



# UTILITIES, INC. OF FLORIDA SHADOW HILLS LONGWOOD INTERCONNECT SEMINOLE COUNTY, FLORIDA

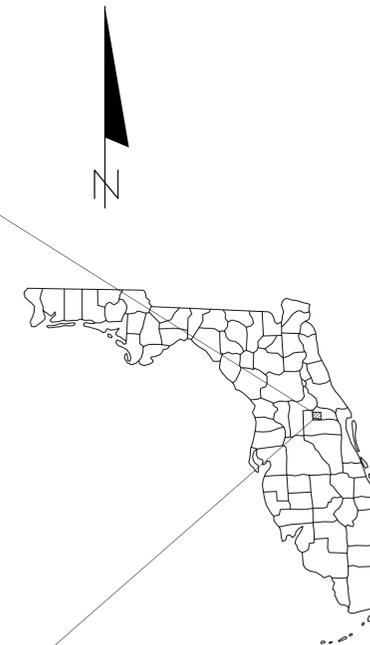
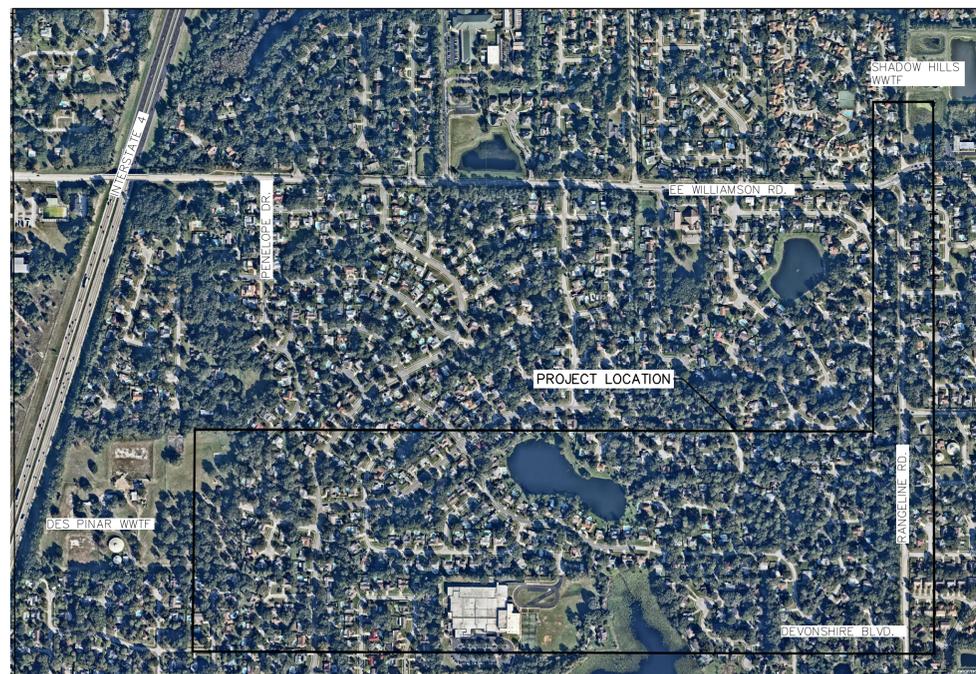
NOVEMBER 2016

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**OWNER:**  
UTILITIES, INC. OF FLORIDA  
200 WEATHERSFIELD AVE.  
ALTAMONTE SPRINGS, FL 32714  
CONTACT: MR. BRYAN GONGRE  
866-842-8432 EXT. 1360

**ENGINEER:**  
KIMLEY-HORN AND ASSOCIATES, INC.  
3660 MAGUIRE BLVD, SUITE 200  
ORLANDO, FLORIDA 32803  
CONTACT: STEPHEN N. ROMANO, P.E.  
407-427-1673



**PROJECT VICINITY MAP**  
N.T.S.

THE SITE CONSTRUCTION STAKEOUT SHALL BE PERFORMED UNDER THE DIRECTION OF A FLORIDA REGISTERED SURVEYOR. AUTOCAD FILES WILL BE FURNISHED TO AID IN THE SITE CONSTRUCTION STAKEOUT. ANY DISCREPANCIES FOUND BETWEEN AUTOCAD FILES AND SITE CONSTRUCTION PLANS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR CLARIFICATION PRIOR TO THAT STAKEOUT.

PREPARED BY  
**Kimley»Horn**

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No.	REVISIONS	DATE	BY

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STEPHEN N. ROMANO, P.E.  
FLORIDA LICENSE NUMBER:  
57579  
DATE: 11/7/16

DATE NOV, 2016
PROJECT NO. 149685007
SHEET NUMBER <b>1</b>

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**GENERAL PROJECT DATA**

FOR IDENTIFICATION OF CONTRACTUAL AGREEMENTS, THIS SET OF DRAWINGS IS DATED NOV 2016. ANY REVISIONS THEREAFTER WILL BE NOTED AND DATED ON THE AFFECTED DRAWING(S).

**EXISTING UTILITY LOCATION**

THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATIONS TO THESE UTILITIES WITH THE OWNER OF THE UTILITY. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY, WHETHER SHOWN ON THE PLANS OR LOCATED BY THE UTILITY COMPANY. ALL UTILITIES THAT INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED. ANY COST, DELAY OR INCONVENIENCE CAUSED TO THE CONTRACTOR BY THE RELOCATION OF VARIOUS UTILITIES SHALL BE INCIDENTAL TO THE CONTRACT, AND NO EXTRA COMPENSATION WILL BE ALLOWED.

A SINGLE POINT UTILITY LOCATION SERVICE HAS BEEN SET UP FOR PARTICIPATING UTILITIES. THE CONTRACTOR IS TO CONTACT THE SUNSHINE STATE ONE CALL CENTER AT LEAST TWO (2) AND NO MORE THAN FIVE (5) WORKING DAYS PRIOR TO THE SPECIFIC CONSTRUCTION ACTIVITY FOR FIELD LOCATION. NOTE THAT NOT ALL UTILITIES PARTICIPATE IN THIS PROGRAM. THE CONTRACTOR SHOULD CONTACT NON-PARTICIPATING UTILITIES SEPARATELY FOR THEIR FIELD LOCATION OF FACILITIES. PER FLORIDA STATUTE 553.851, THE CONTRACTOR OR EXCAVATOR IS REQUIRED TO NOTIFY THE GAS COMPANY TWO (2) WORKING DAYS PRIOR TO STARTING EXCAVATION.

**AS-BUILTS**

THE CONTRACTOR SHALL PROVIDE AS-BUILT SURVEYED INFORMATION WITH NORTHING AND EASTING DATA FOR ALL VALVES, FITTINGS, AND EVERY 100 FEET OF PIPE. VERTICAL DATA SHALL BE PROVIDED AT ALL VALVES.

**PERMITS AND PERMIT REQUIREMENTS**

THE CONTRACTOR SHALL OBTAIN FROM THE OWNER COPIES OF ALL REGULATORY AND LOCAL AGENCY PERMITS. THE CONTRACTOR SHALL BE EXPECTED TO REVIEW AND ABIDE BY ALL THE REQUIREMENTS AND LIMITATIONS SET FORTH IN THE PERMITS.

THE CONTRACTOR SHALL BE FURNISHED A COPY OF THE N.P.D.E.S. NOTICE OF INTENT APPLICATION AND REPORT WHICH WAS FURNISHED TO EPA BY THE OWNER. THE CONTRACTOR SHALL REVIEW THE CONTENTS OF THAT SUBMITTAL INCLUDING CONSTRUCTION COMMENCEMENT AND CESSATION DATES AND ALL OTHER ELEMENTS OF THE SUBMITTAL. HE SHALL EXECUTE AND FILE AN N.O.I. TO EPA AS THE ENTITY RESPONSIBLE FOR OPERATING AND MAINTAINING THE EROSION PROTECTION SYSTEM DURING CONSTRUCTION, NOTING ANY CHANGES AND/OR MODIFICATIONS AND/OR AGREEING TO THE ELEMENTS OF THE ORIGINAL SUBMITTAL. HE SHALL SUBMIT THIS AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL KEEP ON-SITE A COPY OF THE WATER MANAGEMENT DISTRICT AND N.P.D.E.S. PERMITS ISSUED TOGETHER WITH THE INSPECTION REPORTS AND CURRENT PLANS, INCLUDING ANY MODIFICATIONS REQUIRED. HE SHALL ALSO PROVIDE A NOTICE OF TERMINATION TO THE N.P.D.E.S. PERMITTING AUTHORITY AT THE CONCLUSION OF THE PROJECT THAT THE DISCHARGE AND EROSION PROTECTION DEVICE AS SHOWN ON THE PLANS HAVE BEEN IMPLEMENTED AND MAINTAINED THROUGHOUT CONSTRUCTION.

**QUALITY CONTROL TESTING REQUIREMENTS**

ALL TESTING RESULTS SHALL BE PROVIDED TO THE OWNER/OPERATOR, COUNTY, AND THE ENGINEER. TESTING REQUIREMENTS ARE TO BE IN ACCORDANCE WITH THE OWNER/OPERATOR'S SPECIFICATIONS AND REQUIREMENTS. ALL TEST RESULTS SHALL BE PROVIDED (PASSING AND FAILING) ON A REGULAR AND IMMEDIATE BASIS. CONTRACTOR SHALL PROVIDE TESTING SERVICES THROUGH A FLORIDA LICENSED GEOTECHNICAL ENGINEERING FIRM ACCEPTABLE TO THE OWNER AND ENGINEER. NO TESTING TO BE SCHEDULED ON MONDAY OR FRIDAY.

**SHOP DRAWINGS**

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE MATERIALS REQUIRED FOR CONSTRUCTION.

**EARTHWORK**

**EARTHWORK QUANTITIES**

THE CONTRACTOR SHALL PERFORM HIS OWN INVESTIGATIONS AND CALCULATIONS AS NECESSARY TO ASSURE HIMSELF OF EARTHWORK QUANTITIES. THERE IS NO IMPLICATION THAT EARTHWORK BALANCES AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY IMPORT FILL NEEDED, OR FOR REMOVAL AND DISPOSAL OF EXCESS MATERIALS.

