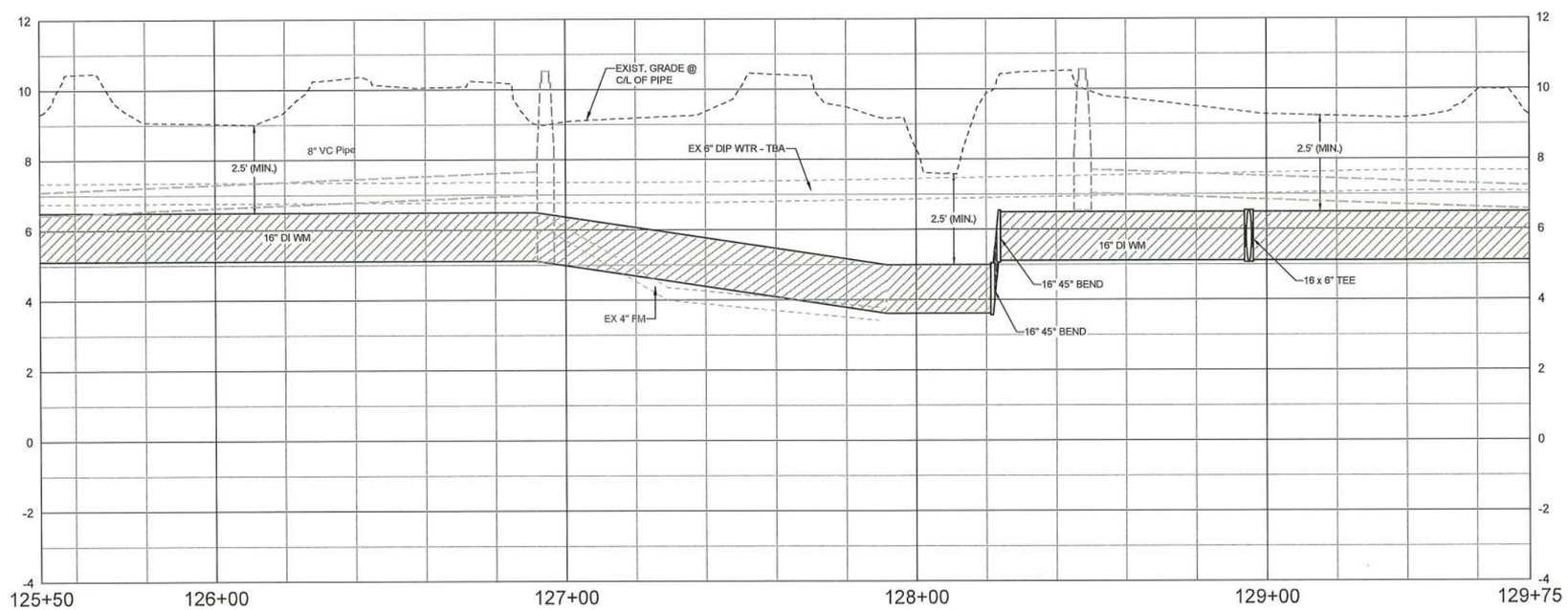
C-112

Bar Measures 1 Inch

7/15/2020 7:32:39 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-112 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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Estero, Florida 33928
Engineering Business No. 2429

MARK	DATE	DESCRIPTION	BY

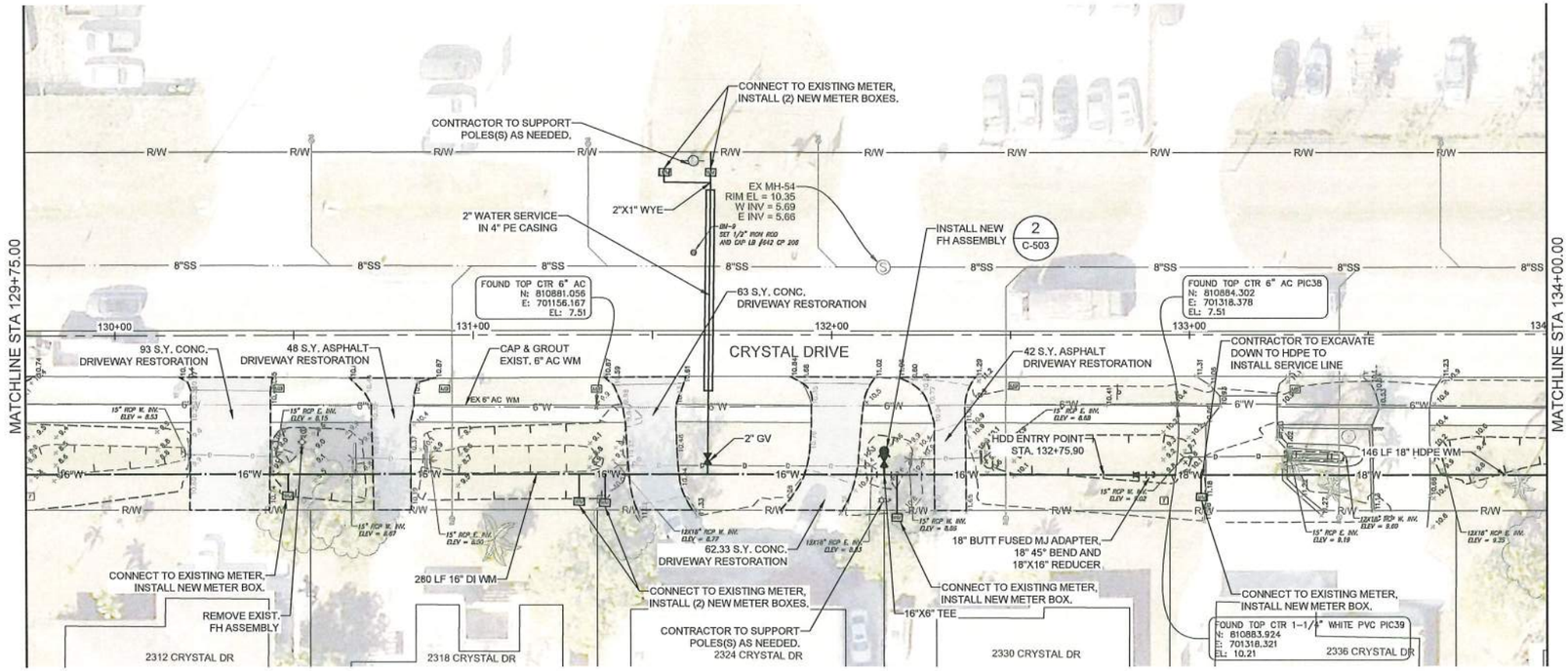
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-113

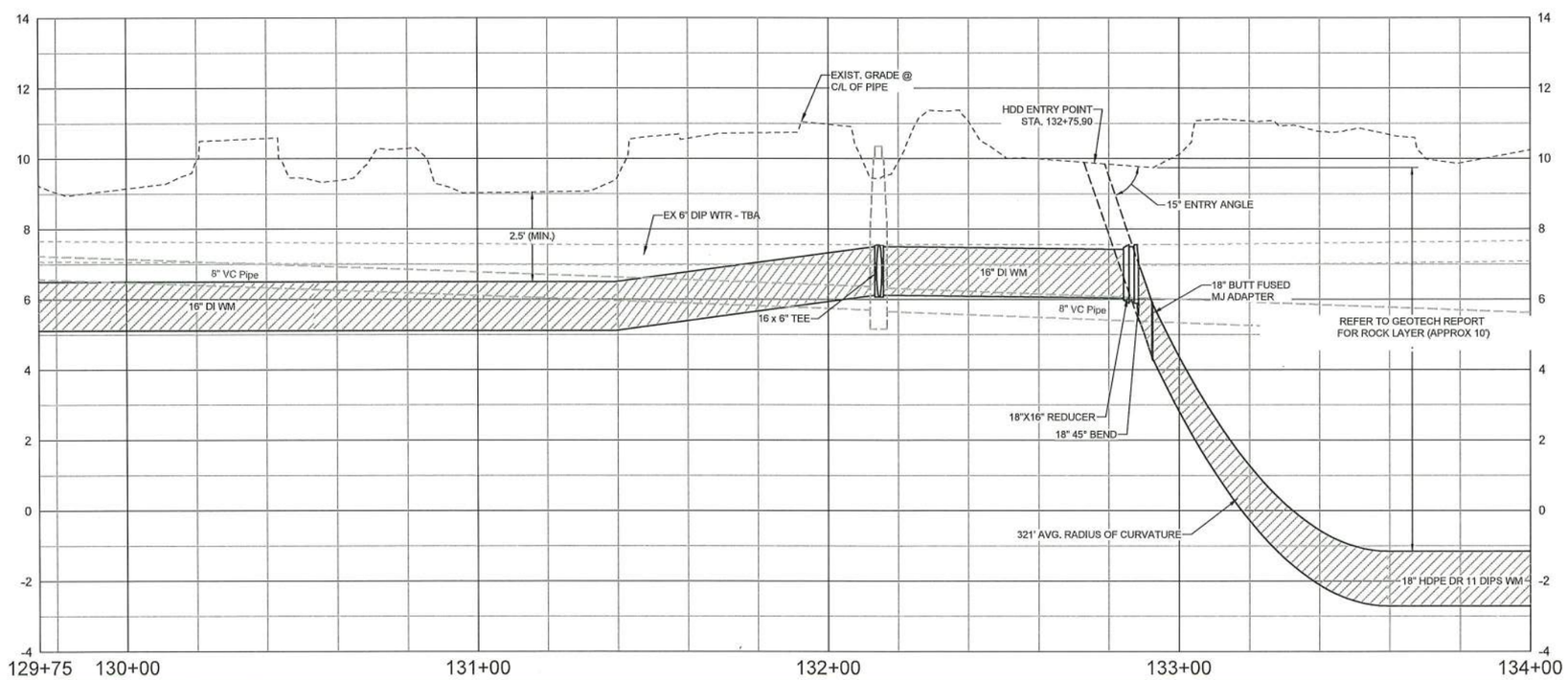
Bar Measures 1 Inch

7/15/2020 7:35:50 PM - O:\PROJECTS\ORLANDOVIER\01558\200-01558-19001\CAD\SHEETFILES\C-113 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



0 10 20 40
SCALE: 1" = 20'

SCALE:
HORIZ. 1" = 20'
VERT. 1" = 2'



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LICENSE #88912
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

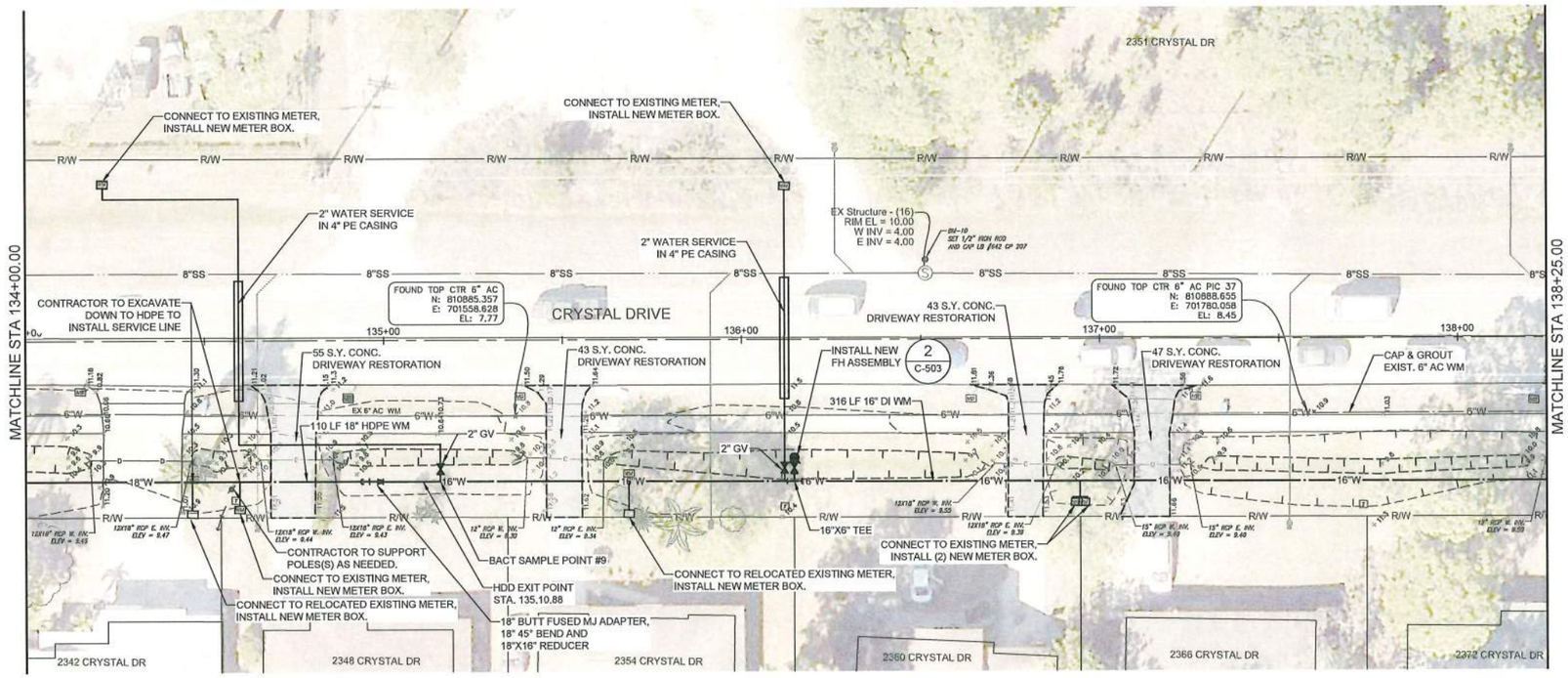
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-114

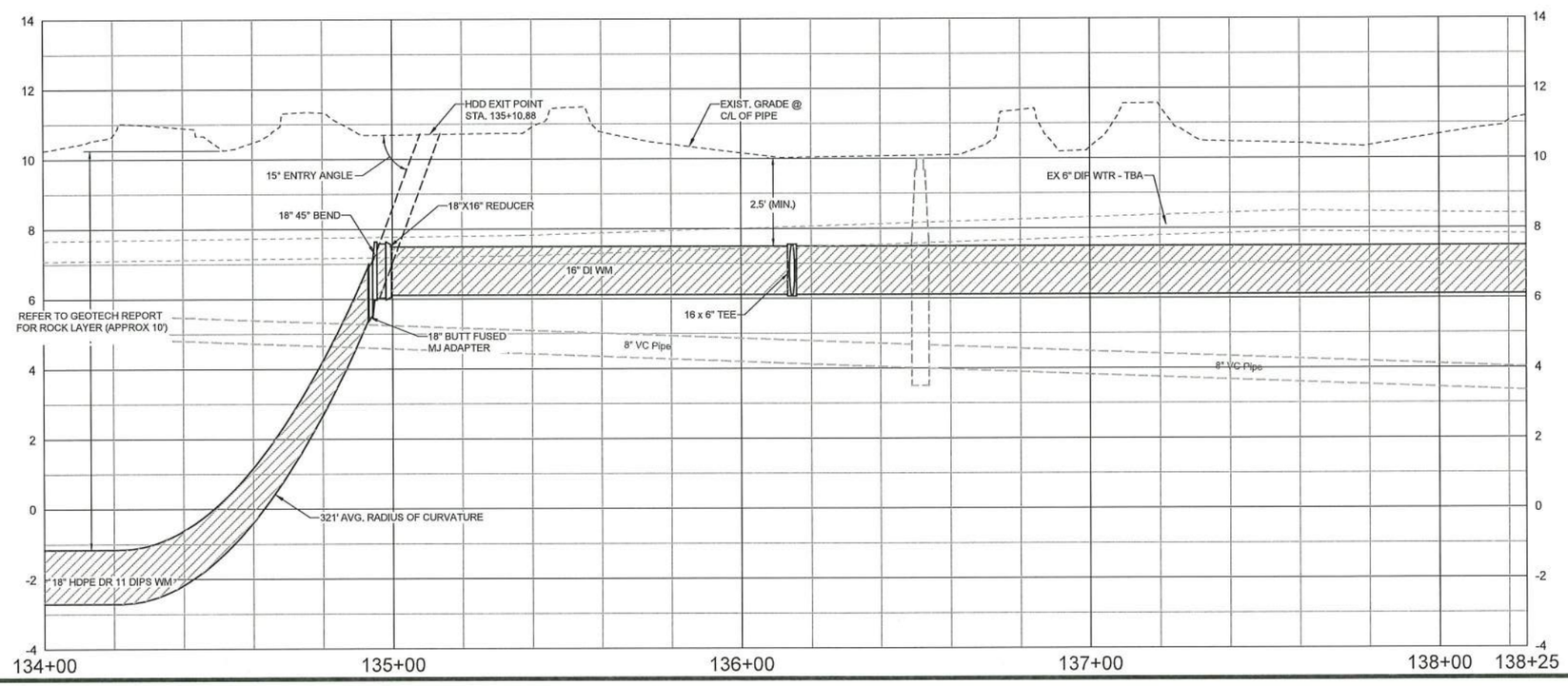
Bar Measures 1 inch

7/15/2020 7:38:51 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-114 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE: 1" = 20'

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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LICENSE #68612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