**EROSION CONTROL**

EROSION AND SILTATION CONTROL MEASURES ARE TO BE PROVIDED AND INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION. THESE MEASURES ARE TO BE INSPECTED BY THE CONTRACTOR ON A REGULAR BASIS AND ARE TO BE MAINTAINED OR REPAIRED ON AN IMMEDIATE BASIS, AS REQUIRED. REFER TO ST. JOHNS RIVER WATER MANAGEMENT DISTRICT PERMIT FOR ADDITIONAL REQUIREMENTS FOR EROSION CONTROL AND SURFACE DRAINAGE.

**WETLAND PROTECTION**

THE LIMITS OF THE ON-SITE WETLANDS HAVE BEEN PROVIDED TO THE CONTRACTOR ON THE CONSTRUCTION PLANS OR ON PERMIT MATERIALS. THE WETLANDS AREAS ARE TO BE PROTECTED FROM DISTURBANCE AT ALL TIMES. CONTRACTOR SHALL PROVIDE EROSION, SILTATION, AND DIVERSION MEASURES PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN A COPY OF EACH PERMIT RELATING TO WETLANDS AND ADHERE TO ALL PROVISIONS AND CONDITIONS THERETO.

**LIMITS OF DISTURBANCE**

AT NO TIME SHALL THE CONTRACTOR DISTURB SURROUNDING PROPERTIES OR TRAVEL ON SURROUNDING PROPERTIES WITHOUT WRITTEN CONSENT FROM THE PROPERTY OWNER. REPAIR OR RECONSTRUCTION OF DAMAGED AREAS ON SURROUNDING PROPERTIES SHALL BE PERFORMED BY THE CONTRACTOR ON AN IMMEDIATE BASIS. ALL COSTS FOR REPAIRS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND NO EXTRA COMPENSATION SHALL BE PROVIDED.

**TREE REMOVAL**

THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER WHEN ALL WORK IS LAID OUT (SURVEY STAKED), SO THAT A DETERMINATION MAY BE MADE OF SPECIFIC TREES TO BE REMOVED. NO TREES SHOWN ON THE CONSTRUCTION PLANS AS BEING SAVED SHALL BE REMOVED WITHOUT PERMISSION FROM THE OWNER AND ENGINEER.

**CLEARING AND GRUBBING**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING AND GRUBBING FOR SITE CONSTRUCTION INCLUDING CLEARING FOR PAVING, UTILITIES, DRAINAGE FACILITIES AND BUILDING CONSTRUCTION. SEE PLANS FOR LIMITS OF CLEARING AND GRUBBING. ALL AREAS TO BE CLEARED SHALL BE FIELD STAKED AND REVIEWED BY THE OWNER AND ENGINEER PRIOR TO ANY CONSTRUCTION.

**MATERIAL STORAGE / DEBRIS REMOVAL**

ALL MATERIALS EXCAVATED SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STOCKPILED AT ON-SITE LOCATIONS AS SPECIFIED BY THE OWNER. MATERIALS SHALL BE STOCKPILED SEPARATELY AS TO USABLE (NON ORGANIC) FILL STOCKPILES AND ORGANIC (MUCK) STOCKPILES IF MUCK IS ENCOUNTERED. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL UNSUITABLE FILL MATERIALS FROM THE SITE. ALL CLAY ENCOUNTERED SHALL BE EXCAVATED OUT AND REPLACED WITH CLEAN GRANULAR FILL MATERIALS.

**FILL MATERIAL**

ALL FILL MATERIALS SHALL NOT CONTAIN MUCK, STUMPS, ROOTS, BRUSH, VEGETATIVE MATTER, RUBBISH OR OTHER MATERIAL THAT WILL NOT COMPACT INTO A SUITABLE AND ENDURING BACKFILL. FILL SHALL BE CLEAN, NON-ORGANIC, GRANULAR MATERIAL WITH NOT MORE THAN 10% PASSING THE NO. 200 SIEVE.

**COMPACTION**

FILL MATERIALS PLACED UNDER ROADWAYS SHALL BE COMPACTED TO AT LEAST 98% OF THE MAXIMUM DENSITY AS SPECIFIED IN AASHTO T-180. ALL OTHER FILL AREAS ARE TO BE COMPACTED TO AT LEAST 95% MAXIMUM DENSITY AS SPECIFIED IN AASHTO T-180. FILL MATERIALS SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 12" LIFTS. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND OWNER WITH ALL (PASSING AND FAILING) TESTING RESULTS. RESULTS SHALL BE PROVIDED ON A TIMELY AND REGULAR BASIS PRIOR TO CONTRACTOR'S PAY REQUEST SUBMITTAL FOR THE AFFECTED WORK.

**FORCE MAIN**

**OWNER/OPERATOR**

THE ENTITY THAT WILL OWN, OPERATE AND MAINTAIN THE FORCE MAIN SHOWN ON THESE PLANS IS UTILITIES INC. OF FLORIDA. THE CONTRACTOR SHALL BE EXPECTED TO MEET ALL THE REQUIREMENTS OF THAT ENTITY.

**MATERIALS**

SANITARY SEWER FORCE MAIN SHALL BE POLYVINYL CHLORIDE PLASTIC PIPE (PVC) AND SHALL CONFORM TO ASTM D2241 PLASTIC PIPE (SD PR & CLASS T), ASTM 1784, TYPE I, 2000 PSI DESIGN STRESS. THE PIPE SHALL BE ANSI/AWWA C900, WITH MARKINGS ON EACH SECTION SHOWING CONFORMANCE WITH THE ABOVE SPECIFICATION. JOINTS SHALL BE ELASTOMERIC RUBBER GASKETED CONFORMING TO ASTM D3139 DR 18 PIPE.

FITTINGS FOR FORCE MAIN SHALL BE MECHANICAL JOINT, DUCTILE IRON CONFORMING TO ANSI/AWWA C110/A21.10 350 PSI MINIMUM PRESSURE RATING. FITTINGS SHALL BE POLYETHYLENE LINED (MIN. 30 MILS CONFORMING TO ASTM D-1248).

ALL PLUGS, CAPS, TEES, VALVES, BENDS, ETC., SHALL BE RESTRAINED JOINTS OR THRUST BLOCKED (RESTRAINED JOINT PREFERRED) PER DETAILS ON UTILITY SHEETS. THREE FOOT MINIMUM COVER OVER FORCE MAIN.

STANDARD PLUG VALVES SHALL BE MANUFACTURED BY DEZURIK CORP., PRATT, DRESSER, HOMESTEAD INDUSTRIES, OR APPROVED EQUAL.

VALVES SHALL BE FURNISHED WITH A REPLACEABLE CHEVRON PACKING, CAPABLE OF BEING REPACKED WITH THE LINE UNDER PRESSURE.

VALVES 4 INCHES IN DIAMETER AND SMALLER SHALL BE WRENCH NUT OPERATED. VALVES LARGER THAN 4 INCHES SHALL BE WORM GEAR OPERATED, EXCEPT WHERE AUTOMATIC OPERATION IS SPECIFIED.

AIR RELEASE VALVE DESIGNED FOR SEWAGE SERVICE SHALL BE INSTALLED IN THE TOPS OF PIPES AS INDICATED ON THE DRAWINGS. VALVES SHALL BE DESIGNED TO PERMIT MANUAL RELEASE OF AIR FROM AN EMPTY PIPE DURING FILLING AND SHALL BE CAPABLE OF DISCHARGING ACCUMULATED AIR IN THE LINE WHILE THE LINE IS IN OPERATION AND UNDER PRESSURE. VALVES SHALL BE CAPABLE OF WITHSTANDING OPERATING PRESSURES OF 50 PSI. VALVES SHALL BE VENTED TO THE ATMOSPHERE. THE VALVES SHALL BE VALMATIC, OR APPROVED EQUAL.

CHECK VALVES SHALL BE OF THE WEIGHT AND LEVER TYPE, RESILIENT DISK, GRAY IRON, BRONZE TRIM, HORIZONTAL MOUNTED. VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C508 WITH FLANGED CONNECTIONS. VALVES SHALL HAVE A WORKING PRESSURE OF 200 PSI FOR VALVES 2"-12". VALVES SHALL BE DEZURIK, MUELLER, OR APPROVED EQUAL.

**CONSTRUCTION METHODS**

TRENCHING SHALL BE IN ACCORDANCE WITH THE TRENCHING DETAILS PROVIDED ON THE CONSTRUCTION PLANS.

COMPACTED BACKFILL FOR ALL PIPE SHALL BE TO 98% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180 FOR UNDER ROADWAYS. OTHER COMPACTION OF BACKFILL SHALL BE TO THE 95% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.

INSTALLATION OF THE SANITARY SEWER FORCE MAIN SHALL BE IN CONFORMANCE WITH ASTM D2774-72 (LATEST EDITION).

MINIMUM COVER OVER ALL PIPES SHALL BE 36" FROM TOP OF PIPE TO FINISHED GRADE. SEE PLAN AND PROFILE SHEETS FOR REQUIRED DEPTH.

THE FORCE MAIN SHALL BE INSTALLED AS NOTED ON THE PLANS. WHERE APPLICABLE, A LATERAL SEPARATION OF AT LEAST 10' SHALL BE MAINTAINED BETWEEN WATER AND SEWER LINES. WHEN WATER AND SEWER LINES CROSS WITH LESS THAN AN 18" VERTICAL SEPARATION, THE PVC SEWER LINE SHALL BE ENCASED IN CONCRETE OR DUCTILE IRON PIPE USED IN LIEU OF PVC PIPE FOR A DISTANCE OF 10' EITHER SIDE OF THE CROSSING.

ALL PLUGS, CAPS, TEES, BENDS, VALVES, ETC., SHALL BE PROVIDED WITH RESTRAINED JOINTS OR THRUST BLOCKS (RESTRAINED JOINTS PREFERRED) PER UTILITY DETAIL SHEET.

GREEN MAGNETIC INDICATOR TAPE SHALL BE BURIED IN THE FORCE MAIN TRENCH 18" DIRECTLY ABOVE THE FORCE MAIN. A CONTINUOUS COPPER DETECTOR WIRE SHALL BE ATTACHED TO THE PIPE AND VALVES AS SHOWN ON THE UTILITY SHEETS.