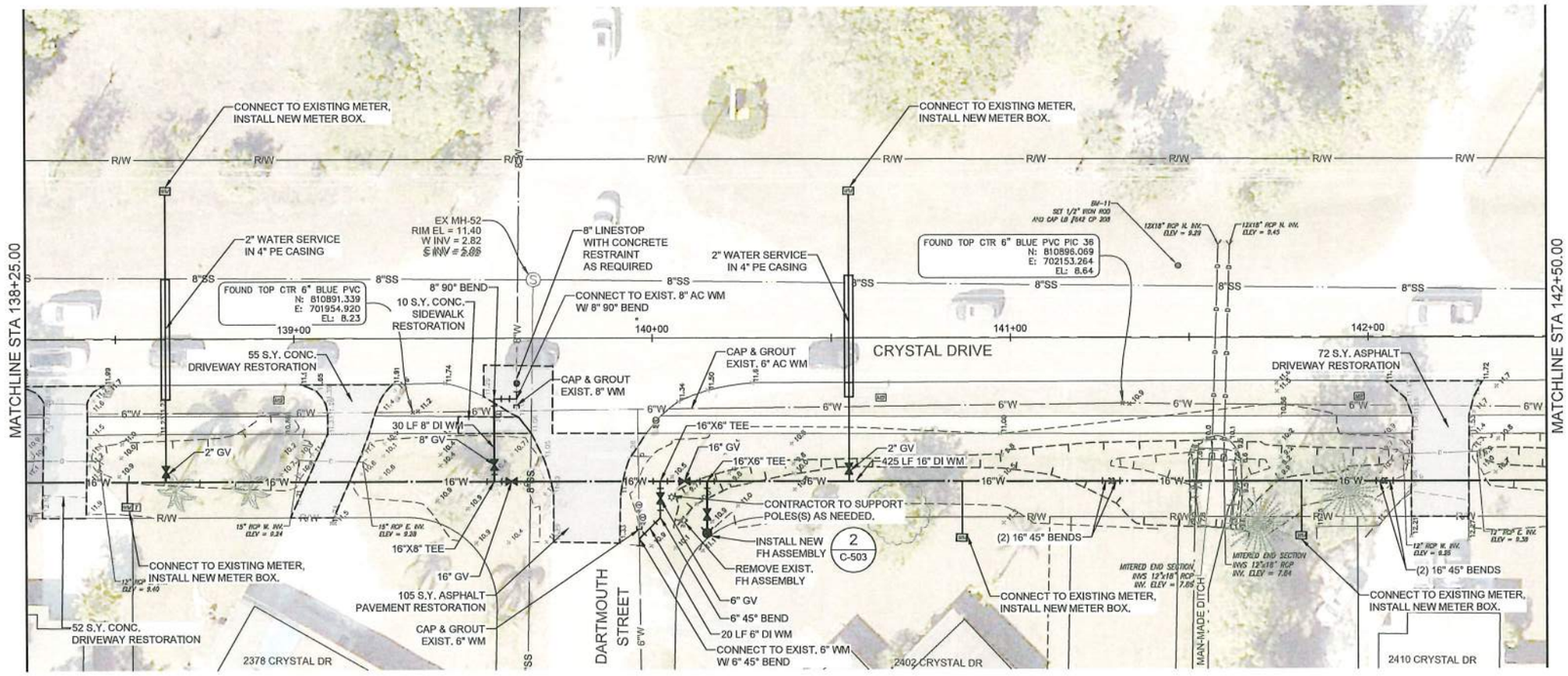
CRYSTAL DRIVE PLAN AND PROFILE

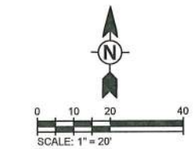
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-115

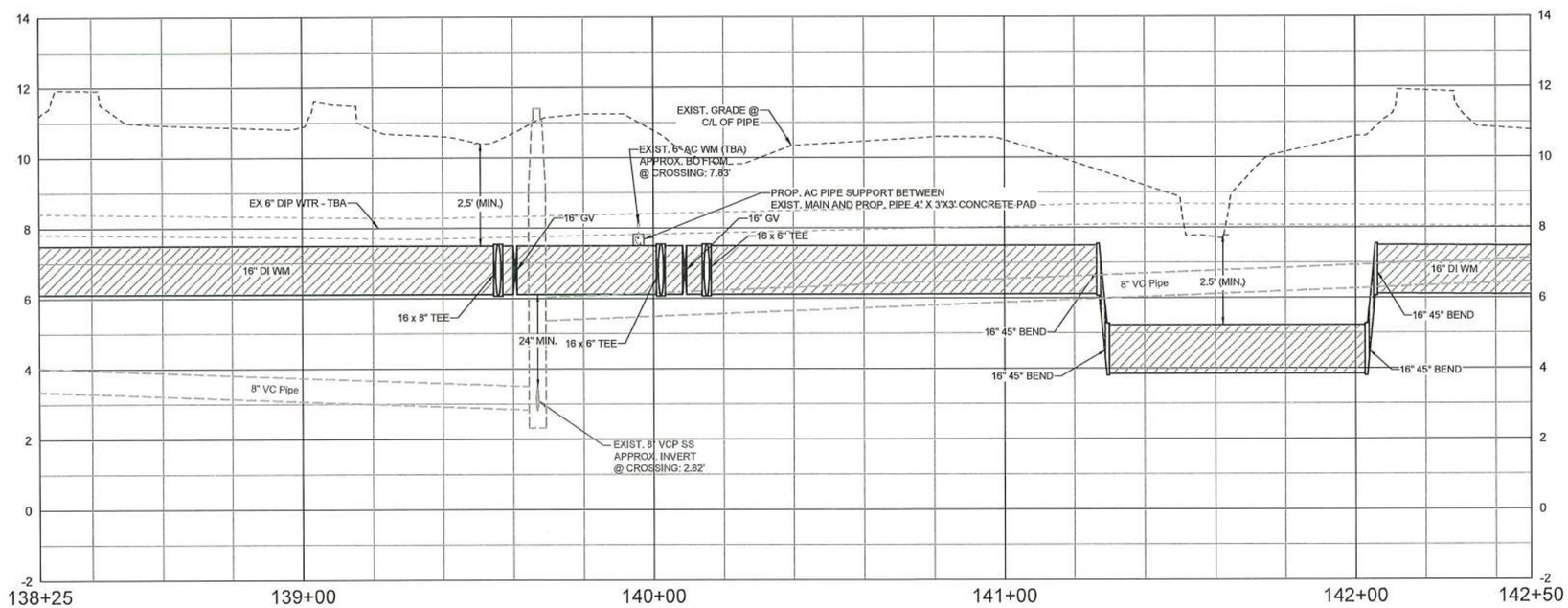
Bar Measures 1 Inch

7/15/2020 7:41:59 PM - O:\PROJECTS\ORLANDOVER\01558\200-01558-19001\CAD\SHEETFILES\C-115 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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STEVEN AGAPI, P.E.
LICENSE #89612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2409

DATE

MARK	DATE	DESCRIPTION	BY

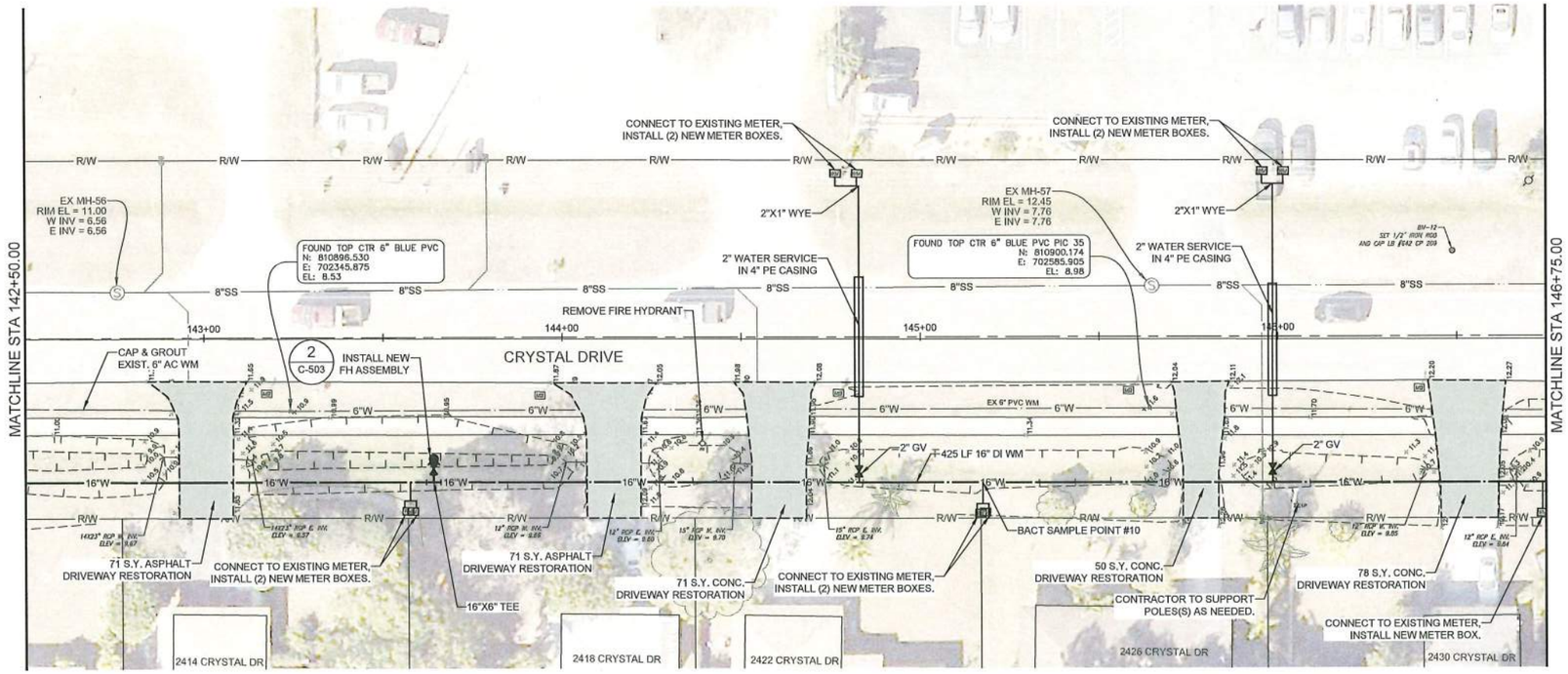
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

CRYSTAL DRIVE PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

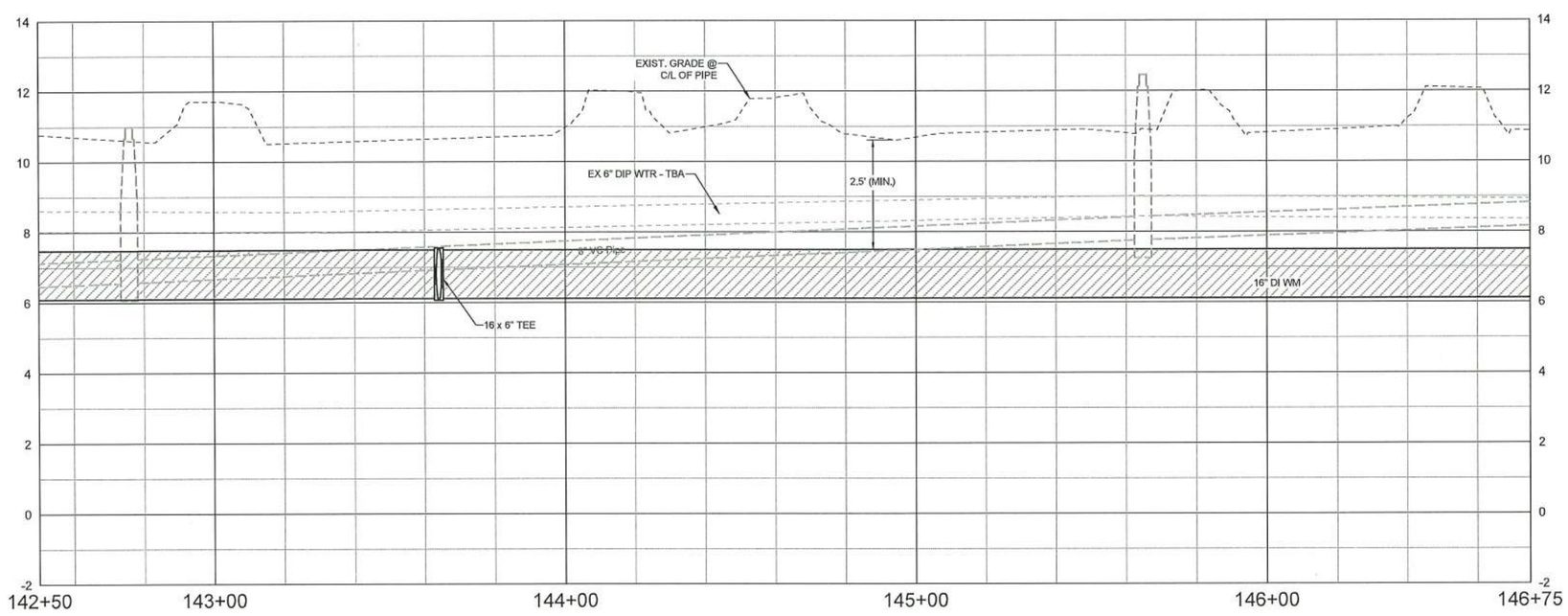
C-116

Bar Measures 1 Inch



SCALE: 1" = 20'

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



TETRA TECH
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10600 CHEVROLET WAY, SUITE 102
ESTERO, FL 33928
PHONE: (239) 390-1467 FAX: (407) 839-3790

STEVEN AGAPI, P.E.
LICENSE #88612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

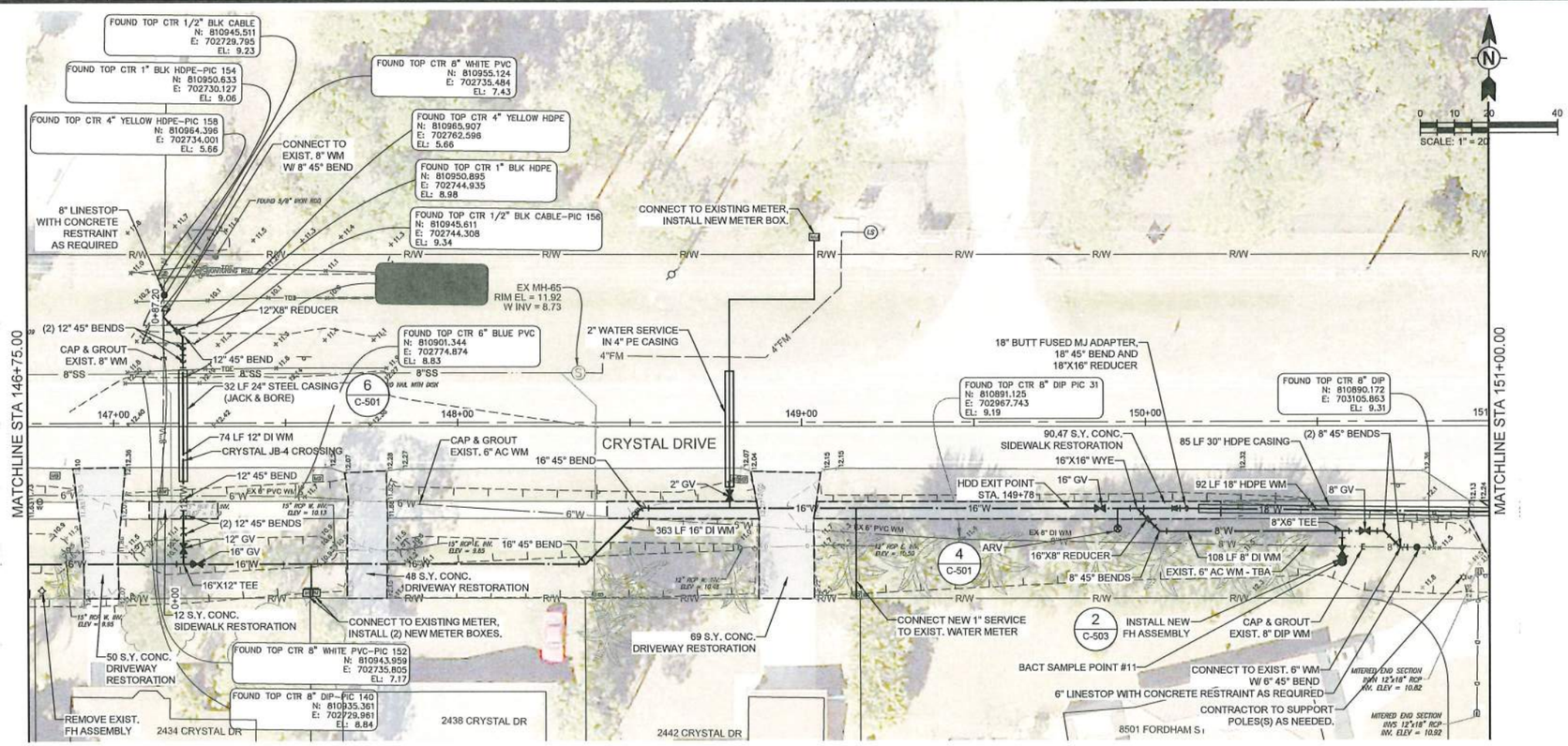
CRYSTAL DRIVE PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

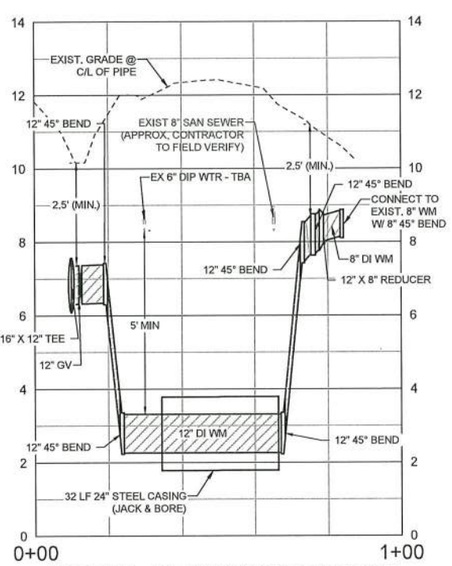
C-117

Bar Measures 1 inch

7/15/2020 8:50:20 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-117 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE

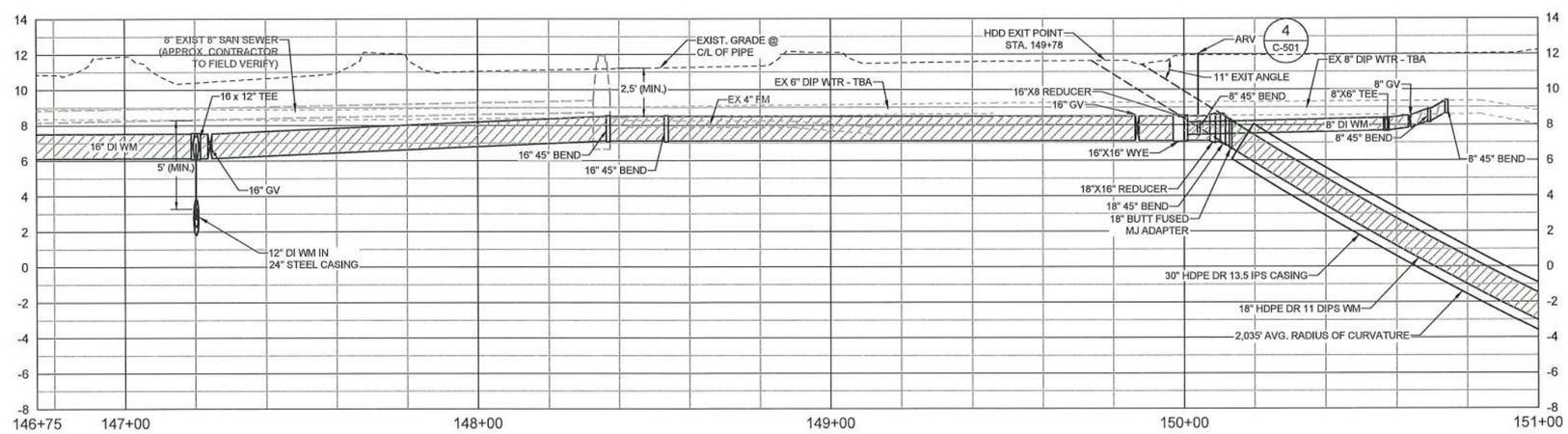


SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



CRYSTAL JB-4 CROSSING PROFILE

SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'



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Estero, Florida 33928
Engineering Business No. 2429

MARK	DATE	DESCRIPTION	BY

DATE

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

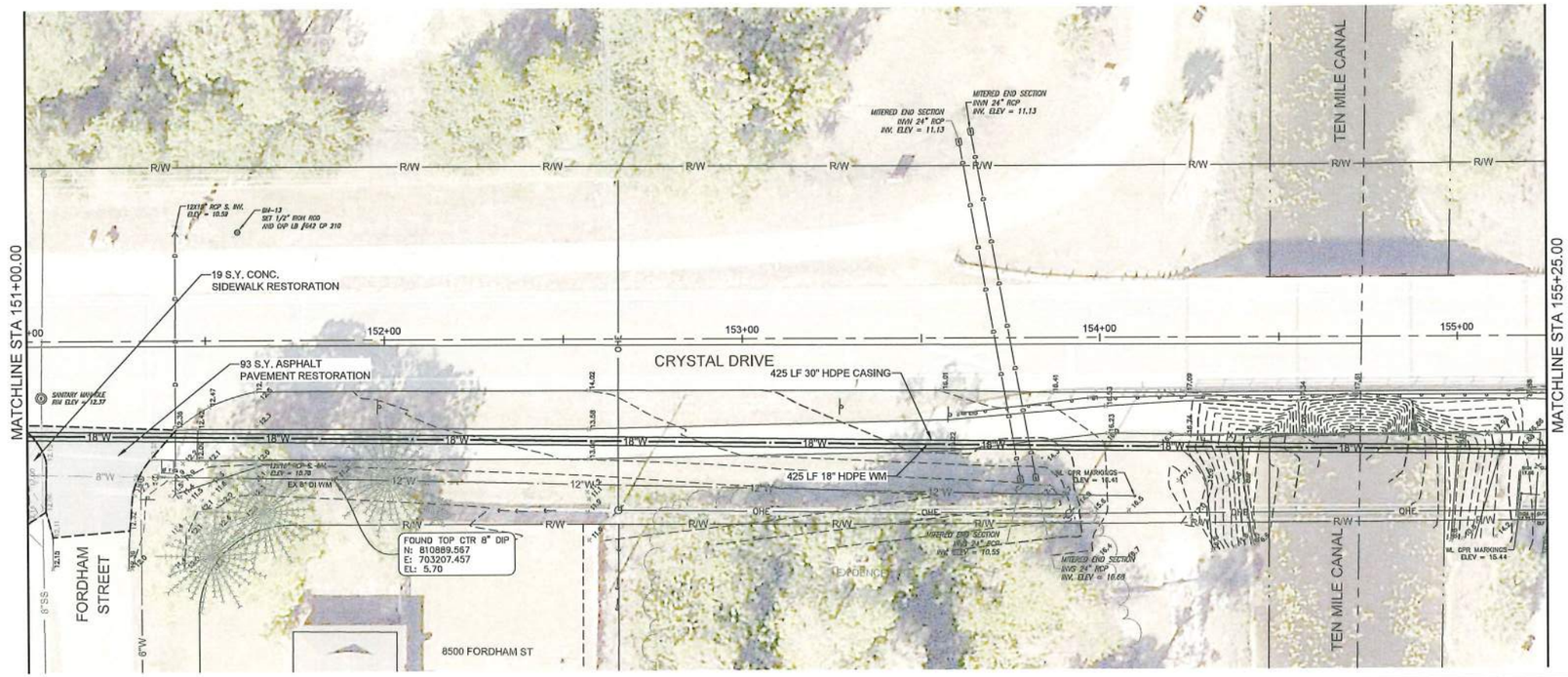
CRYSTAL DRIVE PLAN AND PROFILE

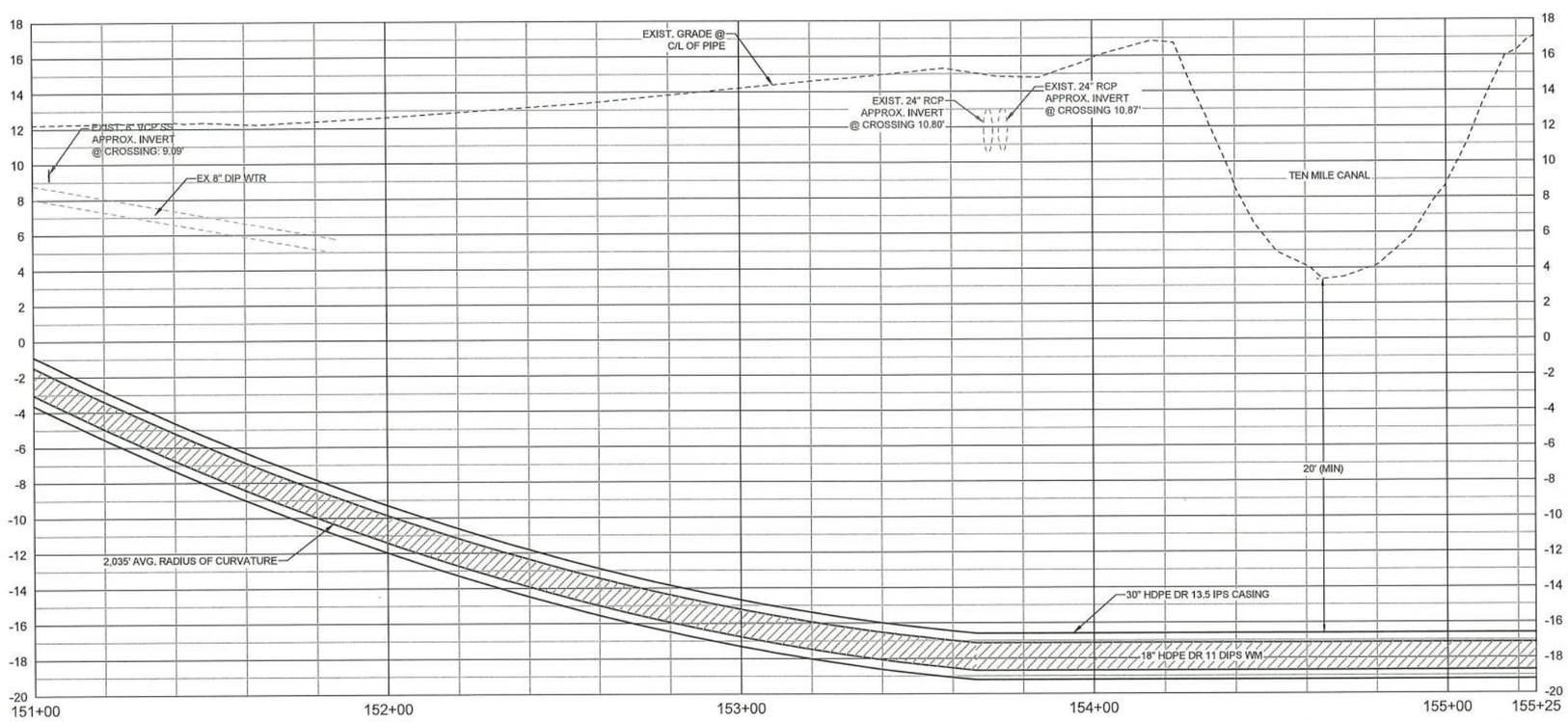
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-118

Bar Measures 1 Inch

7/15/2020 7:50:31 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-118 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

SCALE: 1" = 20'

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LICENSE #88612
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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

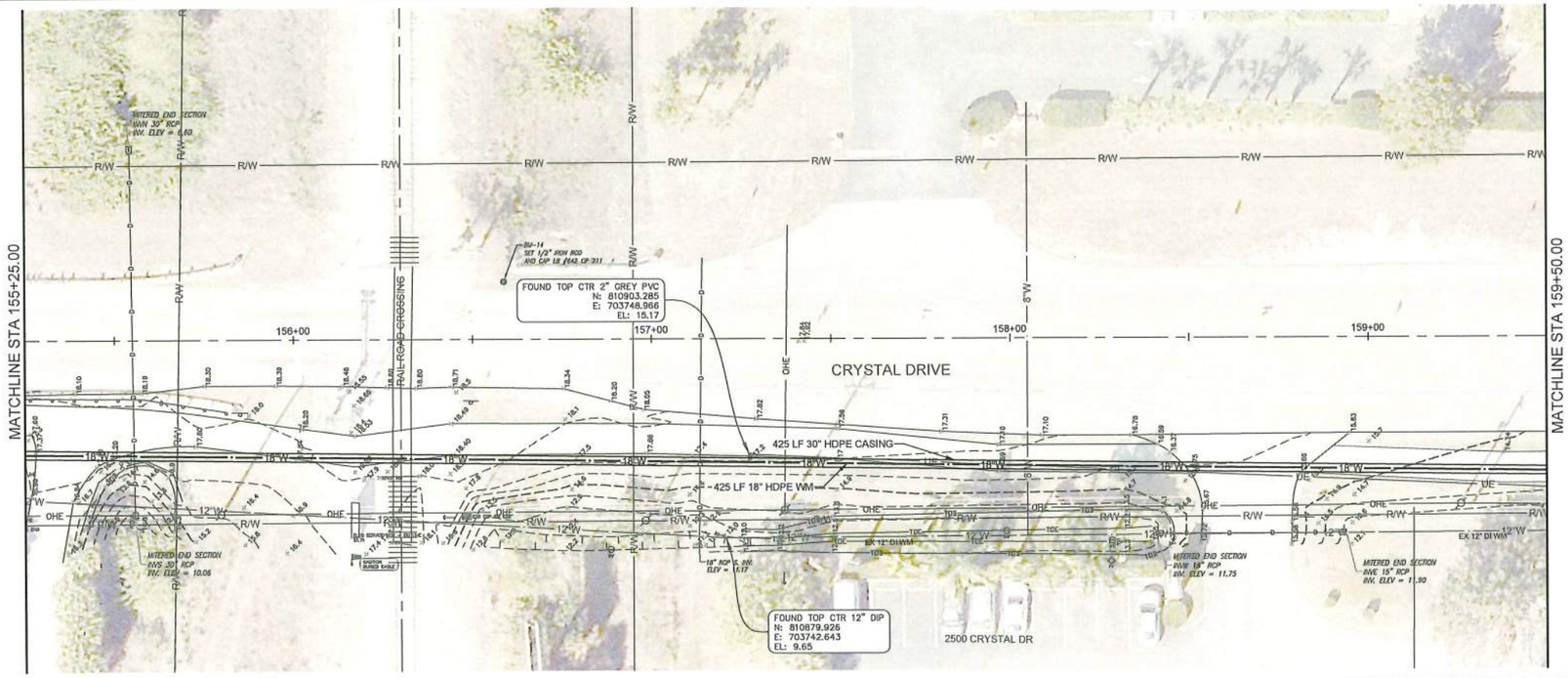
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

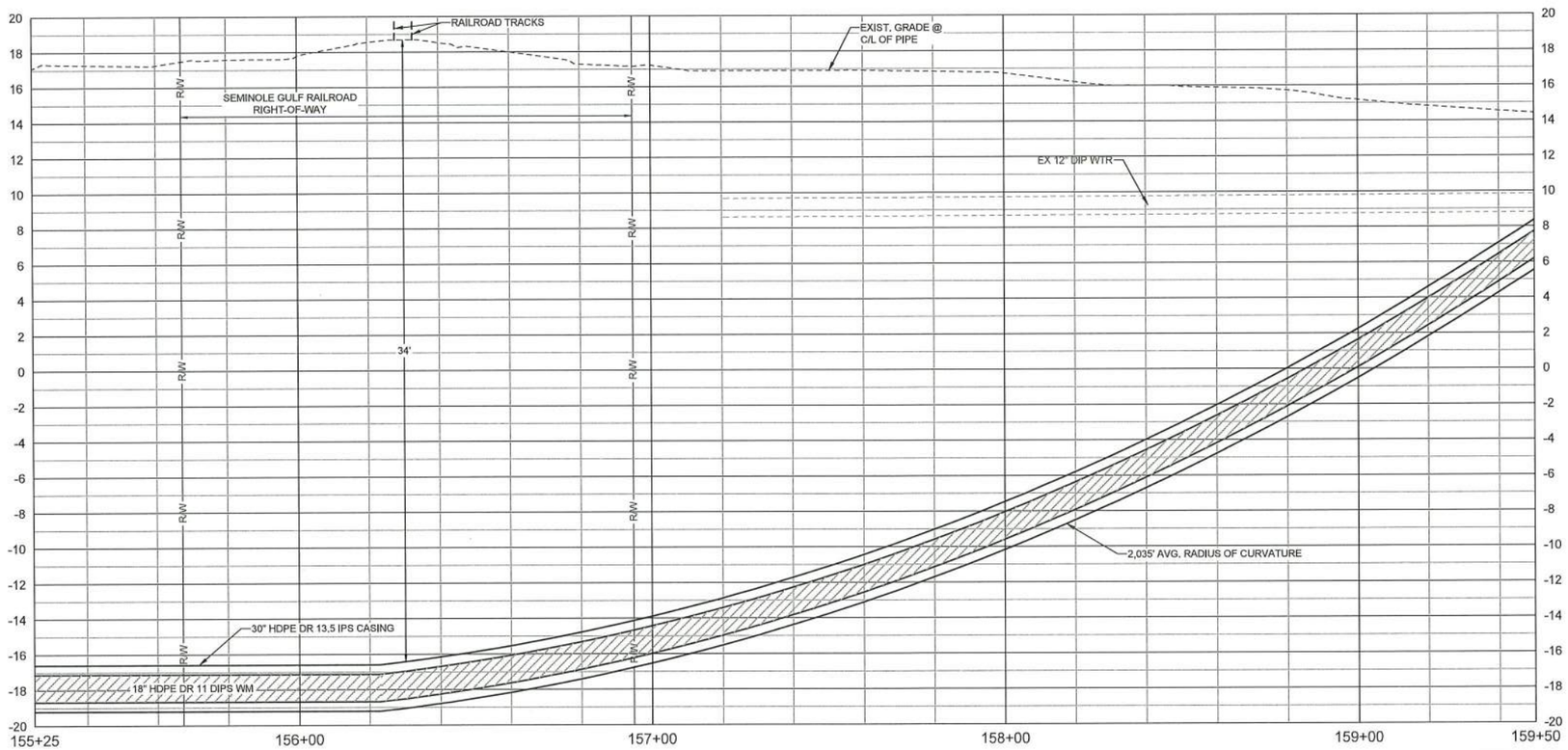
C-119

Bar Measures 1 inch

7/15/2020 7:53:39 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-119 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE: 1" = 20'



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

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LICENSE #86612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