CONNECTIONS TO MANHOLE WITH FORCE MAINS SHALL BE MADE BY CORE BORE AND LINK SEAL OR OTHER APPROVED CONNECTION. CONNECTIONS SHALL BE MADE WATERTIGHT AND BE INSTALLED ACCORDING TO THE MANUFACTURERS' RECOMMENDATIONS.

**TESTING**

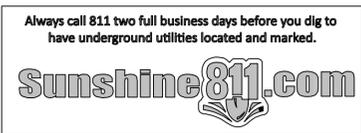
FORCE MAIN SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH AWWA STANDARD M23. FORCE MAIN SYSTEM SHALL BE TESTED FOR TWO (2) HOURS AT 100 PSI. SEVENTY-TWO (72) HOURS WRITTEN ADVANCE NOTIFICATION TO THE ENGINEER AND THE UTILITY COMPANY OF THE TESTING WILL BE REQUIRED. NO TESTING ON MONDAY OR FRIDAY. THE CONTRACTOR SHALL PERFORM SATISFACTORY PROTESTING PRIOR TO NOTIFICATION.

**AS-BUILT DRAWINGS**

THE CONTRACTOR SHALL PROVIDE VERTICAL AND HORIZONTAL "AS-BUILT" INFORMATION RELATIVE TO ALL CONSTRUCTED UTILITIES AND STRUCTURES.

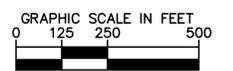
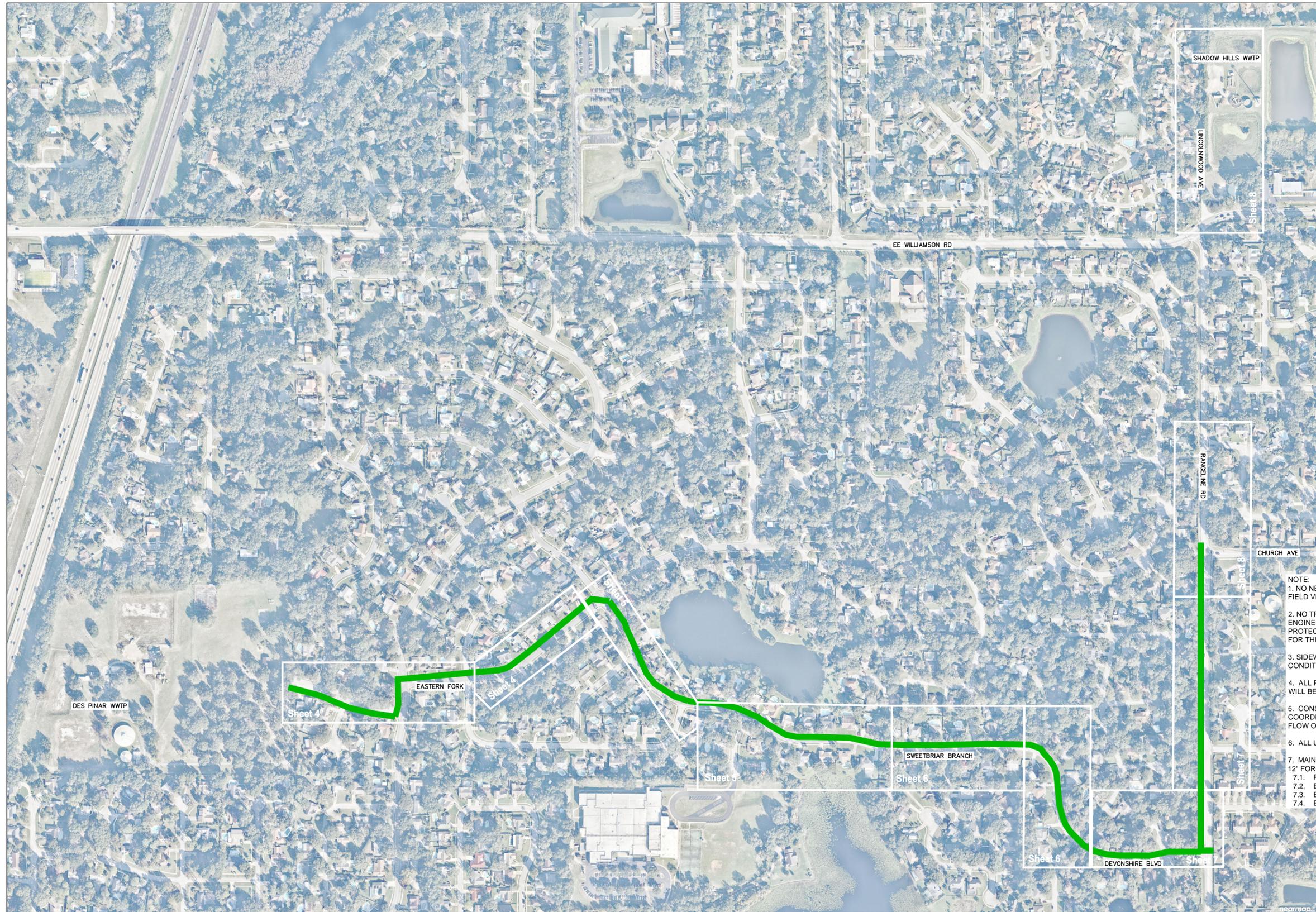
AS-BUILT INFORMATION FOR THE FORCE MAIN SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING

1. LOCATION OF ALL VALVES, FITTINGS, ETC.
2. LOCATION OF THE FORCE MAIN TIED HORIZONTALLY TO THE BACK OF CURB OR EDGE OF PAVEMENT.
3. CERTIFICATION AS TO THE SYSTEM MEETING THE MINIMUM COVER REQUIREMENTS.
4. HORIZONTAL AND VERTICAL DATA FOR ANY CONSTRUCTION WHICH DEVIATES FROM THE APPROVED ENGINEERING DRAWINGS.



				<p>© 2016 KIMLEY-HORN AND ASSOCIATES, INC. 3660 MAGUIRE BOULEVARD, SUITE 200, ORLANDO, FL 32803 PHONE: 407-898-1511 WWW.KIMLEY-HORN.COM CA 00000696</p>	<p>KHA PROJECT 149685007</p> <p>DATE 11/7/16</p> <p>SCALE AS SHOWN</p> <p>DESIGNED BY SNR</p> <p>DRAWN BY JIH</p> <p>CHECKED BY NEQ</p>	<p>SHADOW HILLS LONGWOOD INTERCONNECT</p>	<p>LICENSED PROFESSIONAL</p> <p>STEPHEN N. ROMANO, P.E.</p> <p>57579</p> <p>DATE: -----</p>	<p>GENERAL NOTES</p>	<p>SHEET NUMBER</p> <p>2</p>
No.	REVISIONS	DATE	BY						

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**LEGEND**

- EXISTING WATER MAIN
- FM--- EXISTING FORCE MAIN
- S--- EXISTING SANITARY SEWER
- GAS--- EXISTING GAS MAIN
- SS--- EXISTING STORM SEWER
- CBL--- EXISTING CABLE LINE
- PROPOSED FORCE MAIN
- ⊗ AIR RELEASE VALVE
- ⊕ PLUG VALVE

- NOTE:**
1. NO NEW SURVEY WAS OBTAIN FOR THIS PROJECT. CONTRACTOR MUST FIELD VERIFY LOCATIONS OF EXISTING UTILITIES
  2. NO TREES SHALL BE REMOVED UNLESS SPECIFICALLY ALLOWED BY THE ENGINEER AND COUNTY R.O.W. PERMIT. ALIGNMENT MAY BE ADJUSTED TO PROTECT EXIST. TREES. NO ADDITIONAL COMPENSATION WILL BE MADE FOR THESE ADJUSTMENTS.
  3. SIDEWALK MAY BE REMOVED AND REPLACED TO PRE CONSTRUCTION CONDITIONS AS NECESSARY.
  4. ALL PROPERTY OWNERS WHOSE DRIVEWAYS REQUIRE REPLACEMENT WILL BE INDIVIDUALLY CONTACTED PRIOR TO CONSTRUCTION.
  5. CONSTRUCTION ACTIVITIES WITHIN 2 MILES OF A SCHOOL WILL BE COORDINATED WITH THE SCHOOL TO ENSURE THE SAFE CONTINUOUS FLOW OF PROPER PEDESTRIAN TRAFFIC FOR SCHOOL CHILDREN.
  6. ALL UTILITIES WILL BE PHYSICALLY VERIFIED PRIOR TO CONSTRUCTION.
  7. MAINTAIN MINIMUM 1' HORIZONTAL SEPARATION BETWEEN PROPOSED 12" FORCE MAIN AND THE FOLLOWING:
    - 7.1. RIGHT-OF-WAY LINE
    - 7.2. EDGE OF CURB
    - 7.3. EXISTING GAS MAIN
    - 7.4. EXISTING SANITARY SEWER

Always call 811 two full business days before you dig to have underground utilities located and marked.