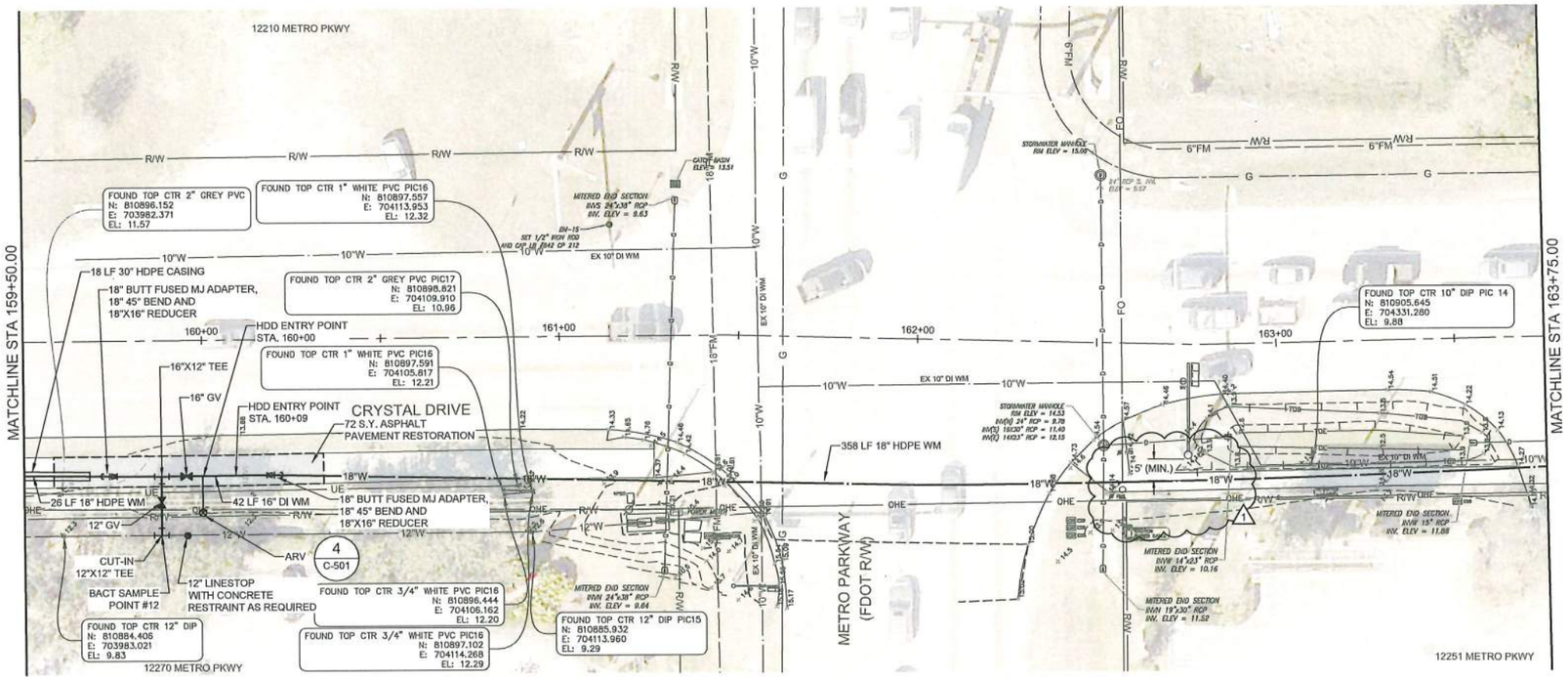
CRYSTAL DRIVE PLAN AND PROFILE

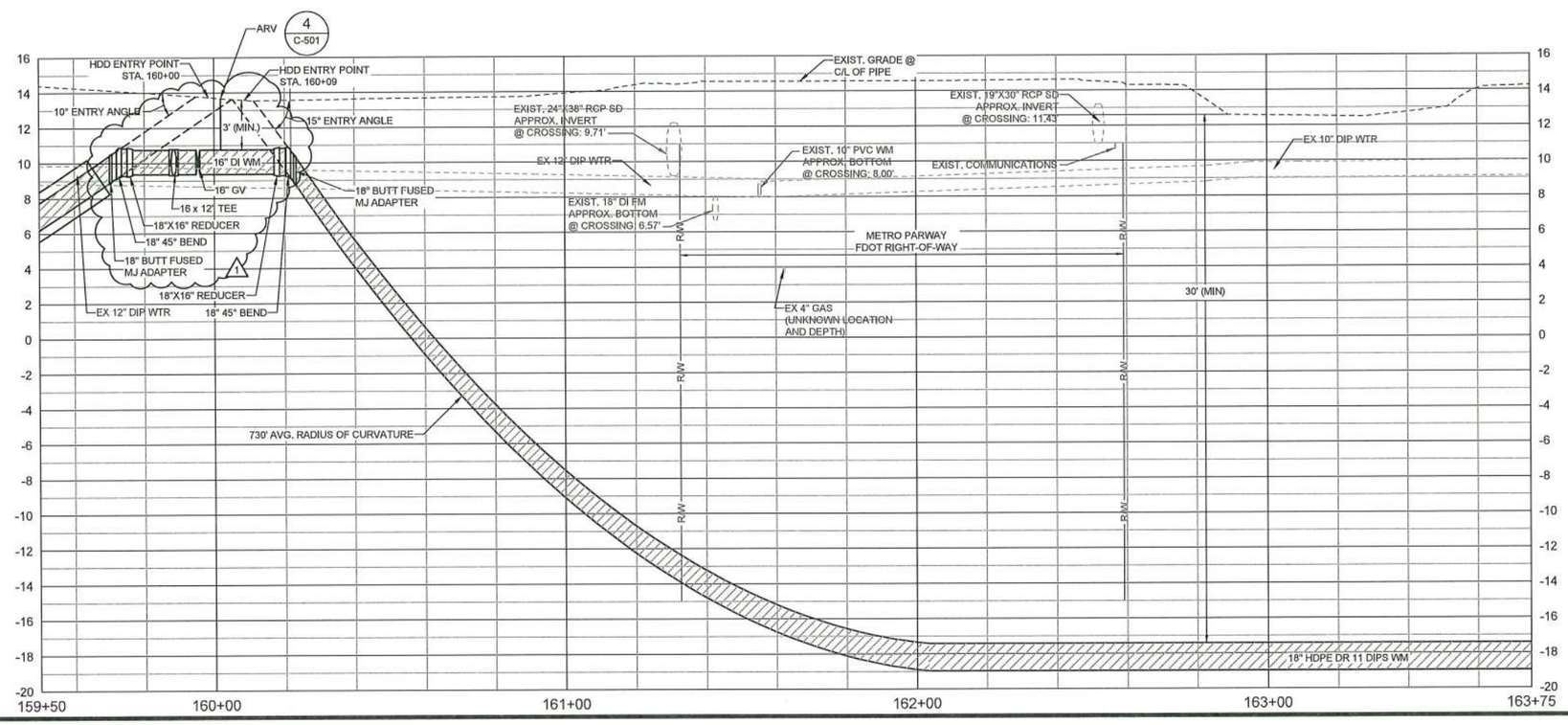
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-120

Bar Measures 1 inch

7/15/2020 7:56:41 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-120 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 4'

NOTE:
THE EXISTING DEPTH OF THE 4" GAS MAIN COULD NOT BE VERIFIED DURING DESIGN. CONTRACTOR SHALL MAKE ALL EFFORTS POSSIBLE TO VERIFY THE DEPTH OF THE EXISTING GAS MAIN PRIOR TO CONSTRUCTION USE EXTREME CAUTION DURING DRILL ACTIVITIES, COORDINATE ALL ACTIVITIES W/ TECO.

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LICENSE #69612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	FDOT COMMENT 05/28/2020	

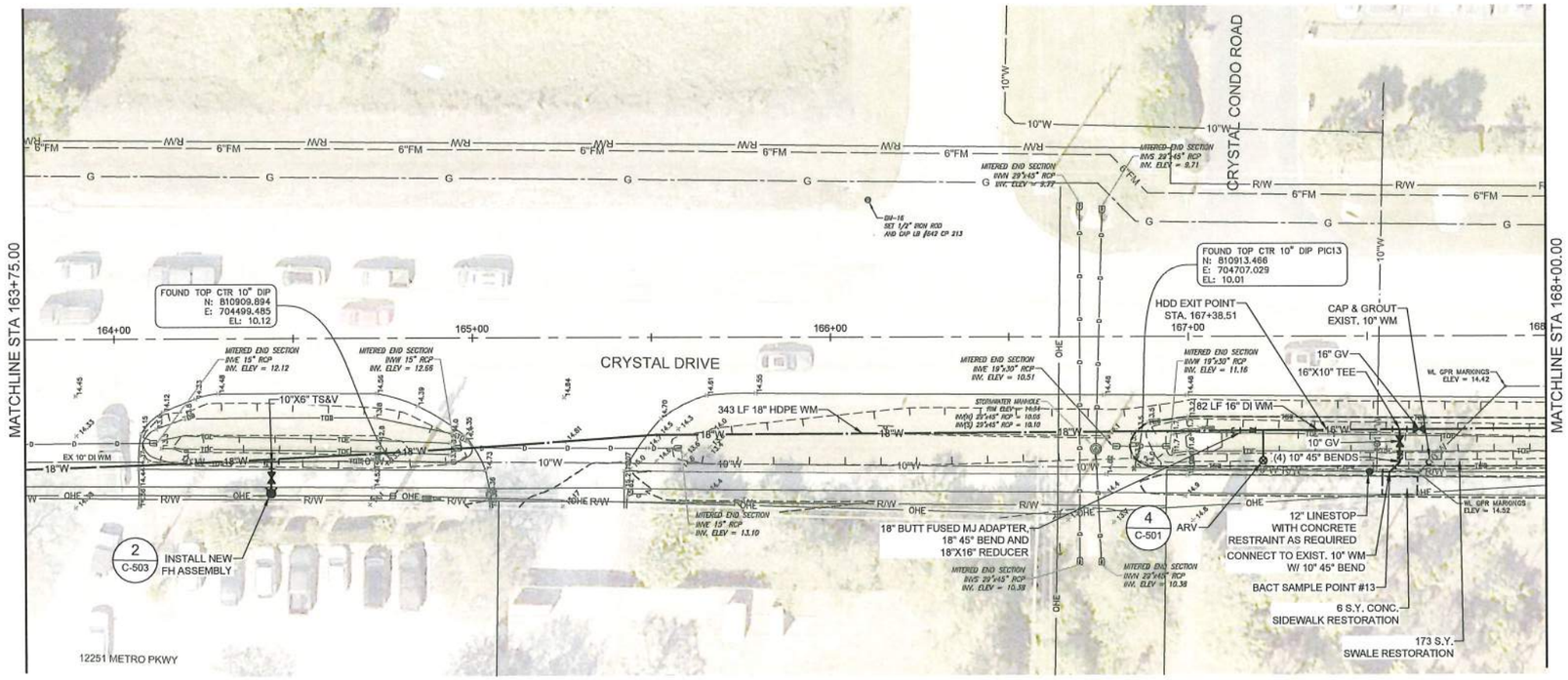
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

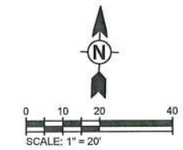
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

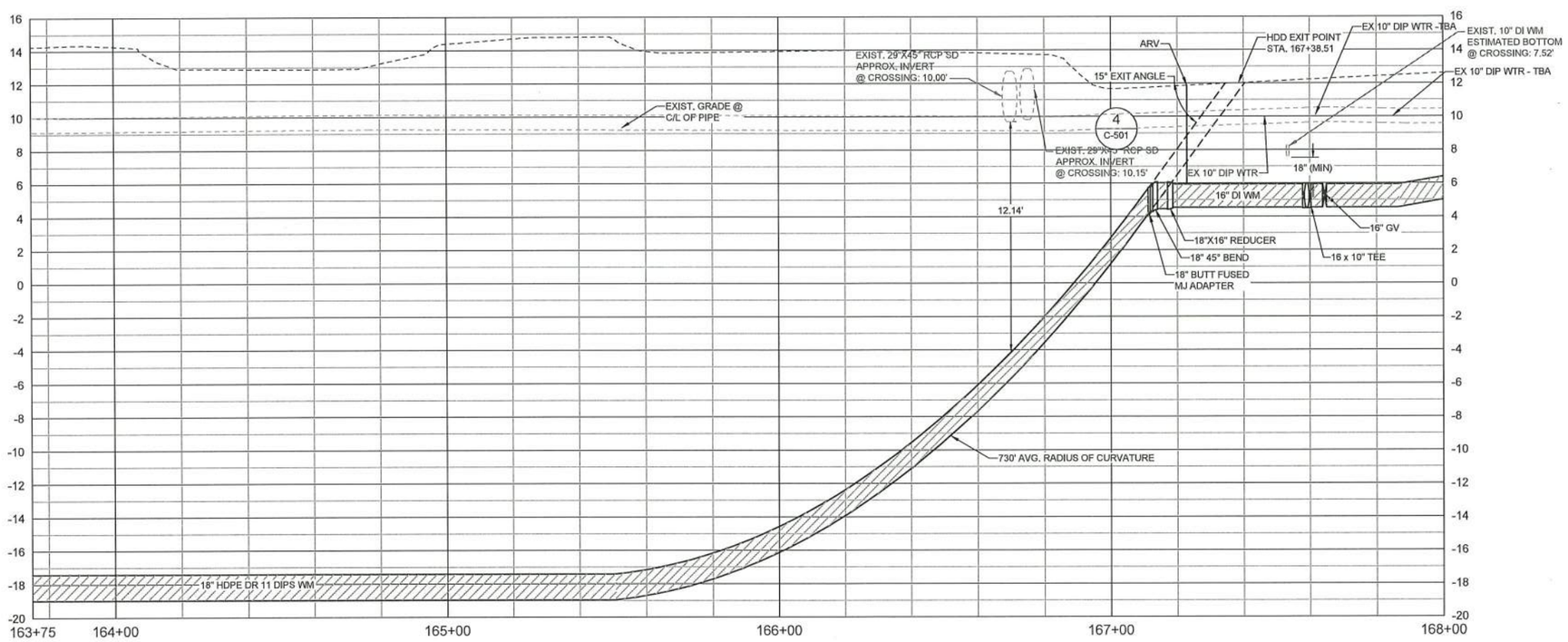
C-121

Bar Measures 1 inch

7/15/2020 7:59:47 PM - O:\PROJECTS\ORLANDOVER\01558\200-01558-19001\CAD\SHEETFILES\C-121 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE







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STEVEN AGAPI, P.E.
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10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

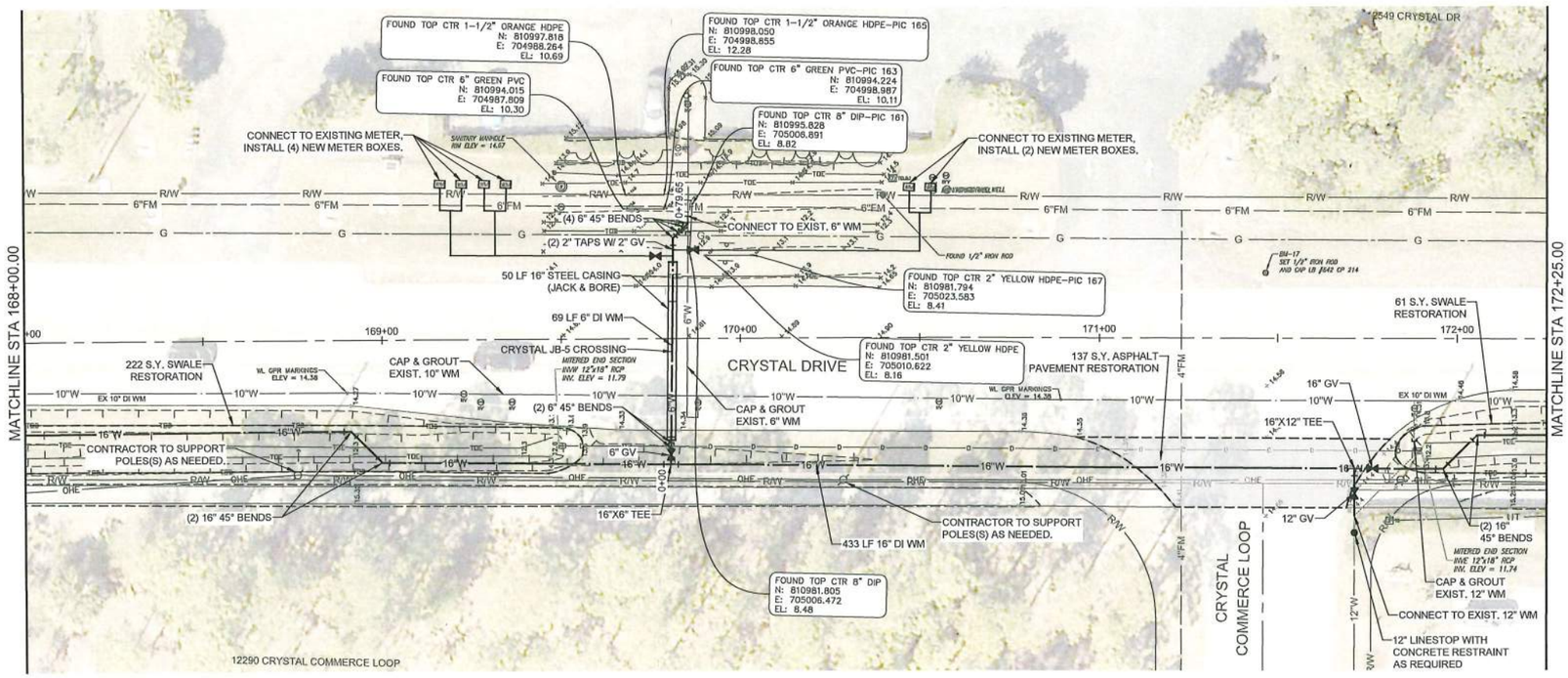
CRYSTAL DRIVE PLAN AND PROFILE

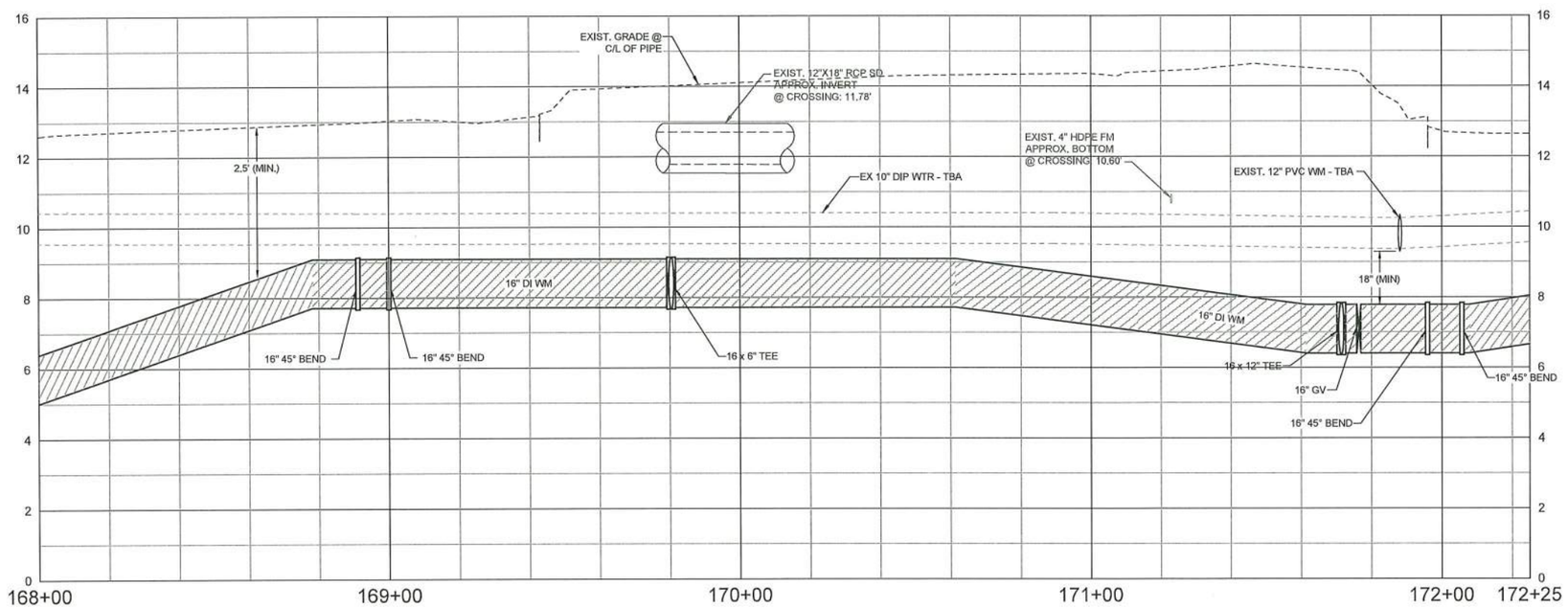
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