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PHONE: 407-898-1511  
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KHA PROJECT 149685007
DATE 11/7/16
SCALE AS SHOWN
DESIGNED BY SNR
DRAWN BY JIH
CHECKED BY NEQ

**SHADOW HILLS  
LONGWOOD INTERCONNECT**

LICENSED PROFESSIONAL
STEPHEN N. ROMANO, P.E.
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DATE: _____

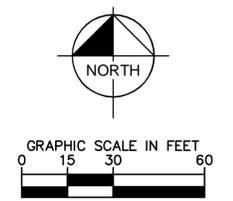
**KEY SHEET**

SHEET NUMBER
3

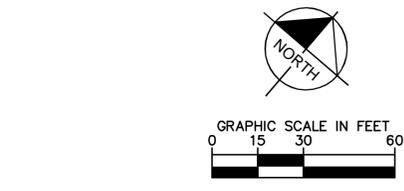
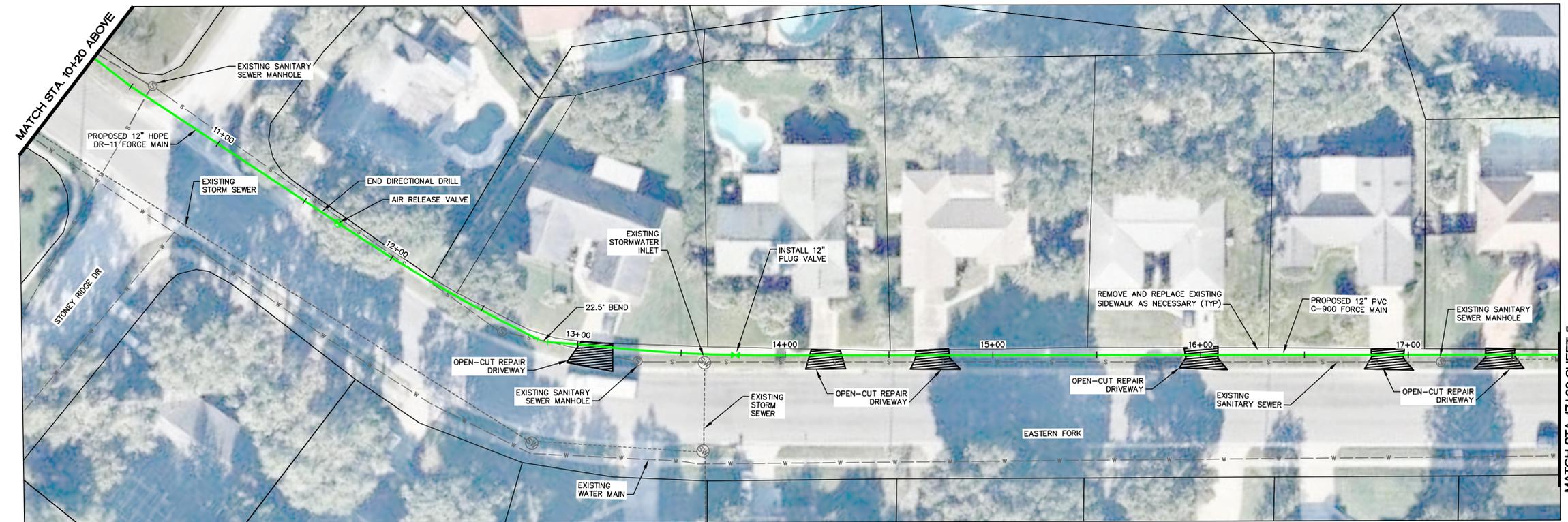
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    - 7.1. RIGHT-OF-WAY LINE
    - 7.2. EDGE OF CURB
    - 7.3. EXISTING GAS MAIN
    - 7.4. EXISTING SANITARY SEWER



MATCH STA. 10+20 THIS SHEET BELOW



- LEGEND**
- EXISTING WATER MAIN
  - FM --- EXISTING FORCE MAIN
  - SS --- EXISTING SANITARY SEWER
  - GAS --- EXISTING GAS MAIN
  - SS --- EXISTING STORM SEWER
  - CB --- EXISTING CABLE LINE
  - PROPOSED FORCE MAIN
  - ⊗ AIR RELEASE VALVE
  - ⊕ PLUG VALVE

MATCH STA. 17+60 SHEET 5

1	ADDENDUM NO 1	11/18/16	RL
No.	REVISIONS	DATE	BY

**Kimley»Horn**

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KHA PROJECT	149685007
DATE	11/7/16
SCALE	AS SHOWN
DESIGNED BY	SNR
DRAWN BY	JIH
CHECKED BY	NEQ

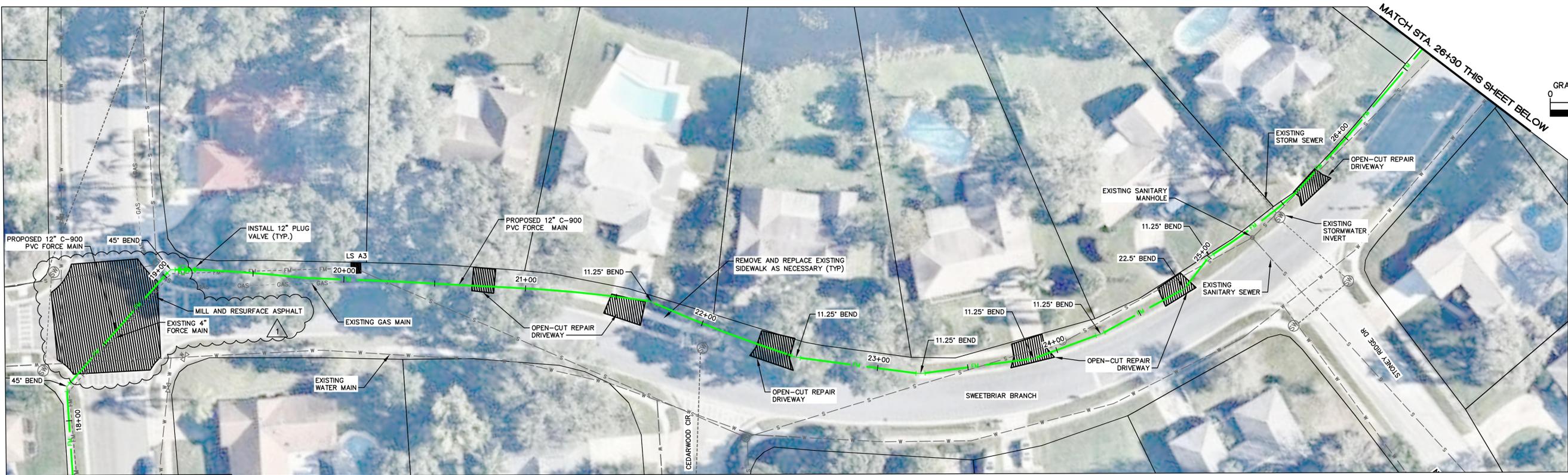
**SHADOW HILLS  
LONGWOOD INTERCONNECT**

LICENSED PROFESSIONAL	STEPHEN N. ROMANO, P.E.
57579	
DATE:	----

STA 00+00 TO 17+60

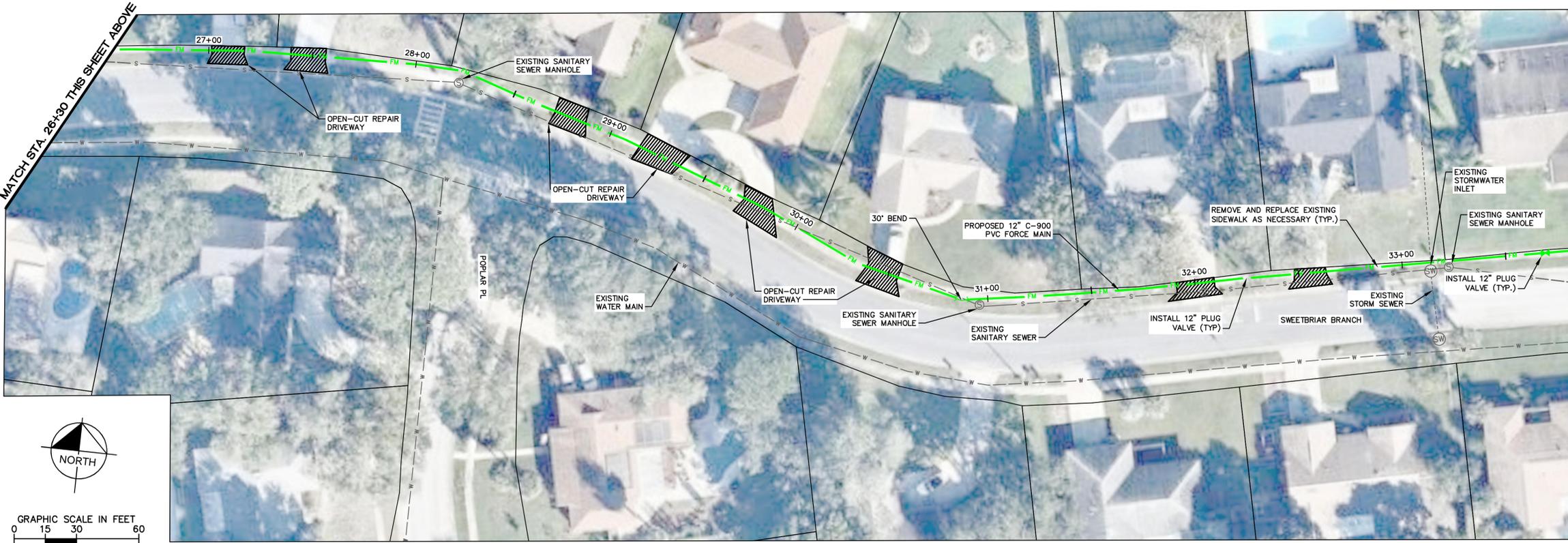
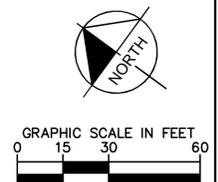
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MATCH STA. 17+60 SHEET 4

MATCH STA. 26+30 THIS SHEET BELOW



MATCH STA. 26+30 THIS SHEET ABOVE

MATCH STA. 33+80 SHEET 6

- LEGEND**
- EXISTING WATER MAIN
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  7. MAINTAIN MINIMUM 1' HORIZONTAL SEPARATION BETWEEN PROPOSED 12" FORCE MAIN AND THE FOLLOWING:
    - 7.1. RIGHT-OF-WAY LINE
    - 7.2. EDGE OF CURB
    - 7.3. EXISTING GAS MAIN
    - 7.4. EXISTING SANITARY SEWER

No.	ADDENDUM NO 1	REVISIONS	DATE	BY
1			11/18/16	RLL

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DATE	11/7/16
SCALE	AS SHOWN
DESIGNED BY	SNR
DRAWN BY	JIH
CHECKED BY	NEQ