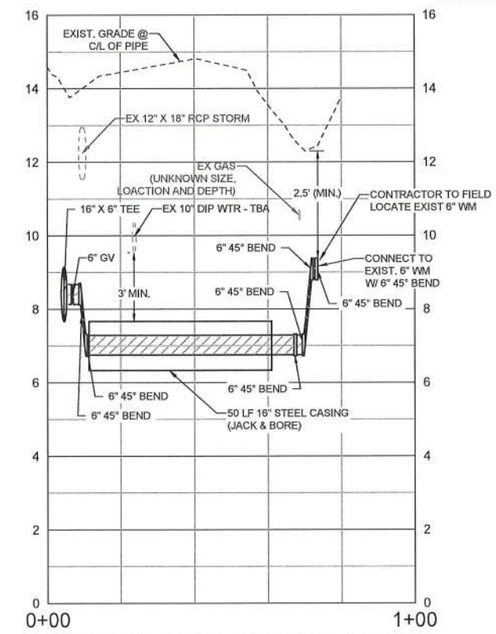
C-122

Bar Measures 1 inch

7/15/2020 8:02:40 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-122 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE







CRYSTAL JB-5 CROSSING PROFILE

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10600 Chevrolet Way, Suite 102
Estero, FL 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

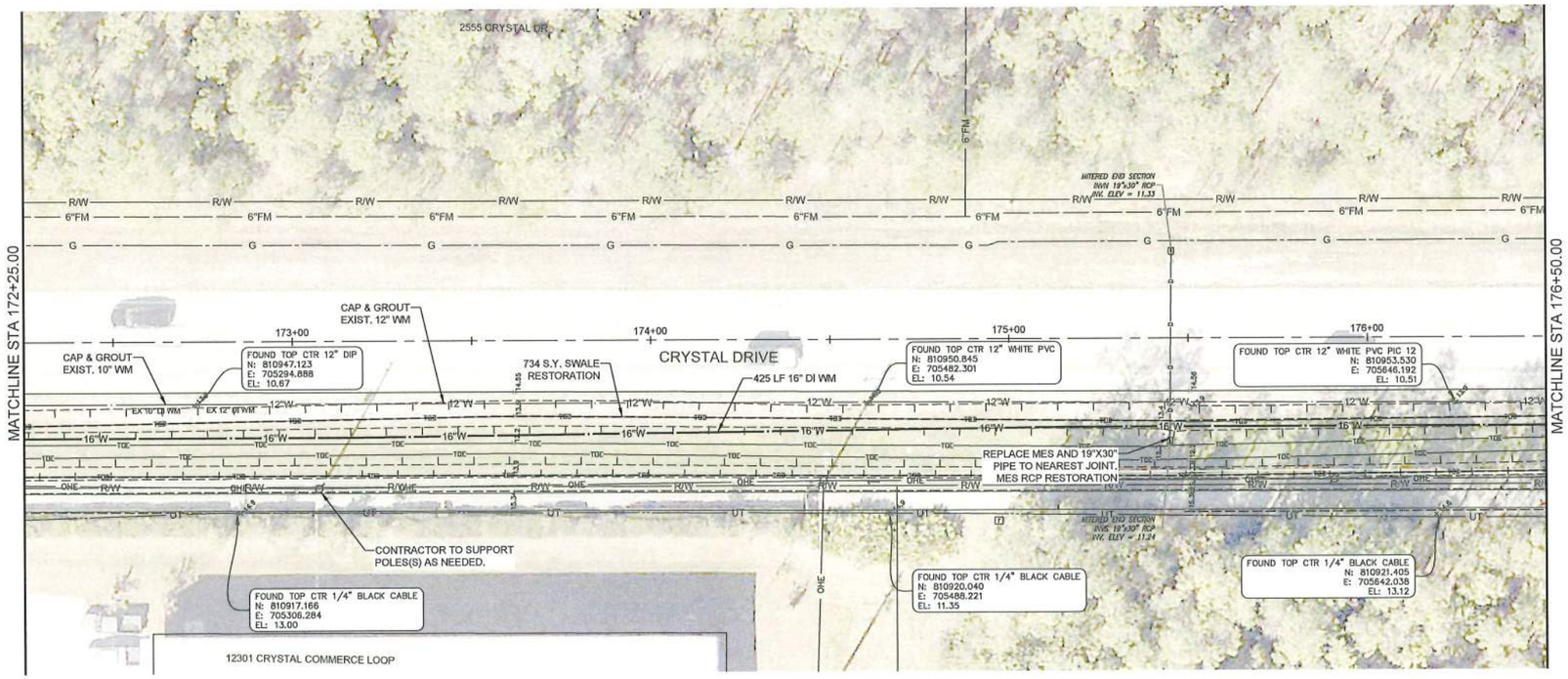
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CRYSTAL DRIVE
PLAN AND PROFILE

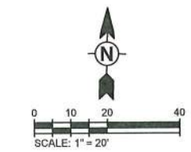
Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-123

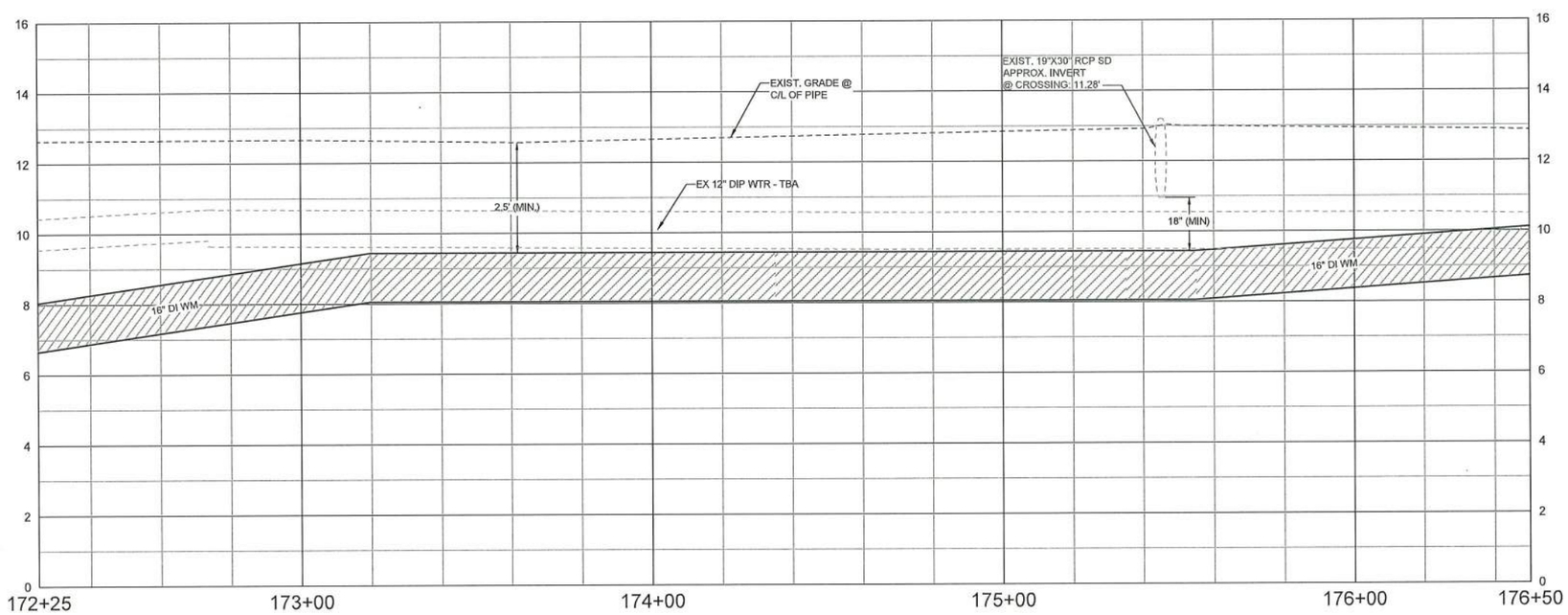
Bar Measures 1 inch

7/15/2020 8:06:24 PM - O:\PROJECTS\ORLANDO\ER\01558\200-01558-19001\CAD\SHEETFILES\C-123 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE





SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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PHONE: (239) 390-1467 FAX: (407) 839-3790

STEVEN AGAPI, P.E.
LICENSE #86612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

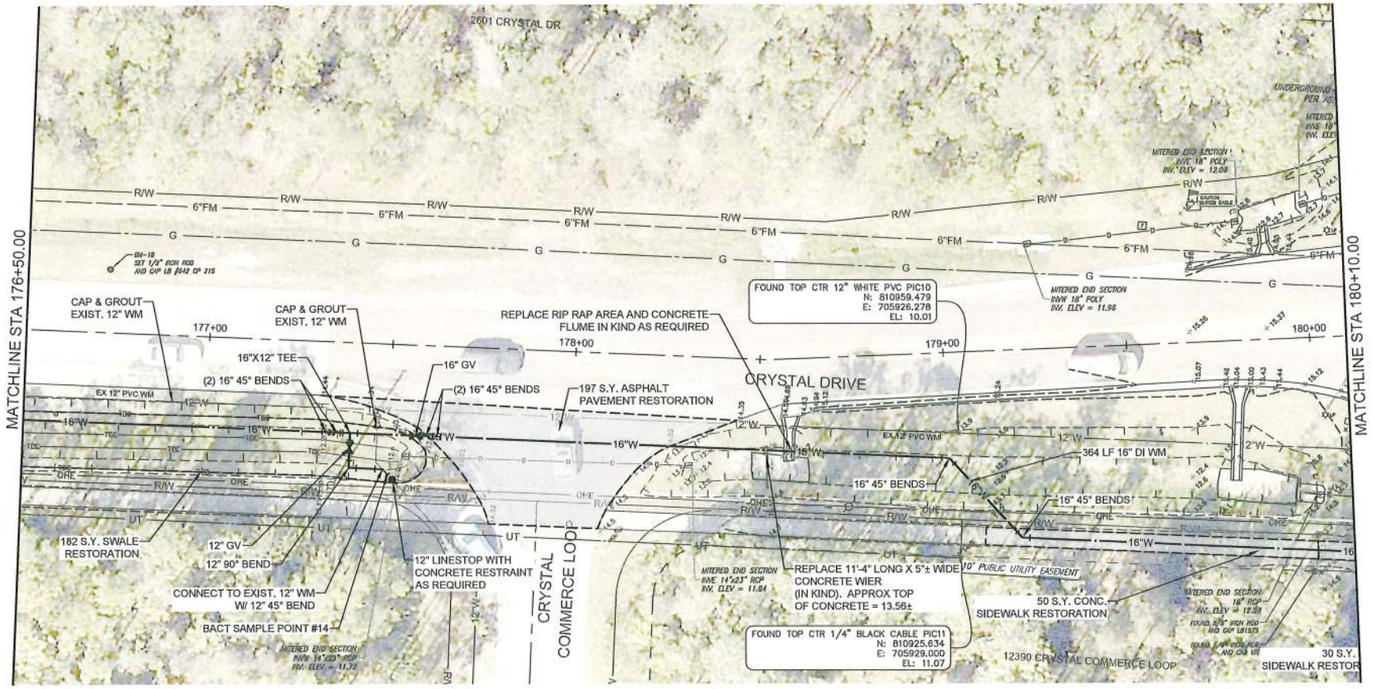
LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CYRSTAL DRIVE
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

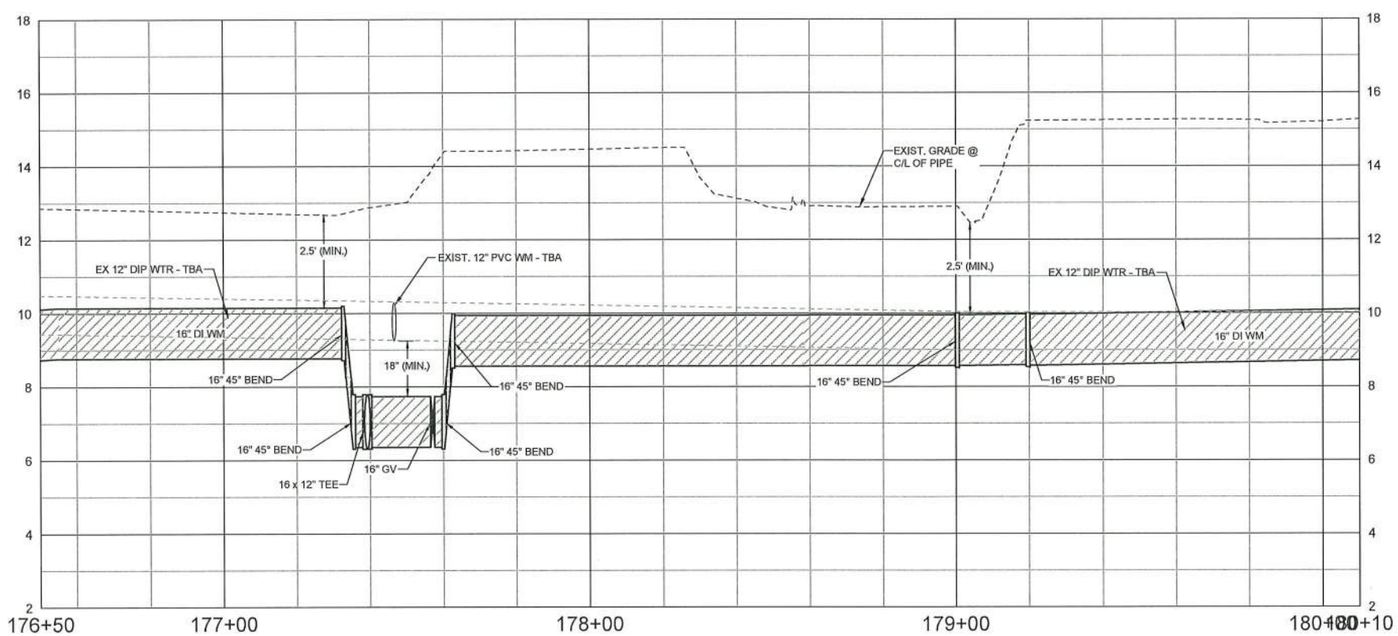
C-124

Bar Measures 1 inch

7/15/2020 8:09:20 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-124 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'



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ESTERO, FL 33928
PHONE: (239) 390-1467 FAX: (407) 839-3790

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LICENSE #88612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS

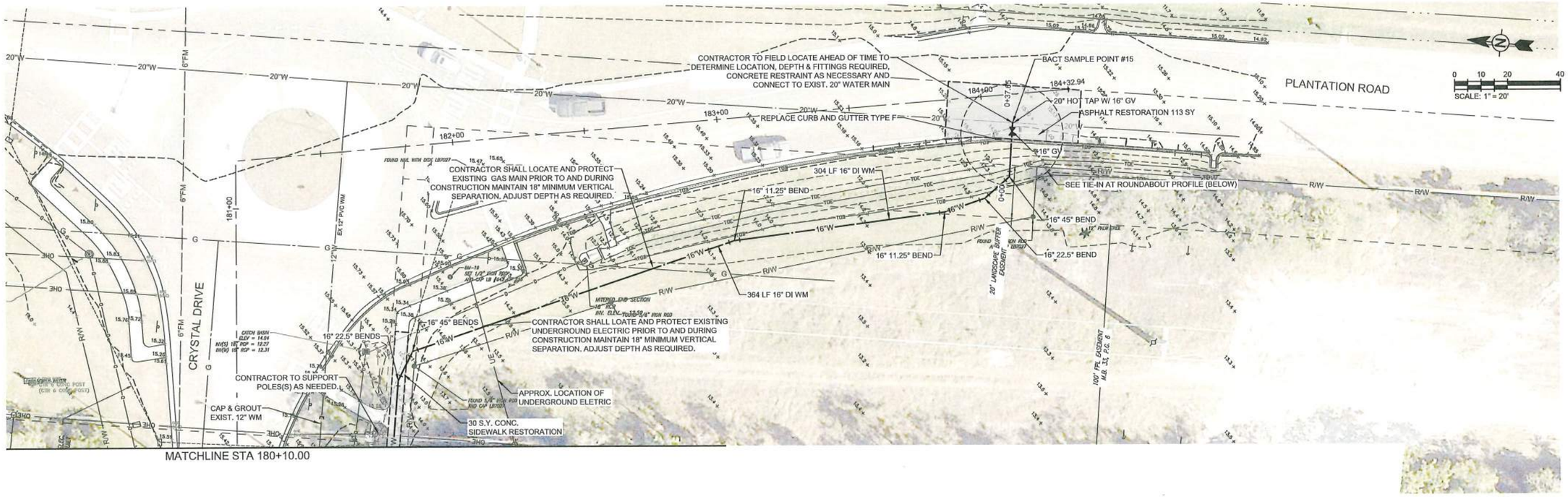
CRYSTAL DRIVE PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

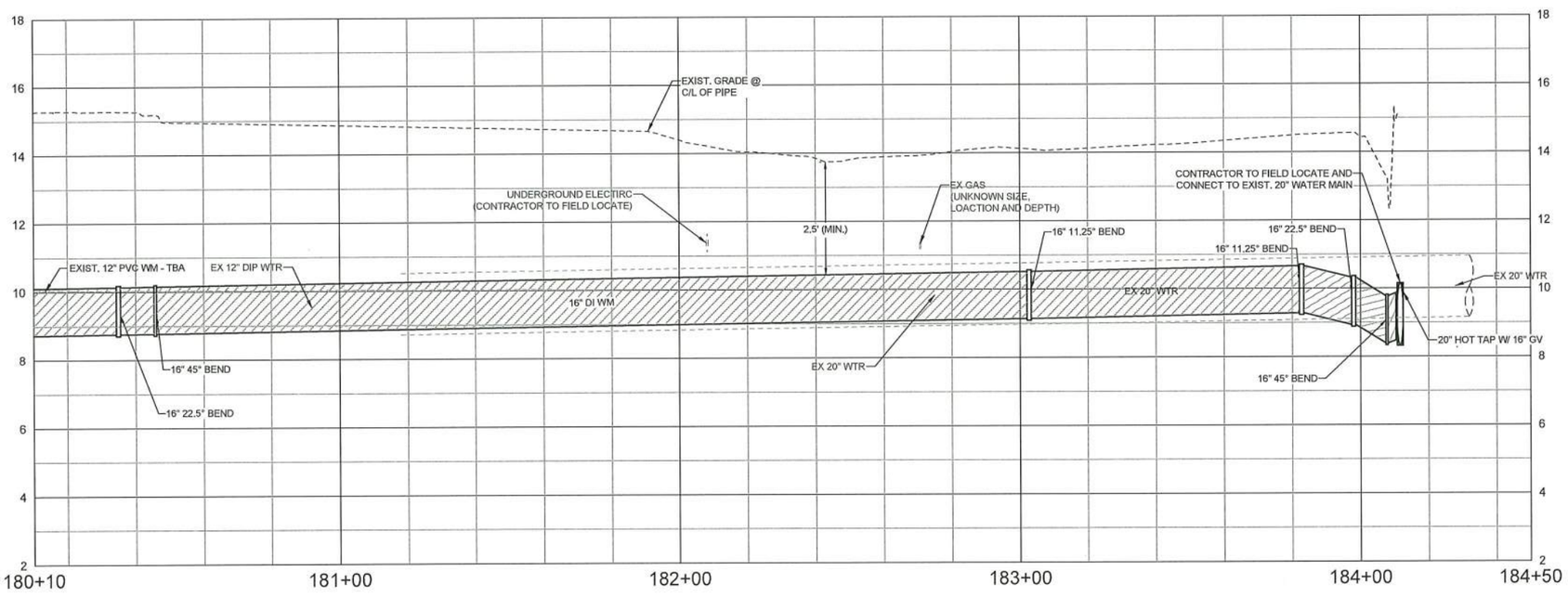
C-125

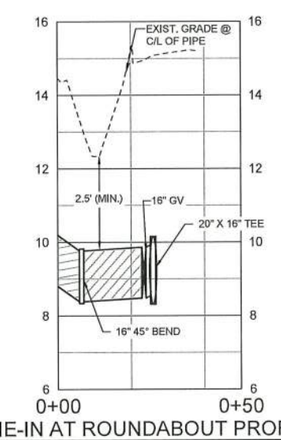
Bar Measures 1 Inch

7/15/2020 8:12:38 PM - O:\PROJECTS\ORLANDO\IER\01558\200-01558-19001\CAD\SHEETFILES\C-125 CRYSTAL DRIVE PLAN AND PROFILE.DWG - CYR, STEVE



SCALE:
HORIZ. 1"= 20'
VERT. 1" = 2'





TIE-IN AT ROUNDABOUT PROFILE

TETRA TECH
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Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
PLANTATION ROAD
PLAN AND PROFILE

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-126

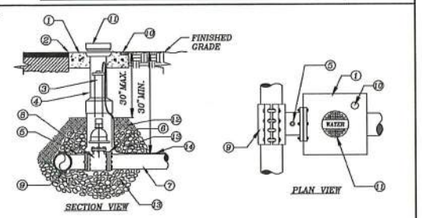
Bar Measures 1 inch

7/15/2020 8:15:57 PM - O:\PROJECTS\ORLANDOVER\01558\200-01558-19001\CAD\SHEETFILES\C-126 PLANTATION ROAD PLAN AND PROFILE.DWG - CYR, STEVE

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.1
LEE COUNTY UTILITIES
TAPPING SLEEVE AND VALVE

N.T.S.



1. CONCRETE PAD (SEE VALVE INSTALLATION DETAIL)
2. SET TOP OF BOX FLUSH WITH FINISHED GRADE
3. EXTENSION STEM IF TOP OF OPERATING NUT IS MORE THAN 30" BELOW FINISH GRADE
4. VALVE BOX (SEE VALVE INSTALLATION DETAIL)
5. OUTLET FOR TESTING
6. MJ RESTRAINED
7. MAIN SIZE VARIES
8. TAPPING VALVE (SEE VALVE INSTALLATION DETAIL)
9. LCU APPROVED ALL STAINLESS STEEL PRESSURE RATED TAPPING SLEEVE. FOR SIZE ON SIZE TAPS A FLANGED TAPPING SLEEVE IS REQUIRED. SPRING LOADED TAPPING SLEEVE IS REQUIRED WHEN CONNECTING TO HDPE (SEE APPROVED MATERIAL LIST).
10. BRASS PLATE (SEE VALVE INSTALLATION DETAIL)
11. CAST IRON DROP COVER MARKED "WATER","SEWER", OR "REUSE"
12. COMPACTED SUITABLE EARTH BACKFILL
13. 3/4" GRANULAR MATERIAL #57 STONE
14. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE (SEE LCU STANDARD DETAIL)

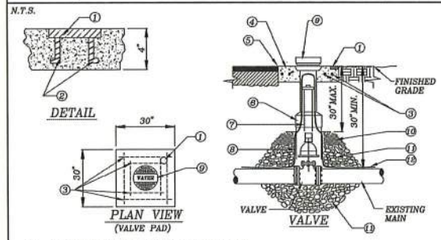
REV: 12/10/2015

1 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.2
LEE COUNTY UTILITIES
VALVE INSTALLATION

N.T.S.



1. BRASS PLATE: SIZE OF VALVE, VALVE TYPE No. OF TURNS & DIRECTION TO OPEN VALVE M.F.G. & YEAR INSTALL SYSTEM "WATER" OR "SEWER" OR "REUSE" OR "FIRE"
2. ANCHOR
3. EIGHT (8) #4 BARS OVERLAP EACH CORNER BY 2'
4. 30"SQ X 4" THK.CONC.PAD SURROUNDING BOX, MIN. 3,000 P.S.I. POURED IN PLACE
5. SET TOP OF BOX FLUSH WITH FINISHED GRADE
6. HEAVY DUTY TRAFFIC BEARING CAST IRON VALVE BOX, ADJUSTABLE SCREW TYPE, 5 1/4" DIAMETER SHAFT THAT IS LCU APPROVED
7. EXTENSION STEM WITH 2' OPERATING NUT AS REQUIRED, IF NUT IS MORE THAN 30" BELOW FINISH GRADE
8. RISER NOT TO BEAR ON VALVE OR PIPE
9. CAST IRON DROP COVER MARKED "WATER" OR "SEWER" OR "REUSE OR "FIRE"
10. COMPACTED SUITABLE EARTH BACKFILL
11. 3/4" GRANULAR MATERIAL #57 STONE
12. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE (SEE LCU STANDARD DETAIL)

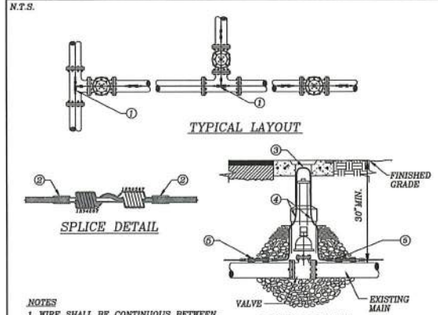
REV: 12/10/2015

2 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.3
LEE COUNTY UTILITIES
LOCATING WIRE FOR PRESSURE MAINS

N.T.S.



NOTES
1. WIRE SHALL BE CONTINUOUS BETWEEN VALVE BOXES. THE PVC RISER PIPE SHALL BE NOTCHED AND THE WIRE ATTACHED TO THE RISER PIPE TO ALLOW FOR THE WIRE TO FIT INSIDE THE CAST IRON VALVE BOX WITHOUT SHEARING THE WIRE.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE MAIN, AND SHALL BE TAPED TO IT AT 10' INTERVALS AND TAPED AT ALL FITTINGS. TAPE SHALL BE 10 MIL POLYETHYLENE.
3. CONTRACTOR SHALL CONDUCT A CONTINUITY TEST ON ALL LOCATING WIRE SPLICES PRIOR TO SCHEDULING THE OPTICAL FINAL INSPECTION WITH LCU.
4. ALL SPLICES SHALL UTILIZE A DIRECT BURY WATERPROOF SPLICE KIT. (SEE APPROVED MATERIAL LIST)

1. SPLICE RUN TOGETHER, KEEP CLEAR OF FITTING. TYPICAL
2. COVER SPLICE WITH 3 WRAPS OF 10 MIL. POLYETHYLENE TAPE
3. 6" LOOP OF BARE WIRE. 6" MAX. DEPTH TO TOP OF BARE WIRE
4. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE
5. SPLICE (SEE DETAIL THIS SHEET)

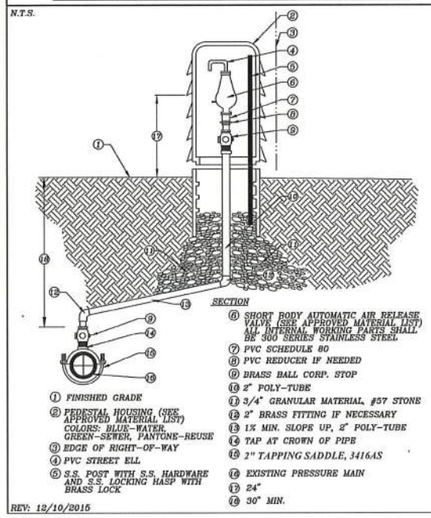
REV: 12/10/2015

3 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.4
LEE COUNTY UTILITIES
AUTOMATIC AIR RELEASE VALVE

N.T.S.



1. FINISHED GRADE
2. PEDESTAL HOUSING (SEE APPROVED MATERIAL LIST) COLORS: BLUE–WATER, GREEN–SEWER, PANTONE–REUSE
3. EDGE OF RIGHT–OF–WAY
4. PVC STREET ELL
5. S.S. POST WITH S.S. HARDWARE AND S.S. LOCKING HASP WITH BRASS LOCK
6. SHORT BODY AUTOMATIC AIR RELEASE VALVE (SEE APPROVED MATERIAL LIST) ALL INTERNAL WORKING PARTS SHALL BE 300 SERIES STAINLESS STEEL
7. PVC SCHEDULE 80
8. PVC REDUCER IF NEEDED
9. BRASS BALL CORP. STOP
10. 2" POLY–TUBE
11. 3/4" GRANULAR MATERIAL #57 STONE
12. 2" BRASS FITTING IF NECESSARY
13. 1% MIN. SLOPE UP, 2" POLY–TUBE
14. TAP AT CROWN OF PIPE
15. 2" TAPPING SADDLE, 3416AS
16. EXISTING PRESSURE MAIN
17. 24"
18. 30" MIN.

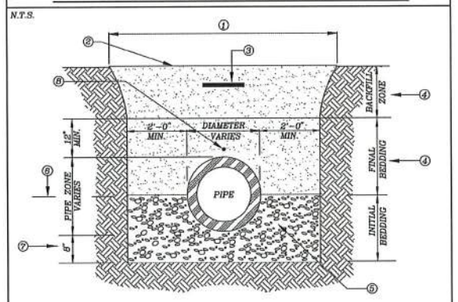
REV: 12/10/2015

4 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.5
LEE COUNTY UTILITIES
TRENCH CROSS SECTION

N.T.S.



1. EXCAVATED TRENCH
2. FINISHED GRADE
3. MARKING TAPE 12" DEPTH MAX.
4. MATERIALS CLEAN DRY SAND, FINE LIME ROCK OR PIT SHELL MECHANICALLY COMPACTED IN 6" LIFTS TO AT LEAST 95% OF MAX. DENSITY, OR 98% IF UNDER PAVED AREA OF ROADWAY.
5. #57 STONE LOCATED UNDER PIPE OR EXISTING UNDISTURBED SUITABLE MATERIAL
6. SPRING LINE
7. STANDARD 6" MIN TRENCH UNDERCUT AND BACKFILL WITH #57 STONE COMPACTED IN 6" LIFTS ADDITIONAL UNDERCUT AND CRUSHED ROCK BEDDING FOUNDATION WHEN DIRECTED BY L.C.U. THE CONTRACTOR IS TO REMOVE UNSTABLE MATERIAL FROM THE TRENCH FOUNDATION. THEN INSTALL STABILIZED CRUSHED ROCK BACKFILL WITH #57 STONE COMPACTED IN 6" LIFTS
8. LOCATING WIRE IS REQUIRED FOR ALL PRESSURIZED PIPELINES.

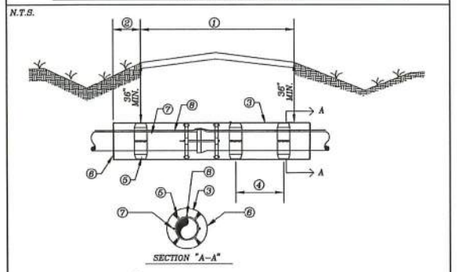
REV: 12/10/2015

5 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.6
LEE COUNTY UTILITIES
JACK AND BORE

N.T.S.



1. LIMITS OF PAVEMENT
2. EXTEND CASING 4' MIN. BEYOND E.O.P. AND/OR BACK OF CURB FOR L.C.D.O.T. MAINTAINED R.O.W. AND 8' MIN. FOR F.D.O.T. MAINTAINED R.O.W.
3. STEEL CASING PIPE CONFORMING TO ASTM A–139
4. 7'O.C. MAX OR AS PER MANUFACTURER'S RECOMMENDATION
5. L.C.U. APPROVED CASING SPACERS
6. SEAL CASING ENDS WITH: 8" WALL OF BRICK MASONRY WITH WEEP HOLE INSTALLED NEAR BOTTOM, OR APPROVED EQUAL
7. ALL JOINTS OF THE CARRIER PIPE SHALL HAVE BELL RESTRAINTS
8. 12 GAUGE DOUBLE INSULATED COPPER WIRE (SEE LCU STANDARD DETAIL)

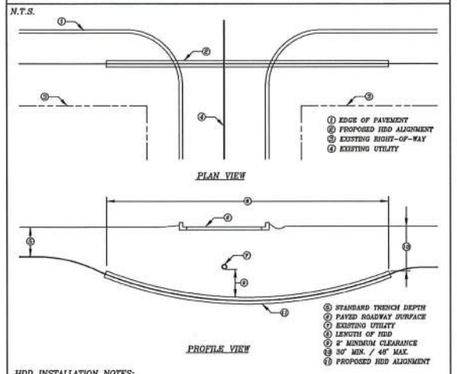
REV: 12/10/2015

6 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.7
LEE COUNTY UTILITIES
HORIZONTAL DIRECTIONAL DRILL UNDER A ROADWAY

N.T.S.



1. EDGE OF PAVEMENT
2. PROPOSED HDD ALIGNMENT
3. EXISTING RIGHT–OF–WAY
4. EXISTING UTILITY
5. STANDARD TRENCH DEPTH
6. PAVED ROADWAY SURFACE
7. EXISTING UTILITY
8. LENGTH OF HDD
9. 2' MINIMUM CLEARANCE
10. 30' MIN. / 40' MAX.
11. PROPOSED HDD ALIGNMENT

HDD INSTALLATION NOTES:
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LEE COUNTY UTILITIES DESIGN MANUAL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF AFFECTED AGENCIES AND COORDINATION WITH ALL UTILITIES PRIOR TO CONSTRUCTION.
3. ALL CONSTRUCTION MATERIALS INCLUDING DRILLING FLUID, SHALL BE REMOVED FROM THE SITE PRIOR TO RESTORATION OF DISTURBED AREAS.
4. ALL RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE LCU DESIGN MANUAL.
5. CASING DIAMETER SHALL BE IN ACCORDANCE WITH THE LCU DESIGN MANUAL.
6. NO CASING SPACERS REQUIRED.
7. WHEN CASING IS REQUIRED INSTALL 1" HDPE PIPE ATTACHED TO THE CARRIER PIPE WITH 12 GAUGE DOUBLE INSULATED COPPER WIRE INSIDE THE HDPE PIPE.

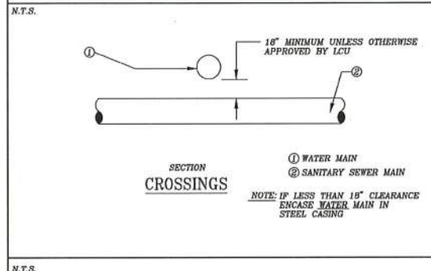
REV: 12/10/2015

7 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.8
LEE COUNTY UTILITIES
WATER AND SEWER CROSSING DETAIL

N.T.S.



REV: 12/10/2015

8 DETAIL
SCALE: NTS

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STEVEN AGAPI, P.E.
LICENSE #68612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, FL 33928
Engineering Business No. 2429

DATE

MARK	DESCRIPTION	DATE	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CIVIL DETAILS

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-501

Bar Measures 1 inch

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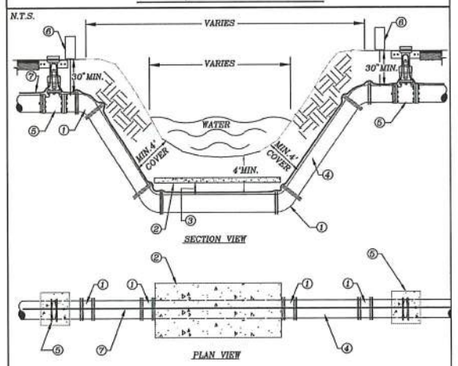
LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.9
LEE COUNTY UTILITIES
SUBAQUEOUS CROSSING

N.T.S.