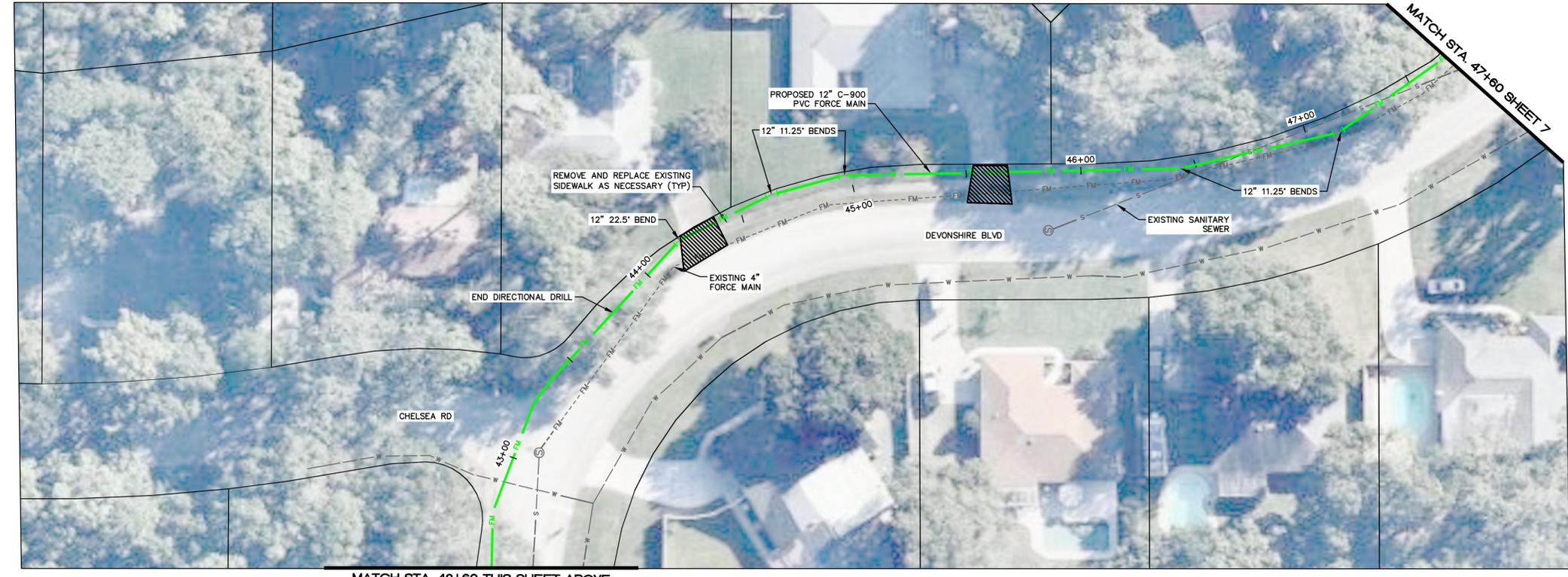
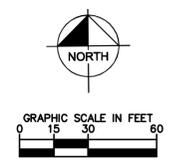
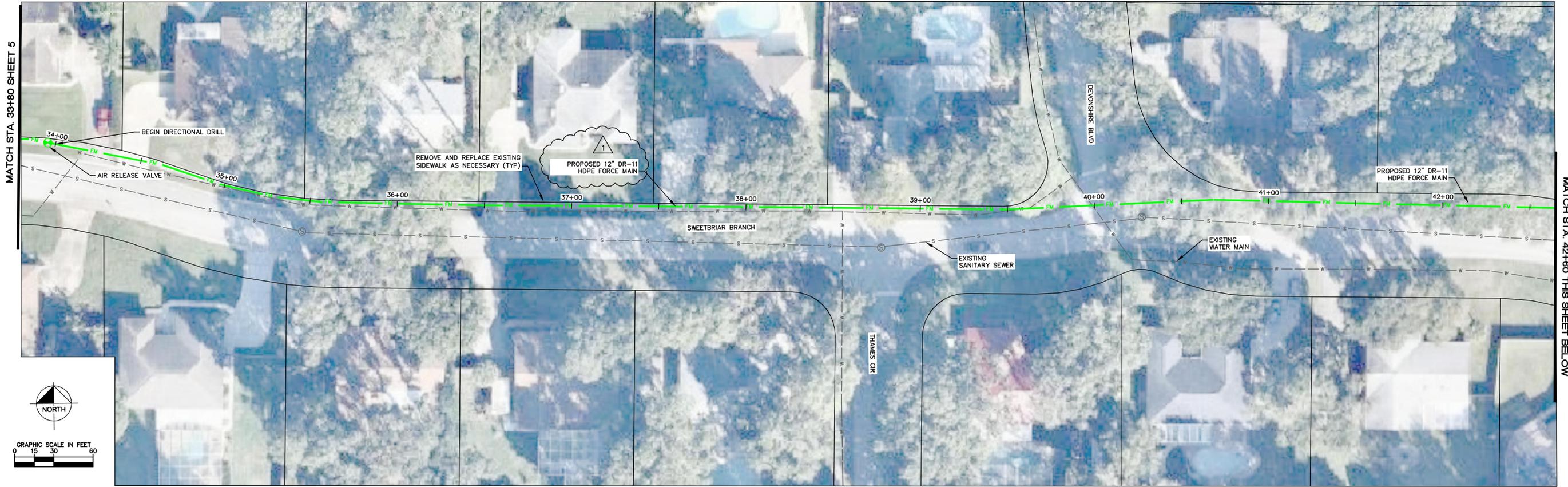
**SHADOW HILLS  
LONGWOOD INTERCONNECT**

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57579	
DATE:	

STA 17+60 TO 33+80

SHEET NUMBER	5
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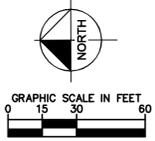


**LEGEND**

- W--- EXISTING WATER MAIN
- FM--- EXISTING FORCE MAIN
- S--- EXISTING SANITARY SEWER
- GAS--- EXISTING GAS MAIN
- S--- EXISTING STORM SEWER
- CBL--- EXISTING CABLE LINE
- FM--- PROPOSED FORCE MAIN
- AIR RELEASE VALVE
- PLUG VALVE

**NOTE:**

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**SHADOW HILLS  
LONGWOOD INTERCONNECT**

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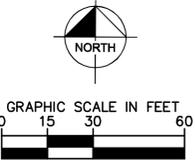
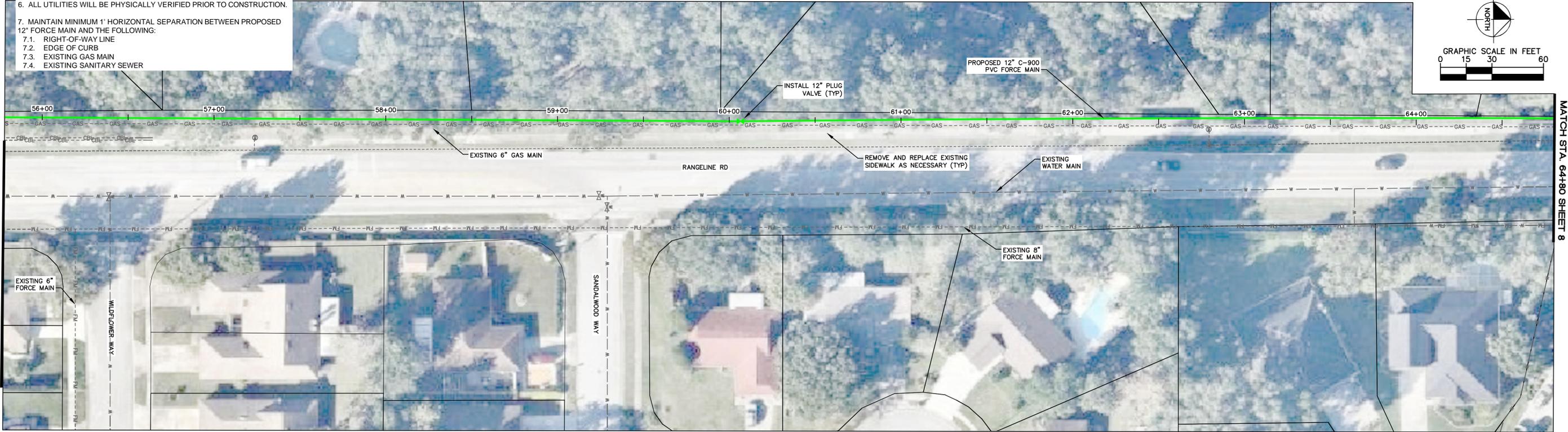
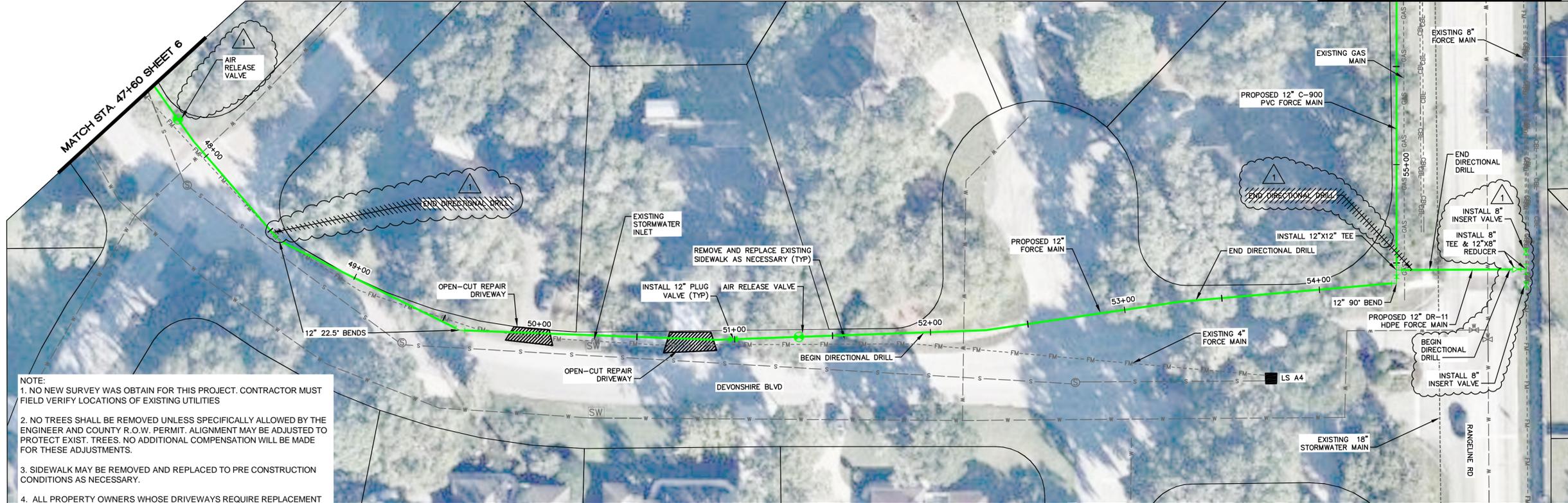
**STA 33+80 TO 47+60**