1. 45° M.J. ELBOW RESTRAINED
2. 2,500 MIN. P.S.I. CONCRETE PROTECTIVE PAD 4' WIDE MIN. X 4" THICK X OVERALL LENGTH OF PIPELINE CROSSING
3. 6"MIN. COMPACTED MATERIAL OR #57 STONE
4. USE PVC C-900 DR 14 MIN. FOR ALL SEWAGE FORCE MAINS. USE PRESSURE CLASS 350 DIP FOR ALL WATER MAINS
5. GATE VALVE OR PLUG VALVE INSTALLATION PER LCU STANDARD DETAIL
6. AIR RELEASE VALVE (SEE APPROVED MATERIAL LIST)
7. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE (SEE LCU STANDARD DETAIL)

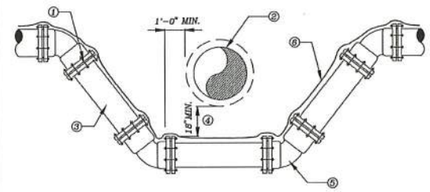
REV: 12/10/2015

1 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.10
LEE COUNTY UTILITIES
WATER PRESSURE LINE VERTICAL OFFSET W/ DUCTILE IRON MJ FITTINGS & PIPE

N.T.S.



1. LCU APPROVED JOINT RESTRAINT FOR D.I., M.J. PIPE AND FITTINGS PLACED IN ACCORDANCE WITH JOINT RESTRAINT SCHEDULE. (SEE DETAIL 6.12)
2. CONFLICT PIPE
3. LCU APPROVED DUCTILE IRON PIPING PRESSURE CLASS 350
4. 18" MIN. UNLESS OTHERWISE APPROVED BY LCU
5. 45° MECHANICAL JOINT FITTING, TYPICAL
6. 12 GAUGE DOUBLE INSULATED COPPER WIRE (SEE LCU STANDARD DETAIL)

REV: 12/10/2015

2 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.12
LEE COUNTY UTILITIES
RESTRAINED LENGTH SCHEDULE

N.T.S.

DUCTILE IRON PIPE

PIPE SIZE (Inches)	MINIMUM RESTRAINED PIPE LENGTH (FEET) HORIZONTAL BENDS 90°	45°	22-1/2°	11-1/4°	DEAD END	HORIZONTAL TEE
4	17	7	4	2	29	6
6	23	10	5	2	40	17
8	29	12	6	3	53	29
10	35	14	7	4	63	38
12	41	17	8	4	74	49
16	51	21	11	5	94	68
24	69	29	14	7	131	105
30	81	34	17	8	156	129

PVC PIPE

PIPE SIZE (Inches)	MINIMUM RESTRAINED PIPE LENGTH (FEET) HORIZONTAL BENDS 90°	45°	22-1/2°	11-1/4°	DEAD END	HORIZONTAL TEE
4	20	8	4	2	45	8
6	29	12	6	3	63	25
8	36	15	8	4	83	43
10	44	18	9	5	99	58
12	51	21	11	5	116	74
16	63	26	13	7	149	103
24	87	36	18	9	208	158
30	102	42	21	10	248	194

A COMPLETE JOINT RESTRAINING SCHEDULE FOR ALL ENCOUNTERED VERTICAL & HORIZONTAL BENDS, VERTICAL OFFSETS, TEES, AND DEAD ENDS SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER.

LENGTH FIGURES BASED ON FOLLOWING:

Pressure = 150 psi, FS = 1.5, trench type = 3, 30" cover on Bare pipe, Soil type = GP & SP

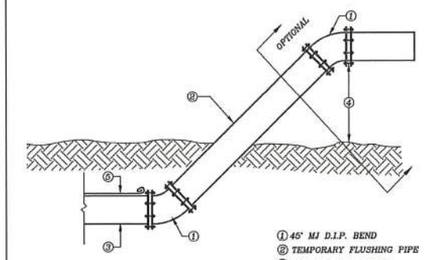
REV: 12/10/2015

3 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.13
LEE COUNTY UTILITIES
WATER MAIN FLUSHING DETAIL

N.T.S.



1. 45° MJ D.I.P. BEND
2. TEMPORARY FLUSHING PIPE
3. END OF WATER MAIN
4. 24" MIN.

NOTES:

1. FLUSHING DETAIL TO BE USED ON WATER LINES 8" DIAMETER OR GREATER.
2. FLUSHING PIPE SHALL BE THE SAME DIAMETER AS WATER MAIN.
3. CONTRACTOR SHALL PROVIDE ADEQUATE DRAINAGE FOR FLUSHED WATER.
4. PROVIDE M.J. CAP IF ASSEMBLY IS LEFT IN PLACE UNATTENDED.
5. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE (SEE LCU STANDARD DETAIL)

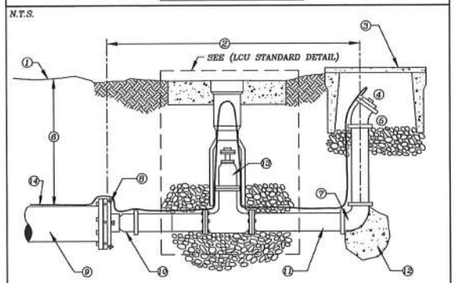
REV: 12/10/2015

4 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.14
LEE COUNTY UTILITIES
BLOW OFF DETAIL

N.T.S.



1. FINISHED GRADE
2. 6'-0" MAX.
3. WATER METER BOX W/GRAVEL BOTTOM (SEE APPROVED MATERIAL LIST)
4. 2" THREADED PLUG
5. 2"-45° BEND
6. 30" MIN.
7. 2"-90° BEND
8. M.J. CAP WITH 2" TAP
9. END OF WATER MAIN, R.J. PER SCHEDULE
10. 2" THREADED
11. 2" P.V.C.(SCH 80) M.P.C. MALE ADAPTER
12. POURED IN PLACE THRUST BLOCKING (SEE DETAIL 9.20)
13. 2" DIAMETER GATE VALVE
14. 12 GAUGE DOUBLE INSULATED COPPER LOCATING WIRE (SEE LCU STANDARD DETAIL)

NOTE:
ALL PIPING TO BE 2" P.V.C. (SCH 80) THREADED FITTINGS OR SOLVENT WELDED FITTINGS

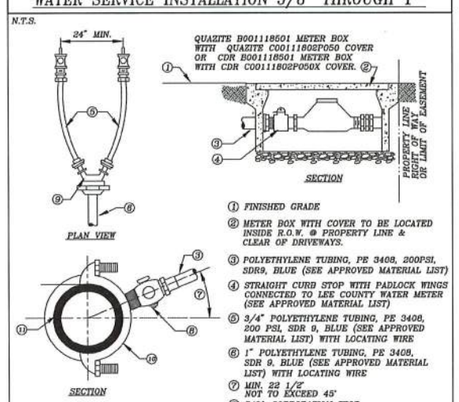
REV: 12/10/2015

5 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.16
LEE COUNTY UTILITIES
WATER SERVICE INSTALLATION 5/8" THROUGH 1"

N.T.S.



1. FINISHED GRADE
2. METER BOX WITH COVER TO BE LOCATED INSIDE R.O.W. @ PROPERTY LINE & CLEAR OF DRIVEWAYS.
3. POLYETHYLENE TUBING, PE 3408, 200PSI, SDR9, BLUE (SEE APPROVED MATERIAL LIST)
4. STRAIGHT CURB STOP WITH PADLOCK WINGS CONNECTED TO LEE COUNTY WATER METER (SEE APPROVED MATERIAL LIST)
5. 3/4" POLYETHYLENE TUBING, PE 3408, 200 PSI, SDR 9, BLUE (SEE APPROVED MATERIAL LIST) WITH LOCATING WIRE
6. 1" POLYETHYLENE TUBING, PE 3408, SDR 9, BLUE (SEE APPROVED MATERIAL LIST) WITH LOCATING WIRE
7. MIN. 22 1/2° NOT TO EXCEED 45°
8. BALL CORPORATION STOP (SEE APPROVED MATERIAL LIST)
9. BRASS "Y" OR "I" CONNECT (SEE APPROVED MATERIAL LIST)
10. DOUBLE STRAP SERVICE SADDLE PROVIDE SPRING LOADED TAPPING SADDLE WHEN TAPPING HDPE (SEE APPROVED MATERIAL LIST)
11. WATER MAIN

NOTES:

1. TUBING UNDER ROADWAY SHALL BE ENCASED IN 4" P.V.C. PIPE SCHEDULE 40 MINIMUM AND EXTEND 4 FEET BEYOND THE EDGES OF PAVEMENT OR BACK OF CURB.

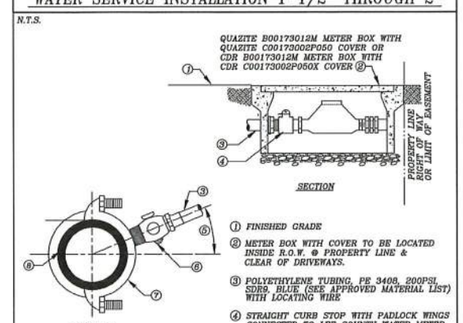
REV: 12/10/2015

6 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.17
LEE COUNTY UTILITIES
WATER SERVICE INSTALLATION 1-1/2" THROUGH 2"

N.T.S.



1. FINISHED GRADE
2. METER BOX WITH COVER TO BE LOCATED INSIDE R.O.W. @ PROPERTY LINE & CLEAR OF DRIVEWAYS.
3. POLYETHYLENE TUBING, PE 3408, 200PSI, SDR9, BLUE (SEE APPROVED MATERIAL LIST) WITH LOCATING WIRE
4. STRAIGHT CURB STOP WITH PADLOCK WINGS CONNECTED TO LEE COUNTY WATER METER (SEE APPROVED MATERIAL LIST)
5. MIN. 22 1/2° NOT TO EXCEED 45°
6. BALL CORPORATION STOP (SEE APPROVED MATERIAL LIST)
7. DOUBLE STRAP SERVICE SADDLE PROVIDE SPRING LOADED TAPPING SADDLE WHEN TAPPING HDPE (SEE APPROVED MATERIAL LIST)
8. WATER MAIN

NOTE:

1. TUBING UNDER ROADWAY SHALL BE ENCASED IN 4" P.V.C. PIPE SCHEDULE 40 MINIMUM AND EXTEND 4 FEET BEYOND THE EDGES OF PAVEMENT OR BACK OF CURB.

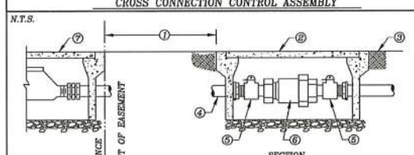
REV: 12/10/2015

7 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.18
LEE COUNTY UTILITIES
5/8" THROUGH 2" SINGLE FAMILY RESIDENTIAL CROSS CONNECTION CONTROL ASSEMBLY

N.T.S.



1. 1 FT. MINIMUM – 2 FT. MAXIMUM, LOCATED IN P.U.E.
2. UTILITY BOX WITH COVER, TO BE LOCATED CLEAR OF DRIVEWAYS (SEE APPROVED MATERIAL LIST)
3. FINISHED GRADE
4. POLYETHYLENE TUBING, PE3408, 200 PSI SDR9, BLUE (SEE APPROVED MATERIAL LIST)
5. STRAIGHT CURB STOP (SEE APPROVED MATERIAL LIST)
6. L.C.U. APPROVED DUAL CHECK BACKFLOW PREVENTER (SEE APPROVED MATERIAL LIST)
7. WATER METER BOX

NOTE:

1. INITIAL DEVICE TESTING REQUIRED. REFURBISH OR REPLACE DUAL CHECK BACKFLOW PREVENTER AT LEAST EVERY 5 TO 10 YEARS.

DATE: 12/10/2015

8 DETAIL
SCALE: NTS

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STEVEN AGAPI, P.E.
LICENSE #89812
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2428

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CIVIL DETAILS

Project No.: 200-01558-19001
Designed By:
Drawn By:
Checked By:

C-502

Bar Measures 1 inch

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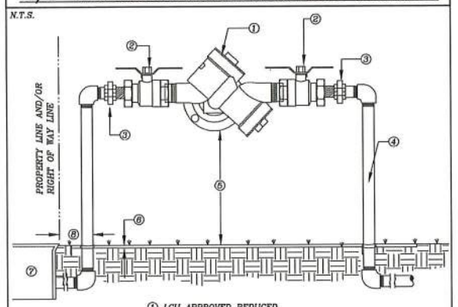
LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.19
LEE COUNTY UTILITIES
3/4" TO 2" CROSS CONNECTION CONTROL ASSEMBLY

N.T.S.



1. LCU APPROVED REDUCED PRESSURE BACKFLOW PREVENTION DEVICE (SEE APPROVED MATERIAL LIST)
2. FULL FLOW BRONZE BALL VALVE
3. UNION
4. ALL PIPING AND FITTINGS SHALL BE BRASS OR COPPER
5. 12" MIN. – 24" MAX. UNLESS OTHERWISE APPROVED BY LCU
6. FINISHED GRADE
7. METER BOX
8. 2" MAXIMUM

NOTES:
1. UNIONS REQUIRED
2. INITIAL AND ANNUAL DEVICE TESTING REQUIRED

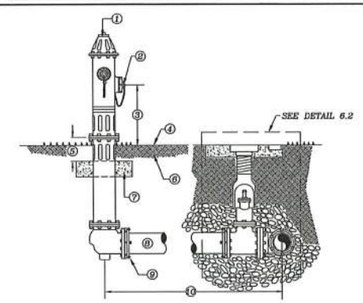
REV: 12/10/2015

1 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.24
LEE COUNTY UTILITIES
FIRE HYDRANT ASSEMBLY

N.T.S.



1. FIRE HYDRANT: STANDARD A.W.W.A. SAFETY YELLOW (SEE APPROVED MATERIAL LIST)
2. PUMPER CONNECTION FACING AS PER FIRE DISTRICT RECOMMENDATION
3. 16" MIN. – 24" MAX.
4. FINISHED GRADE
5. 6" MIN. CLEARANCE
6. COMPACTED FILL
7. 30" X 30" X 4" CONCRETE BREAK AWAY CONCRETE PAD, 3000 P.S.I.
8. PIPE TO BE D.I.P., PRESSURE CLASS 350
9. RESTRAINED JOINTS, FROM HYDRANT TO WATER MAIN
10. VARIABLE DISTANCE, IF GREATER THAN 100' A VALVE SHALL BE INSTALLED AT HYDRANT BASE

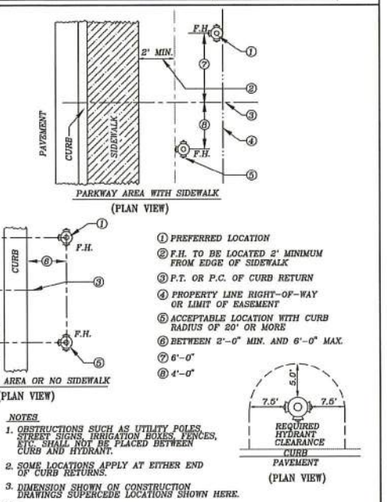
REV: 12/10/2015

2 DETAIL
SCALE: NTS

LEE COUNTY UTILITY STANDARD DETAIL

STANDARD DETAIL NO. 6.25
LEE COUNTY UTILITIES
FIRE HYDRANT LOCATIONS/CLEARANCE

N.T.S.



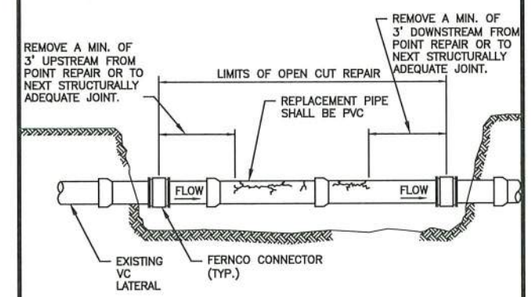
1. PREFERRED LOCATION
2. F.H. TO BE LOCATED 2' MINIMUM FROM EDGE OF SIDEWALK
3. P.T. OR P.C. OF CURB RETURN
4. PROPERTY LINE RIGHT-OF-WAY OR LIMIT OF EASEMENT
5. ACCEPTABLE LOCATION WITH CURB RADIUS OF 20' OR MORE
6. BETWEEN 2'-0" MIN. AND 6'-0" MAX.
7. 6'-0"
8. 4'-0"

NOTES:
1. OBSTRUCTIONS SUCH AS UTILITY POLES, STREET SIGNS, IRRIGATION BOXES, FENCES, ETC. SHALL NOT BE PLACED BETWEEN CURB AND HYDRANT.
2. SOME LOCATIONS APPLY AT EITHER END OF CURB RETURNS.
3. DIMENSION SHOWN ON CONSTRUCTION DRAWINGS SUPERCEDE LOCATIONS SHOWN HERE.

REV: 12/10/2015

3 DETAIL
SCALE: NTS

LATERAL REPAIR DETAIL



4 DETAIL
SCALE: NTS

FDOT MITERED END SECTION

DIMENSIONS AND QUANTITIES

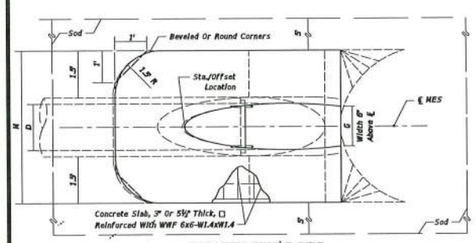
	D	X	A	B	C	E	F	G	H □	H Single Pipe	H Double Pipe	H Triple Pipe	H Quad. Pipe	N ⌐	5½" CONCRETE SLAB (CY) □ Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe	⌐ SODDING (SY) Single Pipe	Double Pipe	Triple Pipe	Quad. Pipe
1:2 Slope	15"	2'-7"	1.92'	2.18'	4.10'	2.00'	9'	1.22'	2.9'	4.63'	7.21'	9.79'	12.37'	1.19'	0.38	0.58	0.77	0.96	21	24	27	30
	18"	2'-10"	1.97'	2.74'	4.71'	2.50'	9'	1.41'	3.4'	4.92'	7.79'	10.58'	13.42'	1.21'	0.44	0.65	0.87	1.09	22	25	28	31
	24"	3'-9"	2.09'	3.89'	5.91'	3.50'	7'	1.73'	3.4'	5.50'	8.92'	12.33'	15.75'	1.25'	0.54	0.83	1.12	1.42	24	28	32	35
	30"	4'-3"	2.19'	4.95'	7.10'	4.50'	8'	2.00'	3.4'	6.08'	10.33'	14.58'	18.83'	1.29'	0.66	1.09	1.50	1.91	26	31	35	40
	36"	5'-1"	2.25'	6.08'	8.33'	5.50'	9'	2.24'	3.4'	6.67'	11.75'	16.83'	21.92'	1.33'	0.81	1.38	1.95	2.51	28	34	39	45
	42"	6'-0"	2.34'	7.21'	9.59'	6.50'	10'	2.45'	3.4'	7.25'	13.25'	19.25'	25.25'	1.38'	0.97	1.70	2.45	3.19	30	37	43	50
	48"	6'-9"	2.43'	8.33'	10.76'	7.50'	11'	2.65'	3.4'	7.83'	14.50'	21.33'	28.08'	1.42'	1.13	2.04	2.93	3.84	32	39	47	54
	54"	7'-6"	2.52'	9.44'	11.98'	8.50'	12'	2.83'	3.4'	8.42'	16.08'	23.75'	31.42'	1.46'	1.31	2.44	3.58	4.72	34	42	51	59
	60"	8'-6"	2.62'	10.56'	13.18'	9.50'	14'	3.00'	4.4'	9.00'	17.50'	26.00'	34.50'	1.50'	1.51	2.89	4.28	5.68	36	45	55	64
	66"	9'-2"	2.71'	11.68'	14.39'	10.50'	15'	3.18'	4.4'	9.58'	18.79'	27.92'	37.08'	1.54'	1.68	3.25	4.84	6.43	38	48	58	68
	72"	10'-0"	2.80'	12.80'	15.60'	11.50'	16'	3.30'	4.4'	10.16'	20.16'	30.16'	40.16'	1.58'	1.89	3.74	5.59	7.45	40	51	62	73
1:4 Slope	15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.0'	4.63'	7.31'	9.79'	12.37'	1.19'	0.57	0.87	1.15	1.44	23	26	29	32
	18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.0'	4.92'	7.79'	10.58'	13.42'	1.21'	0.66	0.99	1.31	1.65	25	28	31	35
	24"	3'-9"	2.53'	7.18'	9.71'	7.03'	11'	1.73'	4.0'	5.50'	8.92'	12.33'	15.75'	1.25'	0.85	1.30	1.75	2.20	28	32	36	40
	30"	4'-3"	2.70'	8.29'	11.19'	9.03'	13'	2.00'	4.0'	6.08'	10.33'	14.58'	18.83'	1.29'	1.10	1.74	2.38	3.05	31	36	41	46
	36"	5'-1"	2.87'	11.31' ◇	14.18'	11.03' ○	15'	2.24'	4.0'	6.67'	11.75'	16.83'	21.92'	1.33'	1.32	2.21	3.08	3.96	34	40	46	52
	42"	6'-0"	3.05'	13.37"	16.42'	13.03'	17'	2.45'	4.0'	7.25'	13.25'	19.25'	25.25'	1.38'	1.58	2.76	3.91	5.09	38	44	51	58
	48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	4.0'	7.83'	14.50'	21.33'	28.08'	1.42'	1.85	3.30	4.73	6.17	41	48	56	63
	54"	7'-6"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	4.0'	8.42'	16.08'	23.75'	31.42'	1.46'	2.14	3.95	5.77	7.58	44	52	61	69
	60"	8'-6"	3.56'	19.59'	23.11'	19.03'	23'	3.00'	4.0'	9.00'	17.50'	26.00'	34.50'	1.50'	2.45	4.66	6.87	9.07	47	56	66	75
	66"	9'-2"	3.73'	21.62'	25.35'	21.03'	25'	3.18'	4.0'	9.58'	18.79'	27.92'	37.08'	1.54'	2.88	5.54	8.18	10.84	49	59	69	80
	72"	10'-0"	3.91'	23.68'	27.59'	23.03'	27'	3.30'	4.0'	10.16'	20.16'	30.16'	40.16'	1.58'	3.54	6.81	9.87	13.13	52	63	74	85

□ See General Note No. 5.
⌐ See Sheet 5 For 3" Slab Quantities

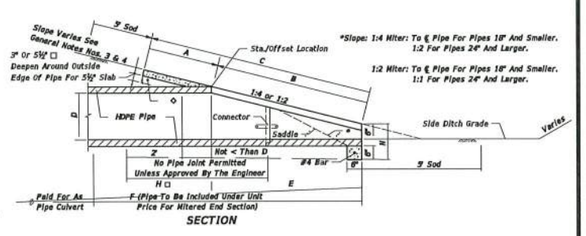
□ Values shown for estimating pipe quantities and are for information only.

B	E	
6.42'	6.25'	Dimensions permitted to allow use of B standard pipe lengths.
○◇10.40'	◇ 10.10'	Dimensions permitted to allow use of 12' standard pipe lengths

◇ Concrete slab shall be deepened to form bridge across crown of pipe. See section below.



TOP-VIEW SINGLE PIPE



SECTION

*Slope: 1:4 Miter: To ℄ Pipe For Pipes 18" And Smaller. 1:2 For Pipes 24" And Larger.

1:2 Miter: To ℄ Pipe For Pipes 18" And Smaller. 1:1 For Pipes 24" And Larger.

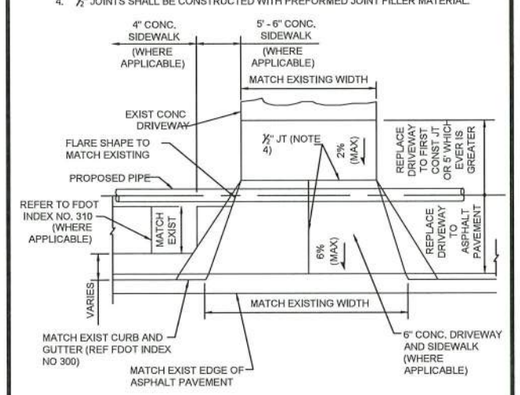
5 DETAIL
SCALE: NTS

PER FDOT INDEX # 430-021
PER FDOT SPECIFICATIONS 430

DRIVEWAY RESTORATION DETAIL

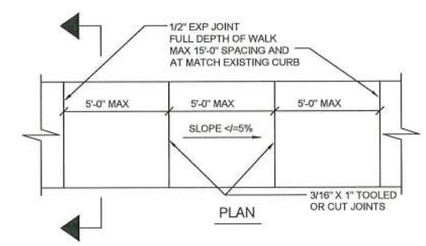
NOTES FOR REPLACEMENT URBAN FLARED TURNOUTS

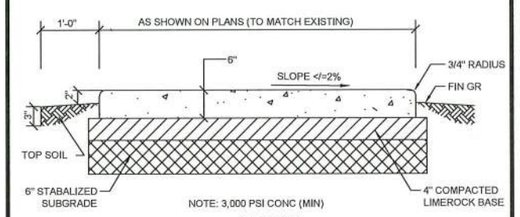
1. DRIVEWAY 6" CONCRETE PAVEMENT AND DROP CURB SHALL MEET THE MATERIAL AND CONSTRUCTION REQUIREMENTS OF SECTIONS 522 AND 520 RESPECTIVELY OF THE FDOT STANDARD SPECIFICATIONS. THE DRIVEWAY FOUNDATION SHALL MEET THE REQUIREMENT OF SUBARTICLE 522-4.
2. DRIVEWAYS AND DRIVEWAY APRONS SHALL BE 6" INCHES THICK, CLASS B CONCRETE, WITH 6X6-10/10 WWM, 3000 PSI MIN.
3. DRIVEWAY SHALL CONFORM WITH FDOT STANDARD INDEX NO. 515.
4. ½" JOINTS SHALL BE CONSTRUCTED WITH PREFORMED JOINT FILLER MATERIAL.



6 DETAIL
SCALE: NTS

CONCRETE SIDEWALK





SECTION

8 DETAIL
SCALE: NTS

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STEVEN AGAPI, P.E.
LICENSE #89612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	LDO COMMENT 06/16/2020	

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
CIVIL DETAILS

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-503

Bar Measures 1 inch

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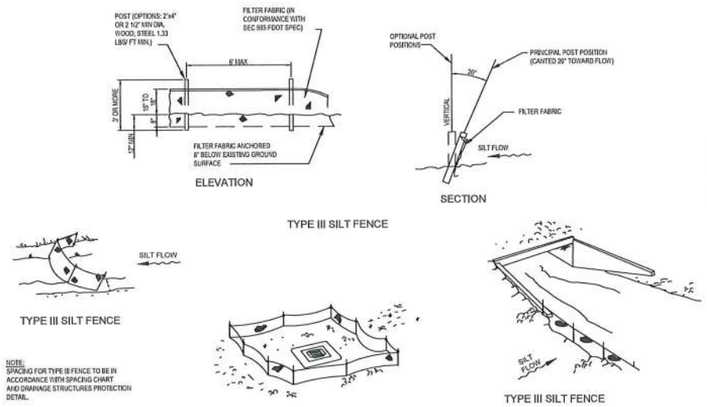
SILT FENCE

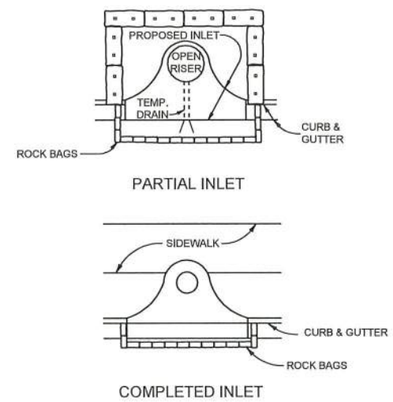


DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

SILT FENCE APPLICATIONS

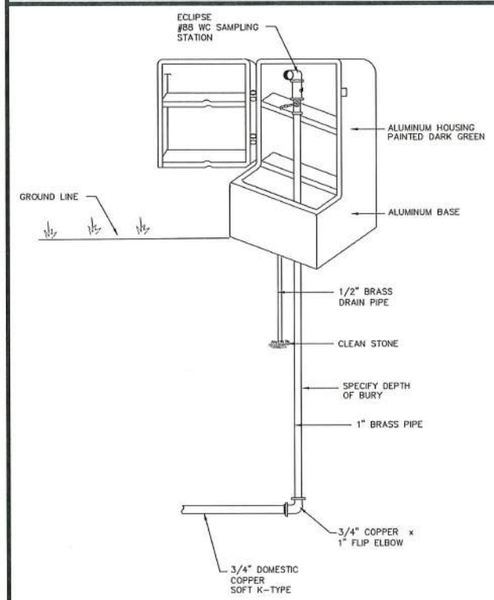
1 **DETAIL**
SCALE: NTS

INLET PROTECTION



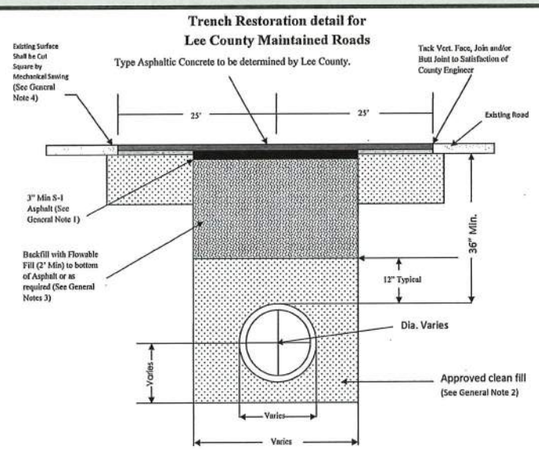
2 **DETAIL**
SCALE: NTS

BACTERIA SAMPLE POINT



3 **DETAIL**
SCALE: NTS

PAVEMENT RESTORATION DETAIL



Overlay with 1" S-3 asphalt or match existing, 25 feet in each direction with 2' wide X 3/4" deep milled butt joint at each end.

General Notes

1. The limits of Asphalt (overlay) replacement shall be determined by Lee County
2. For gravity pipe lines, may use rock 1' (ft) above pipe per FDOT specifications.
3. Controlled Low Strength Materials (CLSM)
4. Using a 3/4" Thick X 4' Wide Butt Joint at Each End
5. Compaction must be performed in 6" lifts with densities every 12"

4 **DETAIL**
SCALE: NTS

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Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY
1	07/13/20	LDO COMMENT 06/16/2020	

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
EROSION CONTROL DETAILS

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-504

Bar Measures 1 inch

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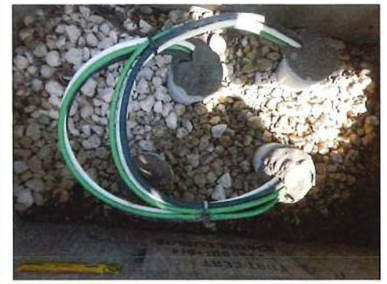
SUE PICTURE 1

SUE PICTURE 2

SUE PICTURE 3



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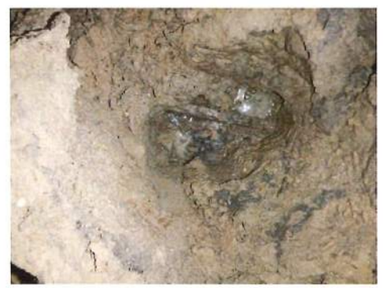

SUE PICTURE 14

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SUE PICTURE 20

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LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-504

Bar Measures 1 Inch

SUE PICTURE 21

SUE PICTURE 22

SUE PICTURE 23

SUE PICTURE 24

SUE PICTURE 25

SUE PICTURE 26

SUE PICTURE 27

SUE PICTURE 28

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SUE PICTURE 32

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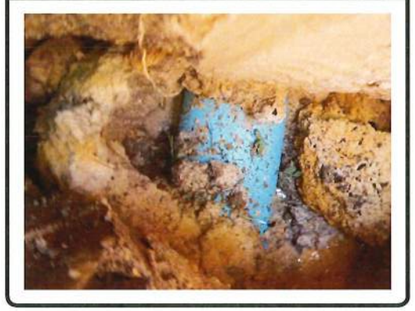
SUE PICTURE 35



SUE PICTURE 36

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SUE PICTURE 39

SUE PICTURE 40

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CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-506

Bar Measures 1 Inch

SUE PICTURE 41

SUE PICTURE 42

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SUE PICTURE 47

SUE PICTURE 48

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SUE PICTURE 50

SUE PICTURE 51

SUE PICTURE 52

SUE PICTURE 53

SUE PICTURE 54

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SUE PICTURE 57

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SUE PICTURE 60

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WATER MAIN IMPROVEMENTS
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Checked By:	AS

C-507

Bar Measures 1 inch

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SUE PICTURE 70

SUE PICTURE 71

SUE PICTURE 72

SUE PICTURE 73

SUE PICTURE 74

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SUE PICTURE 79

SUE PICTURE 80

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C-508

Bar Measures 1 Inch

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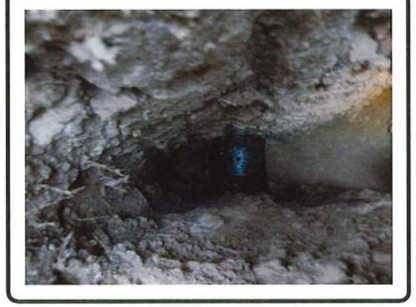

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SUE PICTURE 100

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Estero, Florida 33928
Engineering Business No. 2429

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LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-509

Bar Measures 1 inch

SUE PICTURE 101

SUE PICTURE 102

SUE PICTURE 103

SUE PICTURE 104

SUE PICTURE 105

SUE PICTURE 106

SUE PICTURE 107

SUE PICTURE 108

SUE PICTURE 109

SUE PICTURE 110

SUE PICTURE 111

SUE PICTURE 112

SUE PICTURE 113

SUE PICTURE 114

SUE PICTURE 115

SUE PICTURE 116

SUE PICTURE 117

SUE PICTURE 118

SUE PICTURE 119

SUE PICTURE 120

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Estero, Florida 33928
Engineering Business No. 2429

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Bar Measures 1 inch

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SUE PICTURE 129

SUE PICTURE 130

SUE PICTURE 131

SUE PICTURE 132

SUE PICTURE 133

SUE PICTURE 134

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SUE PICTURE 137

SUE PICTURE 138

SUE PICTURE 139

SUE PICTURE 140

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Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-511

Bar Measures 1 inch

SUE PICTURE 141

SUE PICTURE 142

SUE PICTURE 143

SUE PICTURE 144

SUE PICTURE 145

SUE PICTURE 146

SUE PICTURE 147

SUE PICTURE 148

SUE PICTURE 149

SUE PICTURE 150

SUE PICTURE 151

SUE PICTURE 152

SUE PICTURE 153

SUE PICTURE 154

SUE PICTURE 155

SUE PICTURE 156

SUE PICTURE 157

SUE PICTURE 158

SUE PICTURE 159

SUE PICTURE 160

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Estero, Florida 33928
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LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-512

Bar Measures 1 inch

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SUE PICTURE 161

SUE PICTURE 162

SUE PICTURE 163

SUE PICTURE 164

SUE PICTURE 165

SUE PICTURE 166

SUE PICTURE 167

SUE PICTURE 168

SUE PICTURE 169

SUE PICTURE 170

SUE PICTURE 171

SUE PICTURE 172

SUE PICTURE 173

SUE PICTURE 174

SUE PICTURE 175

SUE PICTURE 176

SUE PICTURE 177

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STEVEN AGAPI, P.E.
LICENSE #89612
Tetra Tech Inc.
10600 Chevrolet Way, Ste. 102
Estero, Florida 33928
Engineering Business No. 2429

DATE

MARK	DATE	DESCRIPTION	BY

LEE COUNTY UTILITIES
CRYSTAL DRIVE
WATER MAIN IMPROVEMENTS
SOFT DIG PICTURES

Project No.:	200-01558-19001
Designed By:	AS
Drawn By:	WV
Checked By:	AS

C-513

Bar Measures 1 inch

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