SHEET NUMBER  
**6**

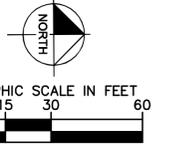
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    - EXISTING SANITARY SEWER

- RIGHT-OF-WAY LINE
- EDGE OF CURB
- EXISTING GAS MAIN
- EXISTING SANITARY SEWER



- LEGEND**
- EXISTING WATER MAIN
  - FM --- EXISTING FORCE MAIN
  - SS --- EXISTING SANITARY SEWER
  - GAS --- EXISTING GAS MAIN
  - S --- EXISTING STORM SEWER
  - CBL --- EXISTING CABLE LINE
  - FM --- PROPOSED FORCE MAIN
  - ⊗ AIR RELEASE VALVE
  - ⊕ PLUG VALVE



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SCALE AS SHOWN  
DESIGNED BY SNR  
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**SHADOW HILLS  
LONGWOOD INTERCONNECT**

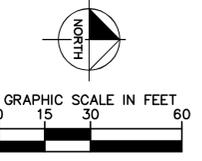
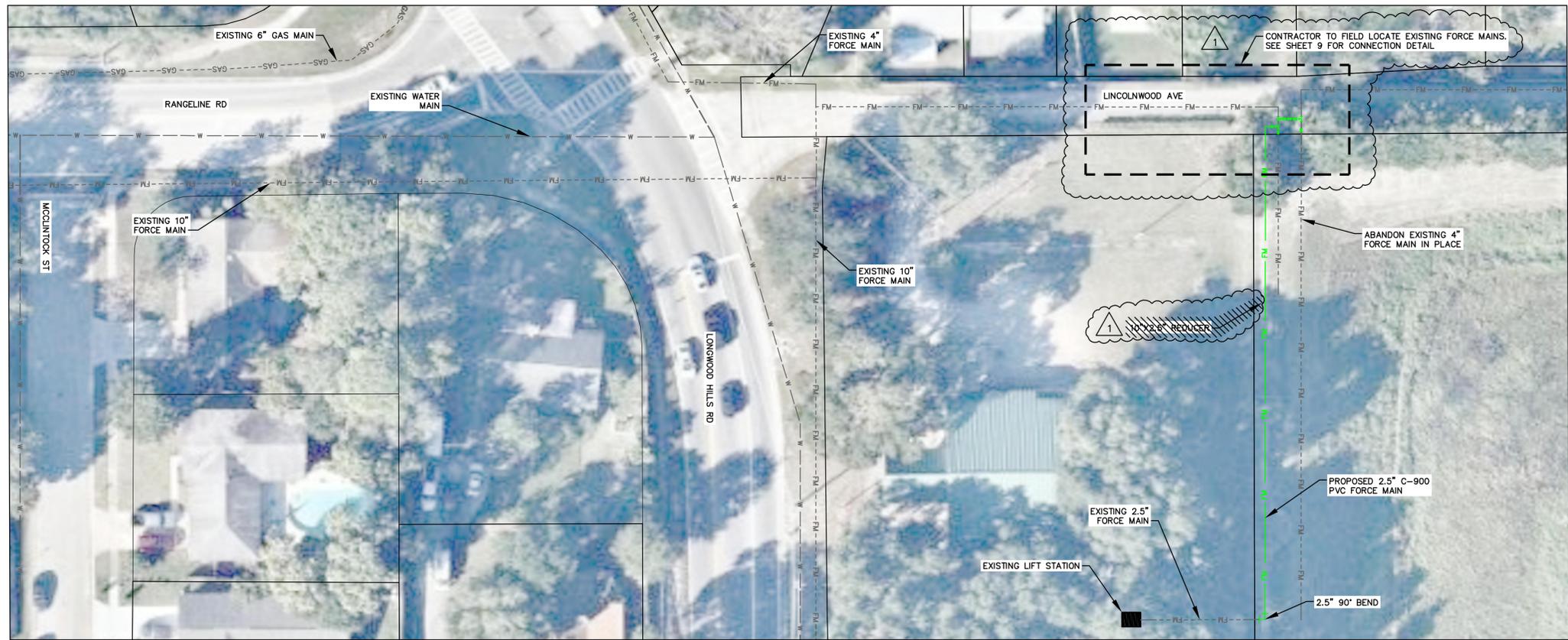
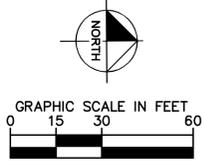
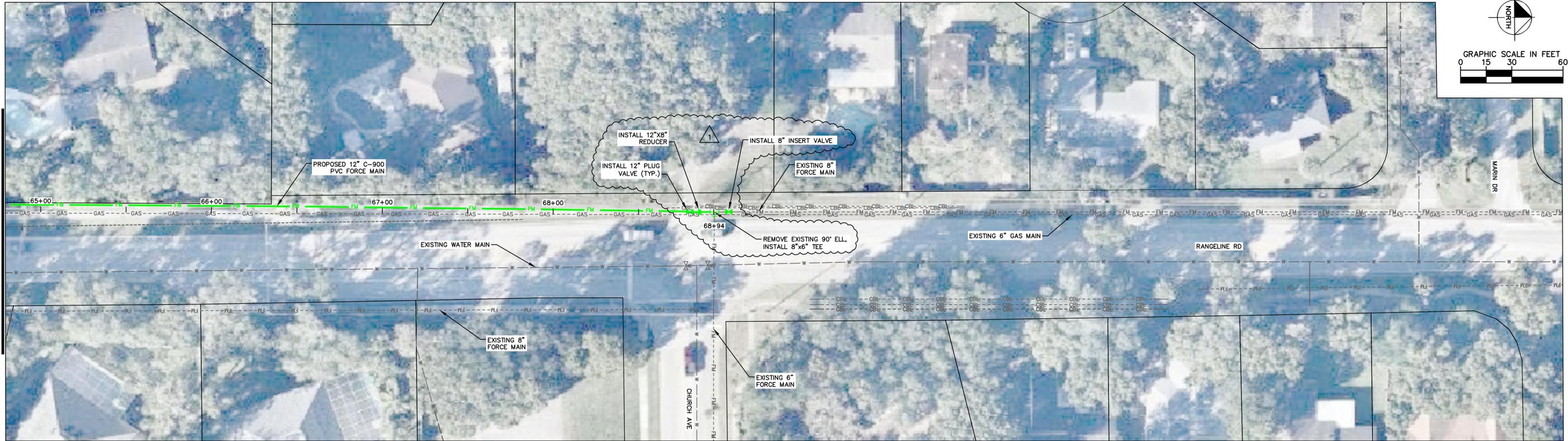
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MATCH STA. 64+80 SHEET 7



**LEGEND**

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- FM --- EXISTING FORCE MAIN
- S --- EXISTING SANITARY SEWER
- GAS --- EXISTING GAS MAIN
- --- EXISTING STORM SEWER
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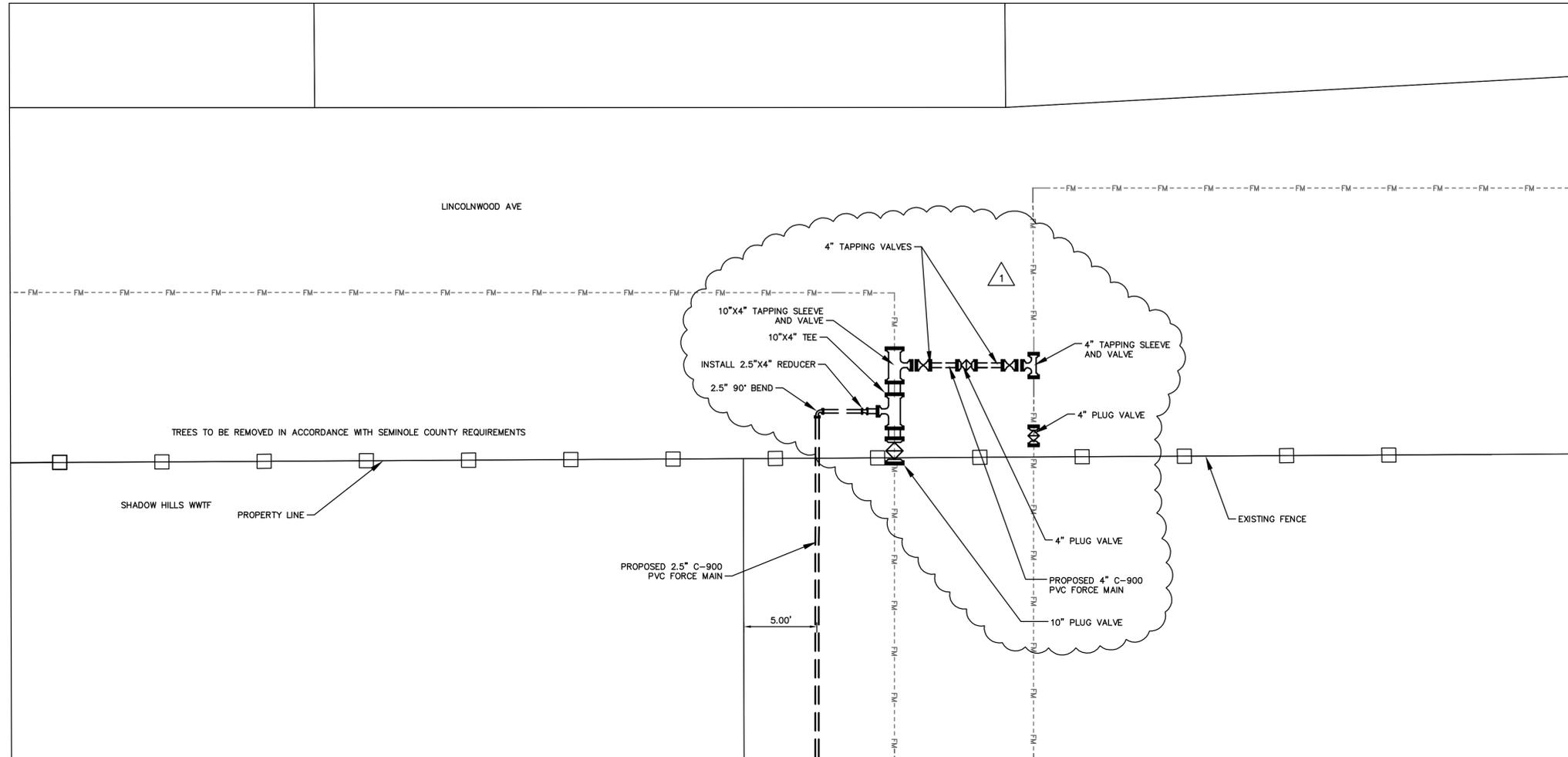
SHADOW HILLS  
LONGWOOD INTERCONNECT

LICENSED PROFESSIONAL
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DATE: _____

STA 64+80 TO 68+94 &  
SHADOW HILLS TIE-IN

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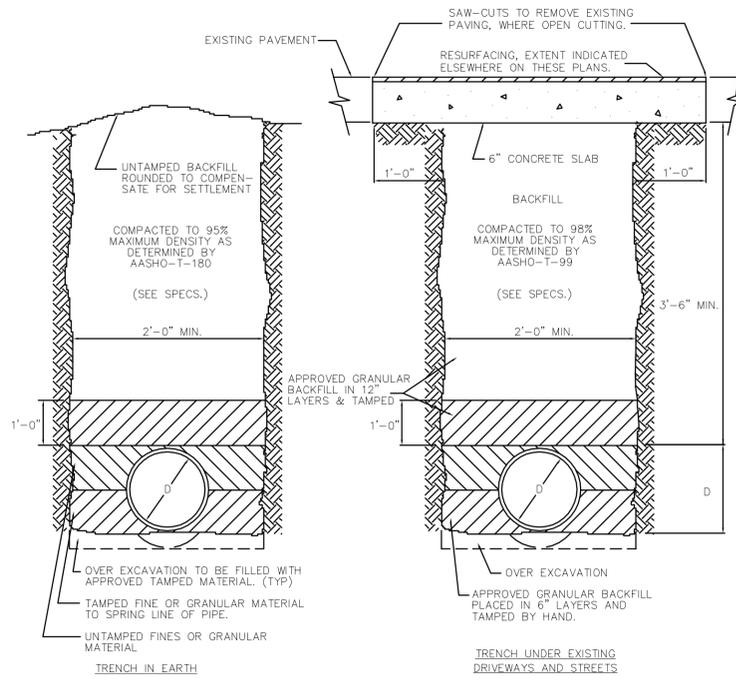
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SHADOW HILLS TIE-IN  
DETAIL

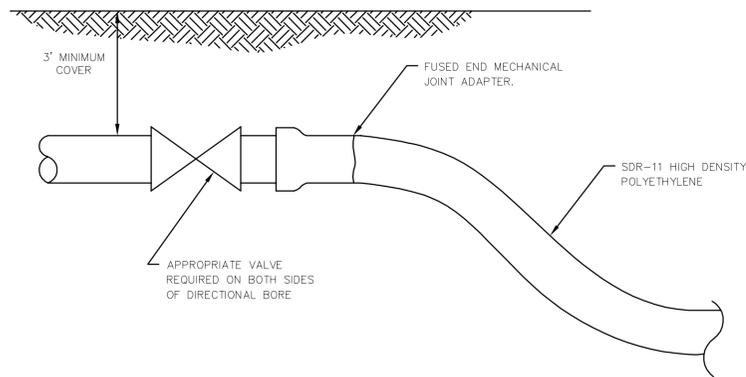
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- NOTE**
- TRENCHES SHALL BE AS NARROW AS POSSIBLE TO ALLOW FOR SAFE AND PROPER PIPE INSTALLATION. TRENCH SIDES SHALL BE VERTICAL TO A POINT 1'-0" ABOVE THE TOP OF THE PIPE. ABOVE THIS POINT SLOPED SIDES MAY BE USED IF CONDITIONS PERMIT, BUT SHOULD BE KEPT AS NEARLY VERTICAL AS POSSIBLE.
  - FOR TRENCH IN CINDER FILLS, GARBAGE DUMPS, SALT MARSHES, MUCK SOILS OR PLACES WHERE HARMFUL CORROSIVE CONDITIONS EXIST, PIPE SHALL BE PROTECTED WITH AT LEAST 10" OF SAND OR LIMESTONE SCREENINGS ON ALL SIDES AND TAMPED BY HAND IN 6" LAYERS. SEE SPECIFICATIONS. NO ADDITIONAL COMPENSATION FOR CORROSION PROTECTION OF A PIPE WILL BE ALLOWED.

**TRENCH DETAILS**



- NOTES:**
- DEPTH OF DIRECTIONAL BORE SHALL BE APPROVED ON A CASE BY CASE BASIS.
  - CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FDOT, FDEP, ACQE, AND WATER MANAGEMENT DISTRICT REQUIREMENTS.

**DIRECTIONAL BORE DETAILS**

PROPOSED UTILITY	MINIMUM HORIZONTAL AND VERTICAL SEPARATION REQUIREMENTS									
	POTABLE WATER		RECLAIMED WATER*		SANITARY SEWER FORCE MAIN		SANITARY SEWER GRAVITY MAIN		STORM SEWER OR VACUUM TYPE SANITARY SEWER	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
POTABLE WATER	---	---	3'	12"	6'	12"	6'	6" ABOVE 12" BELOW	3'	6" ABOVE 12" BELOW
RECLAIMED WATER	3'	12"	---	---	3'	12"	3'	12"	---	---
SANITARY SEWER FORCE MAIN	6'	12"	3'	12"	---	---	---	---	---	---
SANITARY SEWER GRAVITY MAIN	6'	6" ABOVE 12" BELOW	3'	12"	---	---	---	---	---	---
FIRE HYDRANTS W/ UNDERGROUND DRAINS	---	---	3'	---	6'	---	6'	---	3'	---

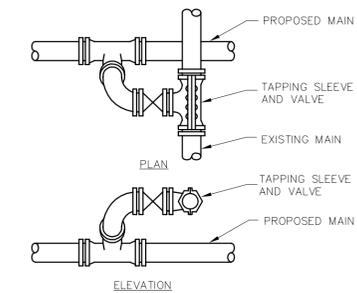
- THE TABLE REPRESENTS THE MINIMUM SEPARATION REQUIREMENTS AS DESCRIBED IN F.D.E.P. RULES PER THE FLORIDA ADMINISTRATION CODE (F.A.C.). THESE SEPARATION REQUIREMENTS SHALL APPLY BETWEEN NEWLY PROPOSED UTILITY LINES AND EXISTING OR PROPOSED UTILITY LINES.
- FOR THE PURPOSE OF THIS TABLE RECLAIMED WATER SHALL MEAN UNRESTRICTED PUBLIC ACCESS REUSE WATER AS DEFINED BY F.A.C. 62-610. OTHER TYPES OF RECLAIMED WATER ARE CONSIDERED RAW SEWAGE AND SEPARATION LISTED FOR SANITARY SEWER SHALL APPLY.
- ALL SEPARATION DISTANCES ARE FROM OUTSIDE OF PIPE TO OUTSIDE OF PIPE.
- THE MINIMUM HORIZONTAL SEPARATION BETWEEN POTABLE WATER AND GRAVITY SANITARY SEWER MAY BE REDUCED TO 3 FEET IF THE BOTTOM OF THE WATER MAIN IS LOCATED AT LEAST 6 INCHES ABOVE THE TOP OF THE GRAVITY SEWER.
- AT UTILITY CROSSINGS ONE FULL LENGTH OF WATER MAIN SHALL BE CENTERED ABOVE OR BELOW THE OTHER UTILITY PIPELINE MAXIMIZING THE SEPARATION OF PIPELINE JOINTS. ALTERNATIVELY, WATER MAIN JOINTS MUST BE:
  - AT LEAST 3' FROM ALL JOINTS IN VACUUM TYPE SANITARY SEWERS, STORM SEWERS, STORMWATER FORCE MAINS, OR UNRESTRICTED PUBLIC ACCESS RECLAIMED WATER.
  - AT LEAST 6' FROM ALL JOINTS IN GRAVITY OR PRESSURE SANITARY SEWERS, WASTEWATER FORCE MAINS, AND ALL OTHER TYPES OF RECLAIMED WATER.
- NO WATER PIPE SHALL PASS THROUGH OR BE CONSTRUCTED TOUCHING ANY PART OF A SANITARY MANHOLE OR STORM SEWER MANHOLE OR INLET STRUCTURE.
- NEW OR RELOCATED FIRE HYDRANTS WITH UNDERGROUND DRAINS MUST BE AT LEAST 10 FEET FROM ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM" AS DEFINED IN SECTION 381.0065 (2), F.S., AND RULE 64E-6.002, F.A.C. (E.G. SEPTIC TANKS, DRAIN FIELDS, AND GREASE TRAPS).
- THE FOLLOWING ARE ACCEPTABLE ALTERNATIVE CONSTRUCTION VARIANCES WHERE IT IS NOT POSSIBLE TO MEET THE SEPARATION REQUIREMENTS, AND ARE ONLY TO BE IMPLEMENTED UPON RECEIPT OF EXPRESSED WRITTEN CONSENT FROM THE ENGINEER.
  - WHERE A WATER MAIN IS BEING LAID LESS THAN THE REQUIRED MINIMUM HORIZONTAL DISTANCE AND/OR WHERE A WATER MAIN CROSSING HAS LESS THAN THE MINIMUM REQUIRED DISTANCE BETWEEN JOINTS:
    - USE OF PRESSURE RATED PIPE CONFORMING TO AWWA STANDARDS, FOR A GRAVITY OR VACUUM TYPE PIPE LINE.
    - USE OF WELDED, FUSED OR OTHERWISE RESTRAINED JOINTS FOR EITHER PIPE.
    - USE OF WATERTIGHT CASING PIPE OR CONCRETE ENCASUREMENT AT LEAST 4" THICK FOR EITHER PIPE.
  - WHERE A WATER MAIN IS BEING LAID LESS THAN 3 FEET HORIZONTALLY FROM ANOTHER PIPE LINE AND/OR WHERE A WATER MAIN IS BEING LAID WITH LESS THAN THE REQUIRED MINIMUM VERTICAL SEPARATION:
    - USE OF PIPE OR CASING PIPE, HAVING HIGH IMPACT STRENGTH (AT LEAST EQUAL TO 0.25" THICK D.I.P.), OR CONCRETE ENCASUREMENT AT LEAST 4" THICK FOR THE WATER MAIN AND THE OTHER PIPE LINE IF THE OTHER PIPE LINE CONVEYS WASTEWATER OR RECLAIMED WATER.

**MINIMUM HORIZONTAL AND VERTICAL SEPARATION REQUIREMENTS**

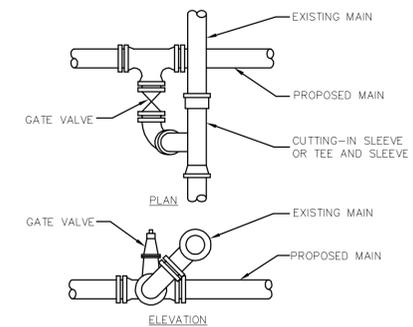
PIPE RESTRAINT FOR PVC PIPE (C-900/C-905 DR 18)											
MINIMUM RESTRAINED LENGTH (FT) - EACH SIDE OF FITTING											
FITTING TYPE	PIPE SIZE - INCHES										
	4	6	8	10	12	14	16	18	20	24	
VERTICAL UP OR HORIZONTAL											
11-1/4 BEND	2	3	4	5	6	7	8	9	10		
22-1/2 BEND	5	6	8	10	12	13	15	16	17	20	
45 BEND	10	13	17	21	24	27	30	33	36	41	
90 BEND	23	32	42	50	58	66	73	80	87	100	
VERTICAL DOWN											
11-1/4 BEND	6	8	10	12	14	16	18	20	22	25	
22-1/2 BEND	11	16	20	24	28	32	36	40	43	50	
45 BEND	23	33	42	51	59	67	75	83	91	105	
90 BEND	56	79	102	122	143	163	182	201	219	253	
BRANCH OF TEE	20	41	63	83	103	129	141	159	177	210	
DEAD END	56	79	102	122	143	163	182	201	219	253	
REDUCERS											
SIZE	6X4	8X4	8X6	10X6	10X8	12X6	12X8	12X10	14X6	14X8	
RESTRL.LENGTH	41	74	43	76	41	106	77	42	133	108	
SIZE	16X6	16X8	16X12	18X8	18X12	18X16	20X12	20X16	24X12	24X16	
RESTRL.LENGTH	159	137	79	163	111	41	141	78	194	142	

- NOTES:**
- SAND-SILT SOIL (COHESIONLESS SOIL WITH 30° INTERNAL FRICTION ANGLE, PIPE FRICTION/SOIL FRICTION RATIO = 0.6, SOIL DENSITY 90 PCF).
  - PIPE LAYING CONDITION 3 (NO SELECT BEDDING OR BACKFILL).
  - 150 PSI DESIGN PRESSURE. FOR 200 PSI DESIGN PRESSURE (FIRE LINES), INCREASE RESTRAINED LENGTH BY 35%.
  - 3 FOOT MINIMUM COVER ON THE PIPE.
  - ALL RESTRAINED JOINT LENGTHS IN FEET.

**PIPE JOINT RESTRAINT TABLE**



**TYPE "B" INTERCONNECTION DETAIL**



**TYPICAL INTERCONNECTION DETAIL**

- NOTES:**
- ALTERNATE TYPE PIPE JOINTS WILL BE APPROVED AS INDICATED IN THE SPECIFICATIONS OR GENERAL NOTES.
  - ALL CONCRETE TO HAVE A 28 DAY COMPRESSION STRENGTH OF NOT LESS THAN 2500 PSI.
  - TYPICAL DETAILS AS SHOWN ON THIS SHEET ARE TO ILLUSTRATE THE ENGINEER'S INTENT IN INSTALLING MAINS AND ARE NOT PRESENTED AS A SOLUTION TO ALL CONSTRUCTION PROBLEMS ENCOUNTERED IN THE FIELD. THE CONTRACTOR MAY ALTER THE METHOD OF CONSTRUCTION TO SUIT FIELD CONDITIONS PROVIDING HE SUBMITS PROPOSED ALTERNATE TO THE ENGINEER AND/OR REGULATORY AGENCY FOR APPROVAL AND MATERIAL USE ARE AS DESIGNATED IN THE SPECIFICATIONS.

No.	REVISIONS	DATE	BY

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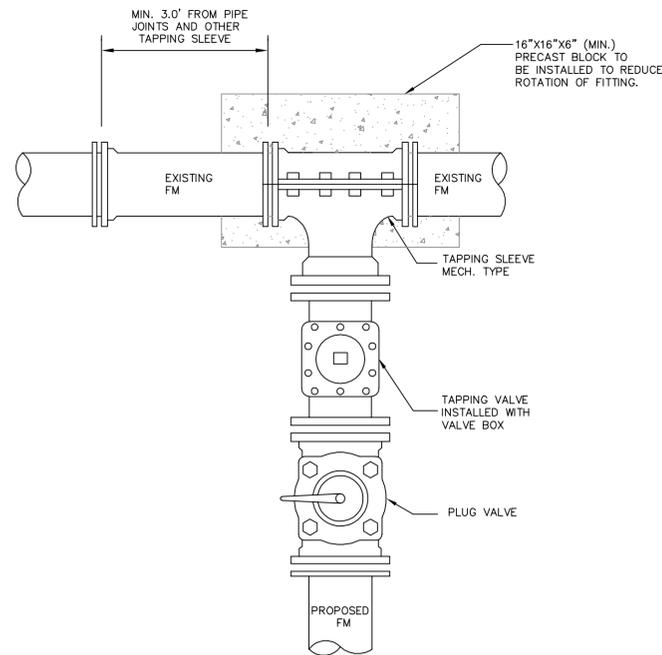
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**STANDARD DETAILS**

SHEET NUMBER  
**10**

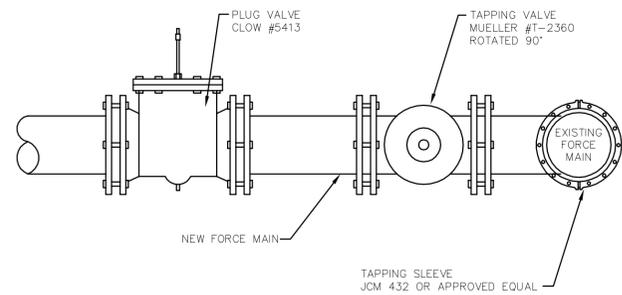
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**NOTES:**

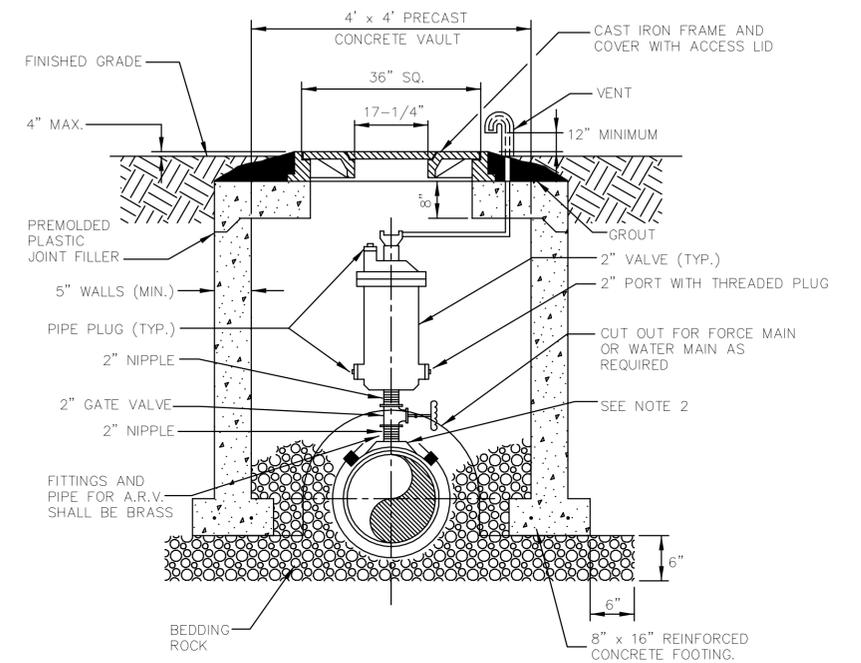
1. EPOXY COATED STEEL, STAINLESS STEEL SLEEVES WITH 316 STAINLESS STEEL BOLTS ARE PERMITTED FOR ALL TYPES OF PIPE MATERIALS.
2. INSTALL REQUIRED RESTRAINED JOINTS. IN NO INSTANCE SHALL THRUST BLOCK BE PERMITTED.

PLAN



ELEVATION

NEW FORCE MAIN TO EXISTING CONNECTION DETAIL



**NOTES:**

1. ABOVE DETAIL IS BASED ON 2" COMBINATION AIR/VACUUM RELEASE VALVE. CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES TO BE DETERMINED BY THE ENGINEER AND APPROVED BY THE UTILITY PRIOR TO INSTALLATION.
2. THE MINIMUM DIMENSION FROM TOP OF PIPE TO FINISHED GRADE SHALL BE 4.0 FEET.
3. IF THE REQUIREMENT FOR AN ABOVE GRADE VENT IS WAIVED BY FDEP, THEN A DOWNTURNED VENT SPOUT MUST BE PLACED INSIDE THE VAULT.

AIR RELIEF VALVE DETAIL

No.	REVISIONS	DATE	BY

**Kimley»Horn**

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KHA PROJECT 149685007
DATE 11/7/16
SCALE AS SHOWN
DESIGNED BY SNR
DRAWN BY JIH
CHECKED BY NEQ

SHADOW HILLS  
LONGWOOD INTERCONNECT

LICENSED PROFESSIONAL
STEPHEN N. ROMANO, P.E.
57579
DATE: _____

STANDARD DETAILS

SHEET NUMBER

11